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Report No. 5587

PROJECT PERFORMANCE AUDIT REPORT

MALDIVES FISHERIES PROJECT

(CREDIT 907-MAL)

April 5, 1985

Operations Evaluation Department

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WEIGHTS AND MEASURES

Metric System

ABBREVIATIONS

BOM	-	Bank of the Maldives
cif	-	cost at port of import
DPW	-	Port Commission of Department of Public Works
DTFI	-	Department for Tourism and Foreign Investment
EEZ	-	Exclusive Economic Zone (200 miles)
FAD	-	Fish Aggregating Device
FAO	-	United Nations Food and Agriculture Organization
GDP	-	Gross Domestic Product
GOM	-	Government of the Maldives
gt	-	gross ton
hp	-	horsepower
IDA	-	International Development Association
IFAD	-	International Fund for Agricultural Development
IFC	-	International Finance Corporation
KFAED	-	Kuwait Fund for Arab Economic Development
LOA	-	length over all
MOA	-	Ministry of Agriculture
MOF	-	Ministry of Fisheries
MPA	-	Ministry of Provincial Affairs
MRC	-	Maintenance and Repair Center
mt	-	metric tons
MTCC	-	Maldives Transport and Contracting Company
OED	-	Operations Evaluation Department
OPEC	-	Organization of Petroleum Exporting Countries
PCC	-	Project Coordinating Committee
PCR	-	Project Completion Report
PPAM	-	Project Performance Audit Memorandum
PPAR	-	Project Performance Audit Report
SAR	-	Staff Appraisal Report
STO	-	State Trading Organization
TDF	-	Treasury Division of the Department of Finance
UNDP	-	United Nations Development Programme
UNCTAD	-	United Nations Conference on Trade and Development

MALDIVES FISCAL YEAR

Calendar Year

COUNTRY EXCHANGE RATES

Name of Currency (Abbreviation)	Maldivian Rufiyaa (Rf)	
	<u>Administrative</u> <u>Exchange Rates</u>	<u>Commercial</u> <u>Exchange Rate</u> (Annex 5 PCR)
Appraisal Year Average	Rf 3.93 = US\$1.00	Rf 7.50 = US\$1.00
Intervention Year Average	Rf 5.47 = US\$1.00	
Completion Year Average	Rf 7.00 = US\$1.00	

**MALDIVES FISHERIES PROJECT
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Map IBRD No. 13994R (PCR) Maldives First Fisheries Project

PROJECT PERFORMANCE AUDIT REPORT

MALDIVES FISHERIES PROJECT
(CREDIT 907-MAL)

PREFACE

This is a performance audit on a fisheries project in the Republic of the Maldives, for which Credit 907-MAL in the amount of US\$3.20 million was approved in May 1979. Project technical assistance was cofinanced by the United Nations Development Programme (UNDP) which provided a grant of US\$280,000. The Credit's original closing date of February 28, 1982 was extended to March 31, 1983. Final disbursements were made on July 28, 1983, and US\$0.72 million was cancelled. A Second Fisheries Project (Fisheries II, Credit 1320-MAL) was approved on January 25, 1983 and became effective on August 31, 1983.

The audit report consists of an audit memorandum prepared by the Operations Evaluation Department (OED) and a Project Completion Report (PCR) dated October 18, 1984, prepared by a fisheries expert from the Bank's Agriculture and Rural Development Department with assistance from the South Asia Projects Department. The Borrower's completion report (available from OED) dated December 12, 1983 was extensively used in the preparation of this PCR. The audit report is based on a review of the Project Appraisal Report No. 2369-MAL dated May 1, 1979, the President's Report (No. 2527-MAL dated May 7, 1979), the Development Credit Agreement (dated June 4, 1979) and the PCR. Project files, including correspondence with the Borrower and internal Bank memoranda on project issues, have been consulted and Bank staff and consultants associated with the project have been interviewed. Documentation related to Fisheries II, the Terminal Report on the UNDP-financed component (included in the PPAR) and OED Report No. 4984 dated March 13, 1984 (Harvesting the Waters - A Review of Bank Experience with Fisheries Development) were also consulted.

An OED mission visited the Maldives in October 1984. The information obtained during the mission was used to test the validity of the conclusions of the PCR.

The audit concurs with the principal findings of this excellent PCR and shares a number of its conclusions. The points discussed in the audit memorandum have been selected because of their importance for this and other Bank-supported projects.

The draft report was sent to the Government and cofinancier for comments on December 20, 1984. Comments received have been fully taken into account and are appended to the audit memorandum.

The valuable assistance provided during the preparation of this report by officials of the Government of the Republic of the Maldives (GOM) and the executing agencies, as well as project beneficiaries visited, is gratefully acknowledged.

PROJECT PERFORMANCE AUDIT REPORT

MALDIVES FISHERIES PROJECT
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BASIC DATA SHEET

KEY PROJECT DATA

	Appraisal Estimate	Actual or Estimated Actual	Actual as % of Appraisal Estimate
Project Costs (US\$ million)	3.88	3.05	79
Credit Amount (US\$ million)	3.20	2.48	77
UNDP Cofinancing (US\$ million)	0.29	0.32	110
Date Physical Components Completed	08/81	10/83 (03/84)/a	
Proportion then completed (%)	100	99	
Economic Rate of Return (%)	101	33	-

CUMULATIVE DISBURSEMENTS

	FY79	FY80	FY81	FY82	FY83
Appraisal Estimate (US\$ million)	1,680	3,200	3,200	-	-
Actual (US\$ million)	-	1,600	2,070	2,170	2,480
Actual as % of Estimate (%)	-	50.0	64.7	67.8	77.5
Date of final disbursement:	July 28, 1983				
Cancelled: US\$0.72 million					

PROJECT DATES

	Original Plan	Actual
Date Negotiations	04/09/79	04/19/79
Date Board Approval	05/29/79	05/22/79
Date Signing	-	06/04/79
Effectiveness Date	09/05/79	08/10/79
Closing Date	02/28/82	03/31/83

MISSION DATA

	Date (mo./yr.)	No. of Persons	Mandays in Field	Specializations Represented/b	Performance Rating /c	Trend/d	Types of Problems/e
Identification	09/77	-	-	-	-	-	-
Preparation	02/78/f	-	-	-	-	-	-
Appraisal	10/78	5	85	E,FS,NA,NE,EN	-	-	-
Re-appraisal							
Supervision 1	07/79	1	4	FS	1	-	-
Supervision 2	02/80	1	6	FS	2	-	-
Supervision 3	07/80	2	10	FS (2)	2	2	M,F
Supervision 4	03/81	1	6	FS	1	1	-
Supervision 5	10/81	1	3	FS	2	2	M,F
Supervision 6	04/82	1	3	FS	2	2	M
Supervision 7	10/82	2	6	FS, NE	2	2	M
Supervision 8	03/83 /g	2	14	FS, NA	1	1	-
Completion							

OTHER PROJECT DATA

Borrower: Republic of the Maldives
Executing Agency: Government of the Republic of the Maldives, Ministry of Fisheries

Follow-on Project /h

Name: Second Fisheries Project (Fisheries II)
Credit Number: Cr. 1320-MAL
Credit Amount: SDR 4.8 million (US\$5.0 million equivalent)/i
Date Board Approval: 01/25/83/j

- /a Date installation last navigational aid (PCR, para. 5.24)
/b E-economist, FS-Fisheries Specialist, NA-Naval Architect, NE-Nautical Engineer, EN-Engineer.
/c 1 - problem-free or minor problems; 2 - moderate problems; and 3 - major problems.
/d 1 - improving; 2 - stationary; and 3 - deteriorating.
/e F - Financial; M - Managerial; T - Technical; P - Political.
/f Identification/preparation undertaken by KFAED-funded consultants.
/g Some missions were joint with either preparation or supervision of second project.
/h SAR No. 4084-MAL dated January 6, 1983.
/i At time of approval.
/j Signed 02/18/83, effective 08/31/83, expected closing date 12/31/89.

PROJECT PERFORMANCE AUDIT REPORT

MALDIVES FISHERIES PROJECT
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HIGHLIGHTS

The project, which had a reestimated economic rate of return (ERR) of 36% at completion, was approved in May 1979, declared effective on August 10, 1979, ahead of schedule, and was to have been completed by August 1981; the closing date was extended to March 31, 1983. Notwithstanding the delay, the project achieved virtually all of its objectives, which were to: (a) increase fish production of the Maldives by providing credit for motorizing pole and line sailing vessels and for increasing the number of engine maintenance and repair centers (MRCs); (b) increase fishermen's efficiency through provision for technical assistance; and (c) improve the safety and efficiency of fishing operations and marine transport by installing navigational aids.

The project credit program for vessel mechanization was highly successful; it was administered well and loan recovery consistently remained at virtually 100%. Engine installation was hampered by limited capacity at the Male boatyards, but proceeded at a regular pace. Demand for engines was high throughout the project period and has continued since project completion.

Installation and operation of the new maintenance and repair centers were substantially delayed, and after completion there was a lack of demand for repair services. Shortages of staff and spare parts were continual problems.

The navigational aids component was expanded after appraisal at the request of the Government and a total of 31 lights were installed under the project, instead of the appraisal target of 12. Light installation was initially delayed but thereafter proceeded well and all lights were installed by March 1984.

The impact of the design and training components of the technical assistance program, which was financed by UNDP and executed by IDA, was beyond expectations. Four "second generation" vessels, which were designed and constructed under the project, were taken up by enterprising local fishermen for trial. The positive experience with these vessels resulted in the setting up of a boat building yard at Raa Atoll to construct 100 vessels of this design under a project financed by the Kuwait Fund for Arab Economic Development (KFAED). The training program benefited a substantial number of fishermen and also succeeded in introducing several technical innovations which have been adopted by many other fishermen.

The success of the project, despite potentially damaging changes in export markets for fish and a virtual collapse of world prices for tuna since 1982, was to a large extent due to strong Government commitment to the project and to the excellent relations that existed throughout between Government, consultants, UNDP and Bank staff. This cooperation enabled the project to establish the basis for an effective and realistic follow-on development of the sector.

Important lessons for the future include:

- (a) project formulation was expeditiously handled by a team containing an appropriate range of technical expertise (PPAM, paras. 16 and 32);
- (b) project design was simple, flexible and relevant to both the needs of the fishing industry and to the management and institutional capability of the implementing agency (PPAM, paras. 16-18);
- (c) the project did not attempt to address the sector's entire investment requirement, but concentrated on aspects of immediate priority and on establishing the groundwork for more far-reaching future investments in the fishing industry (PPAM, paras. 1 and 37, and PCR, paras. 3.01-3.06);
- (d) IDA supervision was good in terms of frequency of missions and of continuity and strong technical content. This contributed to the excellent relationship that developed between IDA and GOM and indirectly to the strengthening of GOM's institutional capability (PPAM, para. 32 and PCR, paras. 7.01-7.05); and
- (e) initial delays in procurement, recruitment of consultants and preparation and clearance of tender documents stemmed from GOM's unfamiliarity with IDA procedures, and might have been partly avoided had a Bank disbursement officer accompanied an early supervision mission to explain matters to the local staff concerned (PPAM, para. 58 and PCR, paras. 5.18 and 7.04).

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(Photographs by Ministry of Fisheries, Male)



Mechanised Fishing Dhonis Delivering Day's Catch to Collector Vessel

MALDIVES



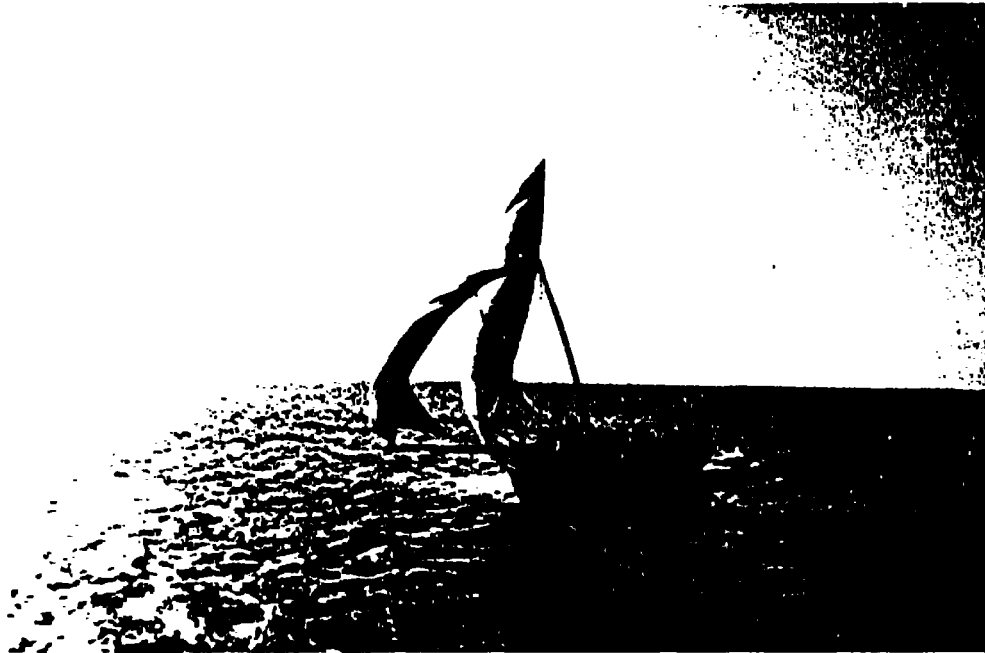
Traditional Sailing Dhow Under Repair at Difuri Island, North Male Atoll



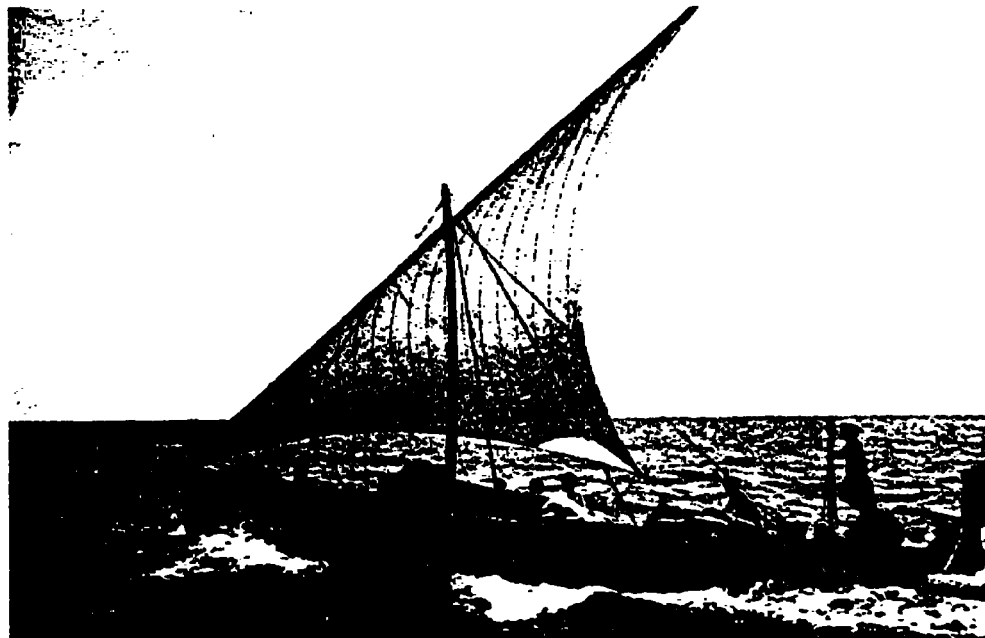
(Photographs by C.E.P. Watson)

Mechanised Dhonis Moored Off the Beach at Difuri Island, North Male Atoll

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Traditional Maldivian Sailing Dhoni Underway



(Photographs by C.E.P. Watson)

Motorised Dhoni Under Power and Sail in Favourable Wind Conditions

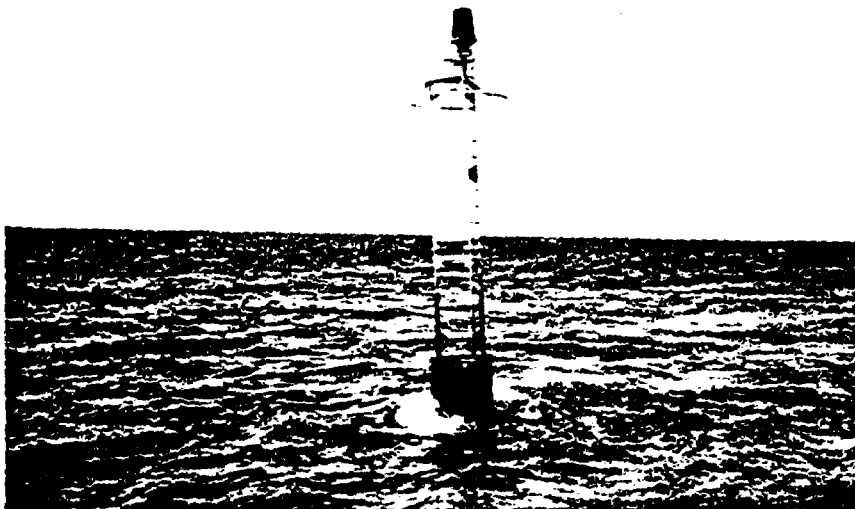
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(Photographs by Ministry of Fisheries, Male)



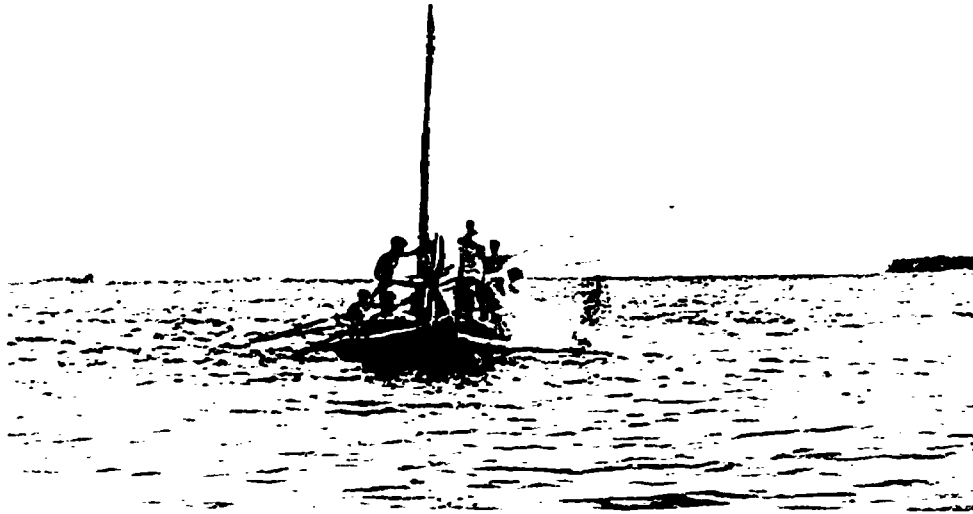
Maintenance and Repair Centre at Thinaadhoo GAAP DHAAAL, Atoll

(Photographs by C.E.P. Watson)

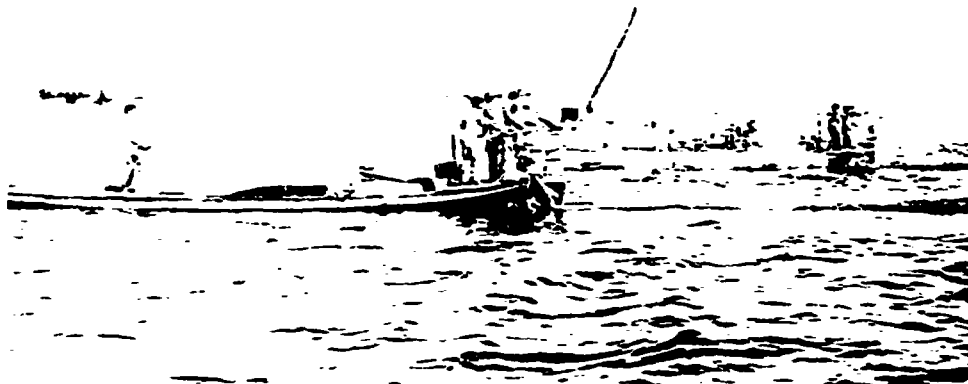


One of the 29 Navigation Light Beacons Provided Under the Project

MALDIVES



TRADITIONAL SAIL DHONI BAIT FISHING



MECHANIZED DHONIS AT FISHING GROUND

PROJECT PERFORMANCE AUDIT MEMORANDUM

MALDIVES FISHERIES PROJECT
(CREDIT 907-MAL)

I. THE SETTING

Introduction

1. In January 1978, the Republic of the Maldives^{1/} became a member of the International Monetary Fund, the World Bank and IDA.^{2/} To date the Bank has undertaken two lending operations in the Maldives, both in the fisheries sector.^{3/} This project was conceptualized as the first of a linked series, which, for the development of the fisheries sector, would give priority attention to the following three objectives:

- (i) strengthen the knowledge of resources and test new technology for fishing methods, vessels and equipment;
- (ii) improve fish production by mechanization of the traditional fishing craft utilizing the existing design to the maximum extent possible; and
- (iii) development of the capability to manage frozen exports of tuna.

As explained in the PCR (paras. 3.01-3.06) the first project focussed on the first two objectives.

^{1/} Throughout its recorded history, the Maldives has managed to remain self-governing, except for one brief spell under Portuguese rule in the 16th century. In 1887, the Maldives became a British protectorate, but there was no British presence in Male. Independence was attained in 1965, and, after a period of experimentation with the institutional reforms, the sultanate was replaced by a Republican Constitution in which a President is nominated by the Citizens' Majlis (House of Representatives) and confirmed in a nationwide referendum. There is universal adult franchise. The executive branch has considerable leverage over the legislature.

^{2/} In February 1983 it became a member of IFC. The first World Bank economic mission visited the Maldives in July 1979 ("The Economy of the Maldives: An Introduction," Report No. 2739-MAL dated April 2, 1980).

^{3/} A Production Promotion and Credit Project, to be executed by the Bank of the Maldives (BOM), is under preparation.

National Setting and Economy ^{4/}

2. The Republic of the Maldives, among the 20 poorest countries, lies between 7°N and 1°S latitude and between 72° and 74°E longitude. It encompasses an archipelago of nearly 1,200 islands in the Indian Ocean, grouped in atolls, forming a long narrow chain over an area of 107,000 km².^{5/} The 19 atolls are surrounded by extensive coral reef systems. Inside the atolls water depths rarely surpass 100 meters; outside the atoll reefs there is a steep dropoff to over 2,000 meters. The climate in the Maldives is tropical and is dominated by two monsoons: the southwest monsoon from May to October, which brings rain and occasional strong winds, and the northeast monsoon from December to April, which brings fair weather.

3. The population of the Maldives, estimated at 160,000 (1982), growing at an annual rate of 2.3%, is scattered thinly over about 200 islands; only 19 islands have more than 1,000 inhabitants. The society has traditionally been small, closely knit, rigidly structured and disciplined, and unified by the common bonds of religion (Islam) and language (Dhivehi, based on Sinbalese, Arabic, and Hindustani). Male, the capital, has over 35,000 people crowded on its 2 km².

4. During 1978-82, rapid development^{6/} of fishing and tourism, as well as the acceleration in public sector investment in infrastructure, led to strong economic growth. Real GDP increased at 12% per year, and per capita at nearly 10% per year. GDP per capita was estimated at US\$346 in 1982. Total employment, between 1979-80, expanded by 3.5% per year, keeping pace with the rate of growth of the labor force. By all economic indicators the Maldives today is clearly better off than it was five years ago. This situation is attributable in large part to the country's sound economic growth strategy, emphasizing an open economy and productive investments in sectors offering comparative advantage: fishing, tourism and shipping.^{7/}

^{4/} Adapted from SAR, Maldives Second Fisheries Project, Report No. 4084-MAL dated January 6, 1983 (hereafter referred to as SAR Fisheries II), and "The Maldives: An Updating Economic Memorandum," Report No. 4445-MAL dated April 11, 1983; subsequently published in white cover as Report No. 4881-MAL, January 1984.

^{5/} The nearest land mass lies about 480 km northeast, the distance to Cape Comorin, India's southern extremity.

^{6/} Tentative earlier Bank estimates for the 1974-78 period also showed an impressive growth (12.5% per annum), attributable to the rapid expansion of the monetized economy in general, the recovery in fishing and the emergence of tourism as a major new sector (see: "The Economy of the Maldives: An Introduction," Report No. 2739-MAL dated April 2, 1980).

^{7/} From "The Maldives: An Updating Economic Memorandum," Report No. 4881-MAL dated January 1984.

5. Fishing remains the dominant sector of the economy (see PPAM, paras. 7-14 and PCR, paras. 2.01-2.06 and 5.02-5.12), but in the past ten years tourism has shown most vigorous growth.^{8/} The share of tourism in GDP grew from 9% in 1978 to about 15% in 1982; fishing contributed 16% in 1982 compared to 22% in 1978. Over this four-year period, the fishing sector grew 22% in nominal terms compared to a four-fold increase for tourism. In 1978 the fishing sector accounted for almost one-half of the employed labor force,^{9/} and nearly all merchandise exports, or 45% of exports of goods and non-factor services. By 1981 fish export earnings had nearly doubled to US\$7.3 million. A drastic decline in negotiated export prices for fresh fish was a major setback in 1982. In that year total fish export earnings (at US\$6.3 million) accounted for about two-thirds of merchandise exports but less than 10% of exports of goods and non-factor services.^{10/}

6. The population of the Male region has been the main beneficiary of the country's rapid income growth; income of people on the other atolls increasingly lags behind. To spread the benefits of economic progress and to moderate the tide of internal migration to the Male region, the Government of the Maldives (GOM) has begun to develop outer atolls. Fishing plays a central role in this strategy, which aims at increasing catch and domestic value added. Compared to other countries, opportunities for employment in sectors other than tourism, transport, fishing and fish processing are few, giving further weight to the future role of the fishing sector.

Fisheries Sector

7. Fishing has been the principal activity of the Maldivian islanders for centuries past, and catches from the fleet of several thousand sailing vessels have averaged in excess of 30,000 metric tons (mt) per annum since the mid-1960s. The bulk of the catch comprises skipjack (Katsuwonus pelamis) and yellow-fin tuna (Thunnus albacares) and in the past most of this was exported to Sri Lanka in the form of a unique dried and smoked product known by the trade as "Maldivian Fish." From 1971 onwards, foreign exchange problems in Sri Lanka and expansion of Sri Lanka's own fishing capability caused this market outlet to dwindle and virtually to disappear by 1978. The progressive loss of the Maldives' only market for its sole export was a major setback and forced the Government to explore and establish other export markets for its tuna production. In order to facilitate that adjustment in 1972 GOM invited foreign companies to start collection of fresh fish for freezing and export to alternative markets. While GOM's long-term objective remains the

^{8/} Although the country is heavily specialized in fishing and tourism, it has, over the last two to three years, made successful efforts to diversify the economy by setting up export-oriented government factories.

^{9/} Available statistics indicate a similar level for 1980.

^{10/} Exports of goods and non-factor services grew from US\$9.1 million in 1979 to US\$68.9 million in 1982; exports of non-factor services grew from US\$5.0 million in 1978 to US\$59.1 million in 1982.

development of local capabilities in these fields, it was recognized that this would not be feasible in the short to medium term. Thus, at the time of appraisal the fishing industry was in transition from a traditional sailing boat-based artisanal fishery to one using more modern methods, necessitated by the need to deliver fish more rapidly from catching grounds to freezing facilities in order to comply with international fish quality standards. It was therefore essential that the fleet became more versatile and efficient and the First Fisheries Project was designed to assist in this transition by accelerating the fishing vessel mechanization and modernization program.

8. Prior to 1978, service facilities for the fishing industry were limited, but by that time Japanese and Iranian aid had funded the beginnings of a motorization program, providing a total of 736 engines, and had also supported the construction and equipping of five engine maintenance and repair centers (MRCs). At appraisal (1978/79) there were no navigational aids (lights, etc.) in the Maldives outside Male Island, which severely hampered fleet operating efficiency by restricting navigation only to daylight hours. At the time of audit, service facilities available to fishermen had been greatly augmented as a result of the injection of a considerable amount of external assistance including IDA's.^{11/} With FAO and OPEC Fund assistance, 11 anchored floating raft-type fish aggregating devices (FADs) were in the process of being installed, earlier trials having proved their worth in increasing vessel catch rates. The number of MRCs has increased to ten, and a total of 29 navigational beacon lights have been installed. The Male boatyards are geared up to continue with vessel mechanization, and a new boatyard on Raa Atoll has increased its capacity to produce new "second generation"^{12/} fishing craft at the rate of six every two months. Additional freezing and cold storage facilities for tuna, more collector vessels and finance for up to 20 new fishing vessels for the northern region and 100 second generation vessels for the southern Maldives are being provided respectively by parallel IDA and KFAED projects as a direct follow-up to the First Fisheries Project. Improved processing and storage facilities for exportable dried fish and provision of dried fish quality control have been established with FAO assistance, and a start made in building up a research capability and improved statistical systems to facilitate more effective management of the fishery in the future. Fuel supplies to the atolls and spare parts supply to MRCs, problematic at times, have substantially improved. Further improvements can be expected as GOM agreed during

^{11/} See PPAM, Table 3, Summary of Technical Assistance to Maldives Fisheries.

^{12/} Under the First Fisheries Project, basically small adaptations were made to existing boats to permit their mechanization: "first generation." However, under the technical assistance component, improved vessels have been designed; while based on experience with existing vessels these are no longer adaptations but construction of new vessels: "second generation" (see also PCR, paras. 5.29-5.31).

negotiations for Fisheries II^{13/} to a diesel fuel price policy which would be consistent with full cost recovery and a reasonable margin of profit.^{14/}

9. Two agencies were primarily responsible for fisheries development at the time of appraisal. The Ministry of Fisheries (MOF) dealt with general fisheries policy and planning, mechanization and catch statistics, while the Department of Tourism and Foreign Investment (DTFI) was responsible for foreign investment in fisheries. Currently, MOF continues to have responsibility for general fisheries policy, administration of fisheries credit, statistics, and planning. The Ministry of Trade and Industries handles negotiations and arrangements with private foreign companies on behalf of GOM (earlier DTFI was responsible for these matters). MOF maintains close coordination with the National Planning Agency and the Maldives Monetary Authority to ensure that fisheries policy conforms to national development objectives. In addition, the state-owned Maldives Fisheries Corporation (now desolved) was carrying out the KFAED project in southern Maldives to expand its fish collection, freezing and exportation activities. This project is now being implemented by the newly formed fisheries projects implementation department of the State Trading Organization (STO). STO is the sole exporter of dried skipjack and also took over the frozen and canned tuna operations of the former Japanese/GOM joint venture (Maldives Nippon Company) when the Japanese partners withdrew in 1982; in addition it is carrying out Fisheries II to expand tuna production and freezing operations in the northern Maldives, based on Felivaru Island.

10. The Maldives fishing industry is still in a state of transition and although prospects for future development and expansion of fish production and export trade are good, there are a number of problems looming on the horizon that require careful consideration during the next stages of the planning process. The First Fisheries Project helped to increase the mechanized components of the pole and line (dhoni) tuna fishing fleet to well over 50% by the end of 1983, and thereby greatly expanded the potential fishing power of the fleet. However, this growth rapidly outstripped the capacity of facilities to collect, process and market frozen tuna, a situation

13/ SAR Fisheries II paras. 5.15-5.16.

14/ Originally, as part of the agreed contract arrangements, fuel was distributed by the collection and marketing companies at Rf 0.60 per liter compared to Rf 1.65 for fuel supplied by STO in Male. This high subsidy, which was entirely born by the companies, caused them to limit fuel supply and restrict distribution to fishermen in relation to their delivered quantity of fish. This issue was not confronted during appraisal of the First Fisheries Project because of the perceived delicate nature of the contractual arrangements that existed between GOM and the companies and only assurances for GOM to ensure adequate fuel supply for the project were negotiated. In the meantime, fuel prices did increase, but a differential pricing system was maintained, a major reason why GOM had to ration fuel to fishermen to prevent resale at higher prices. However, under the Second Fisheries Project these distortions are being removed (see also PCR, paras. 2.04 and 5.09).

which was further exacerbated by the withdrawal in 1982/83 of the foreign participants in the Maldives tuna fishery (PCR, paras. 2.01 and 5.05-5.07). The disinvestment of foreign companies was not so much the result of specific GOM intervention, but more related to changes in corporate strategy aimed at limiting their involvement in tuna production.^{15/} Fisheries II in the northern Maldives and the parallel KFAED-funded project in the southern Maldives are addressing this imbalance by providing additional collection vessels and mother ships and by expanding on-shore plant capacity for freezing and storage of fish ready for export.^{16/}

11. Although there are no estimates of stock size or potential yields for skipjack and yellow-fin tuna within the Maldives' 200-mile Exclusive Economic Zone (EEZ), the resource is known to be very large in the Indian Ocean as a whole. The estimated sustainable yield of Indian Ocean skipjack is about 350,000 mt, whereas current total catches amount to only some 50,000 mt per annum, and in Maldivian waters fishing levels to date^{17/} appear to have had little or no adverse impact on the stocks. Thus, there is no reason why skipjack catches should not be increased to at least the level of 35,000 mt per year as proposed in the context of Fisheries II.

12. The limiting factor at present would seem to be market outlets rather than sustainable yields. An estimated 60% of world production of skipjack and yellow-fin tuna (currently about 1.3 million mt p.a.) is used as raw material in the tuna canning industry. The United States consumes about 65% of the world's canned tuna production and Europe about 25%. In both areas there has been a lack of growth in recent consumption as a result of the international economic recession and in the USA particularly, because of competition from other less costly products. Relative prices between tuna and poultry have now changed in favor of poultry. Furthermore, a few brands still dominate supermarket shelves at prices which are expensive relative to depressed world market prices. Access of overseas brands has been limited so far and they have generally taken advantage of the high prevailing price levels by setting prices at competitive but still relatively high levels.

13. A large buildup of unsold canned tuna stocks caused a near collapse in raw material prices, especially for skipjack, from a 1981 record of over US\$1100/mt cif Japan or USA, to US\$600/mt in November 1982 and as low as

^{15/} From a more detailed description of the worldwide adjustment process to bring catching capacity and consumption to a new equilibrium, see SAR Fisheries II, paras. 1.15-1.18.

^{16/} In addition to these projects, GOM encouraged local investors to set up the privately owned Island Enterprises, a company which operates a number of leased mother vessels; it exports to Thailand and uses its own mother vessels as reefers.

^{17/} In 1980 skipjack catches reached 24,000 mt still well below the record 30,000 mt catch of 1971. Total annual fish landings (all species) averaged 30,000 mt from 1972 to 1983, fluctuating between 25,000 mt in 1972 and 38,000 mt in 1983.

US\$350/mt cif San Diego in October/November 1984. Fortunately, because of the structure of Maldivian fishing operations, which are very cost-effective compared to tuna-catching operations in many other parts of the world, and also because of the abundance of fish and relatively high catch rates, catching costs of tuna in the Maldives are only about US\$225/mt or about one-third of those of more capital-intensive operations in developed countries. Thus, the Maldives fishery has been able, so far, to weather this particular economic storm more successfully than most others, including more powerful nearby countries such as Indonesia and the Philippines.

14. In addition to the issue of oversupply and collapse of skipjack prices in 1982, other matters that impinge on the sustainability of fishing effort and the maintenance of hoped-for expanded fish production in the Maldives are:

- the supply of fuel and spare parts, constrained by foreign exchange shortages, and distribution difficulties to the outer atolls (see also PPAM, paras. 8 and 38 and footnote 14);
- critical future shortages of local coconut palm timber for boat building (see PPAM, paras. 39, 53-55); and
- strains on the limited amount of trained technical and managerial manpower available to MOF and associated fisheries agencies, imposed by the rapid expansion in development activities (see PPAM, paras. 56-57).

These are among the issues discussed in greater detail elsewhere in this report.

II. PROJECT SUMMARY

Background and Project Formulation

15. A reconnaissance mission visited the country in early 1978, and concluded that the fisheries sector would be an appropriate area for Bank Group financial assistance. With technical assistance from a German consultancy firm, financed by the Kuwait Fund for Arab Economic Development (KFAED), the Maldives had already taken steps for preparation of a project to be financed with external resources. The draft preparation report submitted by the consultants recommended mechanization of the traditional fishing vessels, a frozen fish export scheme, development of offshore resources and a substantial technical assistance program (see also PPAM, para. 1 and PCR, paras. 3.01-3.06).

Preparation and Appraisal

16. A mission consisting of a fisheries economist (IDA), and a naval architect, water supply engineer, master fisherman and navigational aids specialist (consultants), visited the Maldives for four weeks during September/October 1978. The mission had the combined task of refining

appropriate parts of the German consultants' preparation report and appraising the resultant project for IDA consideration. Based on the German report, four aspects were seen as requiring priority attention in order to develop the sector:

- (i) studies to improve understanding of the fish resources;
- (ii) mechanization of existing traditional fishing craft (already in process) to increase productivity;
- (iii) evaluation of possible new fishing methods, vessels and equipment to expand and diversify catching operations; and
- (iv) development of the capability to manage exports of frozen tuna.

In addition, the appraisal mission identified the need for navigational aids in the outer islands, to serve both the fisheries and transport sectors.

17. Although detailed knowledge of the fish resources will be needed in due course, available data from sources, including ongoing FAO-supported research, indicated that for some time hence, development of the tuna fisheries in the vicinity of the Maldives would not be limited by resource constraints. It was therefore decided not to include any provision for resource survey work, in favor of concentration on mechanizing and improving the efficiency of the traditional fleet, leading by stages to the possible development of a new, multi-purpose type of fishing vessel which could supply fish directly to the freezing and processing facilities on shore, and so bypass the present system of collector vessels. The need for additional navigational aids in the interests of added safety and more efficient utilization of the fishing fleet was confirmed, as was also the need for studies to develop the basis for future investment in tuna processing and marketing infrastructure.

18. During appraisal it was realized that there would be need for a considerable amount of technical assistance to further improve mechanized fishing operations and fishermen's skills. UNDP expressed interest in contributing and later agreed to finance a technical assistance component with IDA as executing agency. The component included a training program for fishermen whose vessels were being mechanized; detailed design of possible improvements to existing vessels; design of a "second generation" pole and line fishing vessel and the construction of five prototypes for testing; design and construction of a multi-purpose fishing vessel having longer range and the ability to hold fish on ice in insulated holds, so permitting fishing trips of 3-4 days' duration; and finally, a feasibility study for a follow-on fish collection, marketing and fuel distribution project.

19. Final appraisal work of the project was undertaken in Washington during December 1978 and January 1979. The Yellow Cover draft appraisal report was distributed on February 6, 1979, followed by the Green Cover on March 2, 1979 and, following negotiations, the final report was issued on May 1, 1979.

Negotiations and Approval

20. Negotiations were held in Washington during April 5-9, 1979. As indicated in the Minutes there were no matters of contention, and agreement was reached on all points, including the principal covenants.

21. A condition of effectiveness was that a Project Coordinating Committee, which should include representation from all the Maldivian departments and agencies impinging on the project, be established by GOM. Other important conditions covered GOM financing of local cost components and the need to ensure adequate supplies of fuel for purposes of the project. Board approval was given on May 22, 1979, the agreements signed June 4, 1979 and declared effective on August 10, 1979, a month ahead of schedule.

22. The project as approved (see also PCR, para. 4.01) had the dual objectives of expanding fish production by increasing efficiency through motorization and improving the safety of fishing operations and marine transport, and contained the following components:

- (i) credit for motorization of 500 sailing vessels;
- (ii) construction and operation of 5 MRCs;
- (iii) navigational aids;
- (iv) consultancy services for procurement; and
- (v) UNDP-financed technical assistance and training.

Project Implementation

23. The Credit Agreement was signed on May 22, 1979, and the credit declared effective on August 10, 1979; it was to have been completed by August 1981 but the Closing Date was extended to March 31, 1983.^{18/} Project implementation did not give rise to major issues, except for some delays. However, it should be noted that the project was implemented in a rapidly changing sectoral environment which affected the financial, economic and social impact of the project. This is extensively discussed in the PCR (paras. 5.02-5.12). As a result, the fishing communities experienced probably more technological and social change over the last decade than in the previous centuries (PCR, para. 7.05). Despite these changes and delays, the project achieved virtually all of its objectives, because of timely and effective GOM management. GOM's evolving fisheries policies could generally be described as supportive rather than interventionist.

^{18/} Final disbursements were made on July 28, 1983 and the remaining balance of US\$0.72 million was cancelled. All but a few navigational aids were installed by November 1983; the last light was installed on March 10, 1984 (PCR, para. 5.24).

24. The project credit program for vessel mechanization was highly successful. Under its earlier mechanization program GOM did not charge any interest on its loans. Under the project, subloans were given for eight years without grace at 9% interest. While lower than commercial loans at the time, this began to introduce some measure of rational resource allocation (PCR, paras. 4.09 and 5.20). The Government also agreed not to execute any other mechanization schedules in such a way as to impair execution of the IDA project.^{19/} The credit program was administered well and loan recovery was close to 100% (PPAM, para. 28). Although installation of engines at times was hampered by the limited installation capacity of the boatyards in Male, mechanization proceeded at a regular pace. Demand for engines was high throughout project implementation, and continued after the project was completed. Construction and operation of MRCs was the least successful part of the project. Construction was substantially delayed, in part due to contractual problems and after completion suffered from lack of demand for repair services and shortages of staff. The navigational aids component was expanded after appraisal at the request of GOM. Following the findings of a project-financed survey on the location of lights, a total of 31 lights (instead of the appraisal estimate of 12) were installed under the project. Light installation, after initial delays, proceeded well and all lights were installed by March 1984. The impact of the technical assistance components was quite effective. The training program not only trained a substantial number of fishermen, it succeeded also in introducing several technical innovations which since have been applied by many other fishermen. Perhaps most importantly, the project established the foundation for an effective and realistic development of the sector.

25. Four of the "second generation" vessels which were designed and constructed under the project were taken up by enterprising fishermen for test fishing operations.^{20/} The positive experience with these vessels resulted in the setting up of boat building yard at Raa Atoll to construct 100 vessels of this design by a credit program funded by KFAED.

Project Administration

26. General responsibility for project implementation was vested in the Project Coordinating Committee (PCC) which was established as a condition of effectiveness and which included representation from most of the ministries, departments and other agencies concerned with the project. The PCC met regularly and performed a very effective role in monitoring and coordinating project activities.

^{19/} As a matter of interest, under Fisheries II, about 85% of the IDA credit, IFAD loan and Norwegian Government grant is being onlent (under a subsidiary agreement) to the executing agency, STO, for 15 years with 5 years grace and at 13% interest.

^{20/} GOM comments that a shortcoming of this report is that there is no mention of the long range vessel (see Appendix 1). However, this was part of the technical assistance component which is covered in extenso in PCR, Chapter 5, C (see also PCR, paras. 4.07 and 5.31 and UNDP Terminal Report, paras. 2.17 and 4.02).

27. Day-by-day conduct of project activities was undertaken by MOF, which was responsible for administering and supervising the credit program for fishing vessel mechanization (PCR, paras. 5.19-5.20). A Fisheries Project Division was established within MOF for this purpose and despite the general staff shortage, allocation of staff resources was adequate for project needs. Project management was flexible and effective and all the Government staff concerned were fully committed to project objectives, and so contributed greatly to the project's successful outcome. A revised MOF organization chart is appended to the PPAM (Annex 1).

28. Administration of the credit program was with a virtual 100% recovery rate - highly satisfactory. This was certainly made easier by the traditional interdependence of small island communities, the excellent system of inter-island radio communications and full cooperation of atoll administrative staff (see also PCR, para. 5.20). Nevertheless, improvements to the scheme could be suggested because all payments to date have to be made in Male, and to avoid having to travel there on each occasion boat owners had to make arrangements for other people--perhaps relatives living in Male--to make the payments on their behalf. Given the good system of radio communications, there seems no reason why payments could not be made to the office of the atoll chief concerned and the amount and receipt number concerned reported to Male by radio.^{21/} A good feature of the scheme, however, was its flexibility whereby a boat owner could pay a larger sum than that actually due during a good fishing season and lesser amounts at other times, so long as at any time he had repaid not less than the total due by then under his credit agreement. In fact, many beneficiaries repaid their loans in full, in advance of the due date because this absolved them from having to comply with the restricted vessel use clause.^{22/}

29. The vessel mechanization program suffered from initial delays because of limited capacity at the boatyards. Matters improved considerably as the project progressed and all 500 engines were installed by July 1983, only six months later than the planned date.

30. Construction and operation of the five MRCs presented a number of delays and operational difficulties, caused by initial land acquisition problems, contractual problems with some of the building contractors and finally, difficulty in maintaining adequate spare parts supply and retaining the services of experienced mechanics who could obtain more highly paid employment in Male. Construction was not completed until September 1982, more than a year late. The difficulties over staffing and spare parts supply have still not been completely overcome, but have been alleviated to some extent.

^{21/} GOM comments that radio communication is not always so good (see PPAM, Appendix 1).

^{22/} Under the Loan Agreement with MOF, they agreed to use their vessels for four years, predominantly for fishing operations.

31. The time needed to install the navigation aids component was unavoidably extended following agreement in mid-project to increase the number of light beacons from 12 to 31. Staff of the Ministry of Transportation and MOF were trained by a supplier's factory technician to install and maintain the lights, and all were installed and in operation by mid-March 1984. The Ministry of Transport took over responsibility for light maintenance in 1981. The positions of all the lights have been verified and notified to the Admiralty Hydrographers Office in the United Kingdom for inclusion in updated navigation charts. The audit mission was advised that regular maintenance is being carried out satisfactorily, but in the event of a light malfunction between scheduled maintenance visits the response time to effect repairs can take up to one month.

32. While project success stemmed in large measure from the strong commitment of GOM to the timely achievement of project objectives, effective project management and consultant services of high quality also contributed. Furthermore, IDA's performance was also good. Project formulation was by a team possessing an appropriate range of technical expertise, and the continuity of supervision staff having technical expertise in fisheries development undoubtedly also contributed to the project outcome and to the excellent relationship that developed between GOM and IDA. The views expressed in the PCR (paras. 7.01-7.05) regarding performance of IDA and the Borrower are fully endorsed by the audit. Beyond that, this experience clearly demonstrates that, notwithstanding the many problems that may be expected in small-scale fisheries development, a technically sound project plan, ably administered and professionally supervised, can produce a very satisfactory and successful outcome.^{23/}

Impact and Sustainability

33. The impact of the project has been substantial, both in quantifiable economic terms and in other ways. As can be seen from the analysis of catch and fishing effort data (PPAM, Table 2), a mechanized pole and line fishing dhoni, simply by virtue of its ability to travel more rapidly to and from the fishing grounds can spend more time catching fish than can the sailing vessel. This is reflected in the figures of average catch per fishing day which, for mechanized craft, are between two and three times greater than for sailing vessels, more than offsetting the additional operating costs for fuel and engine maintenance, etc.

34. The number of mechanized pole and line craft has increased during the project period from 777, or 38% of the total registered pole and line fleet in August 1979,^{24/} to 1231, or 60% of the pole and line fleet at the end of 1983. In the meantime, a number of older sailing dhonis have dropped out of service and some mechanized vessels have been diverted from fishing to

^{23/} For a fuller accounting of experience with fisheries projects, see "Harvesting the Waters: A Review of Bank experience with Fisheries Development," OED Report No. 4984 dated March 13, 1984.

^{24/} As recorded in the First Fisheries Project SAR (Annex 2, Table 1).

serving the tourist industry, but the overall fishing power of the remaining smaller fleet is nevertheless more than 17% greater than it was in 1979.

35. Once the improved collection and processing facilities being provided under Fisheries II and the parallel KFAED project come on stream and so enable both components of the fishing fleet to increase the number of fishing days per year, the benefits in terms of increased total catch and earnings from export sales will be considerable. Benefits derived from some of the other project components are less easy to measure, and undoubtedly the MRCs have had less impact than expected because of organizational and staffing difficulties and because many dhoni owners appear to prefer to take their vessels to Male for repair and engine servicing. The benefits of the navigational aids component are long-term and likely to become more apparent in the future when night-time navigation can be expected to be more widely practiced than at present. During the audit mission it was reported that a few of the reef marker buoys had apparently dragged their moorings and had been either swept away or sunk, but they should be quite easy to replace.

36. As described in the PCR (paras. 5.25-5.33), the impact of the design and training activities of the technical assistance components was beyond expectation. The prototype "second generation" boats proved extremely popular and led to the establishment of a new boat building facility on Raa Atoll and to the funding of an additional 120 vessels of this class under Fisheries II and the KFAED project. The fishermen's training component was also successful in introducing a number of simple but valuable technical innovations which are being applied by a number of fishermen.

37. As regards sustainability, the project laid the groundwork for more substantial and far-reaching development investments in the fishing industry and in particular helped to generate a sense of greater confidence in MOF as to its ability to manage the industry and promote its expansion. However, the near collapse in world skipjack prices since 1982 casts a shadow and has certainly had an adverse effect on fishing industry earnings, but as described in PPAM, para. 13, because of its cost effective structure,^{25/} the Maldivian industry has been able to weather this storm more successfully than many other countries.

38. The supply of fuel and spare parts has been constrained in the past by distribution difficulties to the outer atolls by foreign exchange shortages and price distortions. Continuation of these difficulties would clearly have had an adverse effect upon project sustainability, but substantial improvements have been made (PPAM, paras. 8 and 14). The audit confirms that MOF is acutely aware of these problems, and is doing everything possible to resolve them. This is further reinforced by activities and policy changes supported by Fisheries II.

39. Among the matters discussed later under Project Issues, there are two that bear upon sustainability. The first relates to critical future shortages of local coconut palm timber for boat building (the traditional

^{25/} See also SAR Fisheries II, paras. 1.15-1.18.

material used in the Maldives), because of excessive tree felling. As the production of nuts is no longer sufficient to meet local demand, MOA is on the point of issuing a prohibition on further coconut timber extraction from Government-owned plantations until such time as the replanting programs now in hand can restore the situation. Unless substitutes are available, this is likely to present major problems to boat owners who wish to replace old and worn-out boats. Given that the existing fleet of all types of fishing craft (see PPAM, Table 1) totals in excess of 5,000 vessels, and that a local boat is expected to last for 15-20 years, the annual replacement rate must be between 250-330 new boats per year, and local timber shortage could therefore lead to a substantial reduction in total fleet size over the next few years unless arrangements are made for the importation of such timber^{26/} (see also PPAM, paras. 47-48 and 53-55).

40. The second topic concerns staffing of MOF and the other fisheries agencies, where the limited numbers of trained technical and managerial staff are already under severe stress consequent to the rapid expansion of development activities. The PPAM (Table 3) provides a list of projects in the present fisheries sector financial and technical assistance program, from which it can readily be seen that overloading could well cause a decline in management standards and project performance in the future.

Follow-on Project^{27/}

41. GOM and IDA held a continuing dialogue on fishery policy and future IDA financing during supervision of the First Fisheries Project. IDA assisted GOM in identifying the proposed second project during August 1980. The project was prepared in September 1981 with the assistance of an IDA mission, with funds provided by UNDP under the First Project Technical Assistance Component. Credit 1320-MAL in the amount of US\$5.0 million was approved by the Board on January 25, 1983^{28/} and the project was declared effective on August 30, 1983. The State Trading Organization (STO) is the executing agency.

^{26/} For that reason the "second generation" boats now being built under Fisheries II and the KFAED project were specifically designed for imported hardwood instead of palm timber.

^{27/} From SAR, Fisheries II, paras. 4.01-4.04.

^{28/} During Board discussions the principal point discussed concerned fish pricing policy. As STO would largely determine prices, the Board was concerned that the system might ignore or filter out important market signals. It was explained that Government intervention to protect fishermen and its source of foreign exchange was necessitated by the near collapse in world tuna prices since 1982. Provided that world prices recovered there would be further changes to the Maldives pricing system in the direction of allowing market signals to set prevailing prices. There was also some discussion about the "sunk cost" of existing vessels, which seems to be an unfortunate choice of expression in the context of a still floating fishing fleet.

42. Details of the project's objectives and its various components are provided in PPAM Annex 2, but in essence, the project aims to expand fisheries sector infrastructure in the northern Maldives, to assist in expanding frozen fish exports and to strengthen the diesel fuel distribution system. Experience with project implementation to date shows there have been substantial delays in negotiations between GOM and the consultants in charge of design work, the difficulties centering around the added cost of additional work. This is regarded as the biggest obstacle to timely implementation so far. The management contract was delayed but has now been completed. Bidding documents are about to be published and it is anticipated that progress will improve from now on.

III. PROJECT ISSUES

A. Fishing Methods

43. Over 90% of the tuna catch in the Maldives is taken by vessels using the pole and line, live bait method. Few, if any of the vessels currently carry ice, so catches have to be landed daily. A typical day starts shortly before dawn when the boats go to catch bait near reef areas, using a form of lift net. The bait fish are kept alive in a flooded bait well inside the boat. Once sufficient bait has been caught, the vessel proceeds up to 25 km to seaward, to positions where experience indicates the likely presence of tuna schools. Once a school is sighted it is approached and live bait is tossed into the water to attract and hold the tuna in close proximity to the boat. The tuna are then caught by up to eight fishermen who each use a pole to which is attached a short fixed line (no reel) ending with an artificial lure and barbless hook as gear. The vessels return to shore with their catches, or rendezvous with a collector boat, in the early evening.

44. During the fishermen's training part of the UNDP-funded technical assistance component of the First Project, consultants from Hawaii, where there is a similar fishery, introduced a number of minor but nevertheless valuable technical improvements to the Maldivian fishing system. These included the use of a hollow bamboo tube inserted through a hole in the bottom of the vessel to control the level of sea water in the bait well, and at the same time improve the water flow rate through the bait well, which is essential to keep the bait fish alive. They also introduced a new lure and hook which seems to perform better than the traditional variety and which could be fabricated locally. Such improvements were welcomed by the Maldivian fishermen and have been adopted by many of them.

45. With FAO, OPEC Fund and UN Emergency Fund (through UNDP) assistance a number of "payo" or fish aggregating devices (FADs) are being introduced and these are useful in reducing the time that otherwise has to be spent in searching for schools and can therefore result in substantial savings in fuel costs. In most other respects, however, the Maldivian pole and line technology is about as good as it can be made to be. In other countries where pole and line fishing is also carried out, the vessels are equipped

with a high pressure water pump to spray jets of water over the side during tuna catching operations (this serves to delude the tuna as to the amount of bait and also camouflages the fishing vessel, so that the school can be held in a state of feeding frenzy alongside the vessel for a longer time and so increase catch rates). Unfortunately the Maldivian vessels are too small and have insufficient power for this technique to be a practical possibility.

46. One improvement that may be possible, at least in some parts of the northern and southern Maldives is that live-bait catching could be handled as a separate full time function, using different boats, and the captured bait fish could be stocked into conveniently located netted enclosures. Pole and line boats could then purchase their bait supplies from these enclosures and save much time in the process, enabling them to spend even more time each day on the tuna fishing grounds. However, the marked seasonality of both bait fish and tuna schools in other parts of the Maldives precludes the general adoption of such an approach. Again, in other parts of the world, bait fishing is carried out at night, using lights to attract and concentrate the fish, but there appears to be a strong and widespread superstition in the Maldives against such an idea, at least at this time.

B. Fishing Fleet Utilization

47. Prior to 1972, the pole and line fleet were all sail driven, but in that year the first vessel was successfully mechanized and since then, with Japanese, Iranian and IDA assistance, more than 1,230 vessels, or 60% of the pole and line fleet have been equipped with inboard diesel engines. In addition Fisheries II and the KFAED project have provided for up to 120 new pole and line vessels of the improved "second generation" class. Thus, by the end of 1985 there will be upward of 1,500 mechanized tuna catchers in Maldivian waters. Catch rates vary considerably, both seasonally and geographically, as a result of tuna and bait fish migrations. One of the "second generation" boats achieved a record catch in December 1980 of over 7,000 fish, or 15 mt in a single day, but such high catches are unusual, and the average, as indicated in PPAM Table 2, for a mechanized dhoni is about 300 kg per fishing day, which is nearly three times the average daily catch of a sailing dhoni. Vessel utilization is of greater significance and, as can also be seen from PPAM Table 2, the mechanized pole and line boats average only about 100 fishing days per year at present. This is caused partly by seasonal variations in fish abundance, but also by periodic shortages of fuel and the inadequacy of fish collection and processing facilities hitherto. Both of these constraints are being addressed under Fisheries II and the KFAED project, so one could expect a progressive increase in fishing vessel utilization in the next few years.

48. However, on the basis of current utilization rates, 1,500 vessels catching 300 kg per day for 100 days per year could produce 45,000 mt. Even if, as some observers believe, as many as a third of the mechanized dhonis are in semi-permanent use for transportation, production would still be nearly equivalent to present total fish landings. The impact of mechanization on catches is such that it needs careful attention. On the other hand fishing levels to date seem to have had little impact on the resource (PPAM,

paras. 11 and 17), although there is limited knowledge on the resource. Thus, there is a dilemma: either the resource base is large enough to accommodate increased catch levels or it is not. In both cases this has implications for the mechanization program and optimum fleet size, which in turn could have serious implications for employment in the Maldives in the future. In the audit's view and as also noted in the latest Bank economic report,^{29/} further study of these issues is urgently required.

C. Diversion of Fisheries Investment

49. As noted in the PCR (paras. 5.11 and 5.12), a number of mechanized fishing vessels, including some that were mechanized under the project, have been diverted from fishing and modified to serve the needs of the tourist industry; other vessels have been used for transportation of goods and passengers between islands. This clearly shows that vessel owners will use their assets where they can obtain the best return on their investment.

50. The rapid growth of tourism from one resort in 1972 to over 50 in 1984, rapidly outstripped the capacity of the regular transport fleet. The resorts are located on islands north and south of Male and tourists arriving by air have to be transported by boat from the airport to the particular resort island. The resorts also have to depend on sea transport for all their food, fuel and other supplies, thus until recently there was a substantial opportunity for mechanized vessel owners to convert their vessels to use in resort trade. The boat mechanization sub-loan agreements stipulated that for a minimum period of two years, vessels should not be used for income earning purposes other than fishing. This period usually varied up to eight years depending on the date the fuel amount due was paid but this obligation ceased as soon as the amount due was paid off after four years. A number of owners did in fact accelerate their repayments, and some might have done so with assistance from one or another of the resorts. However, to a large extent this might have been temporary diversion. The standard fishing vessel is not ideally suited to tourist transportation, being relatively small, and in the meantime a number of the resorts have had their own, much larger

^{29/} "Another issue which needs to be addressed soon is the absence of a systematic Maldivian fisheries stock research and resources survey. At present, the main resource areas utilized in the Maldives are the tuna and mackerel surface waters in the inter-atoll basin and waters outside the atolls up to 25 km seaward, leaving the mid- and bottom waters of these areas unexploited, and also leaving the oceanic waters (beyond 25 km seaward) and the reef waters unexploited or lightly exploited. While fishing in oceanic waters would be capital intensive, the subsurface of the inter-atoll basin, and the reef waters, could be exploited economically if there were adequate stock surveys and research. From occasional light catches, it is thought that the reef waters contain many valuable species (barracuda, seer, wahoo, rock cod, snappers, spiny lobsters). The assessment of these stocks, and of sustainable economic yields, and assessment of shrimp resources have been proposed and should be undertaken." The Maldives: An Updating Economic Memorandum, Report No. 4881-MAL dated January 1984 (para. 54).

vessels built, providing more covered space and comfort for passenger carrying. It was suggested to the audit mission that a number of the fishing vessels converted have already reverted back to fishing.

51. The use of fishing vessels for inter-island transport of goods and passengers is, as pointed out (PCR, para. 5.11), a time-honored and traditional activity which enabled boat owners to obtain some return from their investment during slack fishing seasons when the vessel would otherwise be idle. Since the start of mechanization it seems that some vessels may have been used virtually full-time on inter-island transportation, although no figures are available on the numbers of vessels so affected. This undoubtedly reflects attractive opportunities in inter-island trade as inter-island transport remains an important constraint for economic integration and development. However, opportunities might in fact be limited. A recent UNCTAD report,^{30/} which was reviewed by the audit mission while in Male, noted that the 1985 tonnage forecast for Male to the atolls is 20,087 tons, and that a single mechanized dhoni could move 90 tons per annum in one direction when used full-time. Thus, 251 dhonis could satisfy the entire national transport requirement. Competition from vessel owners wanting cargos during fishing off-seasons is such that freight rates could be very low and not provide much scope for full-time diversion to inter-island trade. Furthermore, the forthcoming improvements in fish collection and processing should improve the economics of the fishing effort, making this again relatively more attractive.

52. The point is that diversion is an economic phenomenon reflecting higher value alternative opportunities for vessel utilization. In the case of a large inter-island nation it is only to be expected that vessel diversion from fisheries to other opportunities and back again will be a continuous process. While the economics of such diversion have not been captured in the project's rate of return calculation, they present real financial benefits for the boat owners. Luckily, project activities and policies did not attempt to forcefully restrain such developments.

D. Timber Supply for Boat Building

53. Audit inquiries at MOA in Male confirmed that a critical shortage of coconut palm timber was imminent. This is the material traditionally used for boat building in the Maldives, presumably for want of any other suitable material on the islands, but interestingly the boats so constructed have a life expectancy of 15-20 years, which is much longer than that of many boats built in other countries, e.g., the Philippines, from more conventional hardwoods. While knowledge in the Maldives is very advanced, with a dozen or more grades of palm trunks recognized for various purposes, there appears, unfortunately, to be little or no technical information available outside the Maldives on the particular qualities of palm timber which impart this durability. It would be an interesting subject for codification and/or publication for possible application elsewhere.

^{30/} "Domestic Transportation Study for Republic of Maldives," UNCTAD Report RAS/77/028 dated June 1984.

54. In the meantime, according to MOA information, GOM has been charging a royalty of only Rf 1.00 per palm trunk felled (replanting was also required, but this was done in a very haphazard fashion), compared with up to Rf 200.00 charged by a private owner selling his trees. A substantial area is known to have been cleared and not yet replanted over the past few years, though actual hectareage could not be specified. Nut production in many islands is no longer sufficient for local food needs. The Government is therefore considering imposing a total ban on any further extraction, other than from privately owned plantations, until such time as replanting has sufficiently advanced to rebuild surplus nut production.

55. This will inevitably lead to an acute shortage and sharp rise in the price of local timber and a rapid increase in demand for imported timber, limited only by foreign exchange constraints. The effect on the fishing fleet could be drastic, both in terms of the restricted numbers of vessels that can be built and on the costs of construction. Imports could substitute but, given limited other opportunities in agriculture, accelerating the rate of replanting coconuts receives high priority. To some extent this will be covered under the envisaged IDA Production Promotion and Credit Project (under preparation).^{31/}

E. Institutional Constraints

56. The resources of trained technical and managerial staff available to MOF and associated agencies concerned with the fishing industry, e.g., STO, are now under acute strain as a result of the many fisheries development projects that have come on-stream in the last two years or so (see PPAM, Table 3). Much of this expansion stems from the successful implementation and outcome of IDA's First Fisheries Project, but is now in danger of overloading present institutional capacity to the point of collapse.

57. Although some of the new projects concern education and training in various aspects of fisheries work, they may take some years to produce results and in the meantime, it is only right to point out that the First Project's successful record should not be taken as a guarantee that follow-up work can be handled as efficiently and expeditiously. The need for technical assistance to reinforce local institutional capacity will be very great for some years to come.

F. Disbursement Delays

58. It was also noted in this case that there were substantial initial delays in disbursements. Identical situations have been observed in other

^{31/} The Production Promotion and Credit Project aims "to develop agricultural and agribusiness sectors through strengthening the development banking functions of the Bank of the Maldives (BOM). Key components financed under the project would be: vegetable, fruit, coconut, palmwood and firewood production, animal industry, cottage industries and transport vessels, along with technical assistance" (Monthly Operational Summary of Bank and IDA Proposed Projects, SECM 85-294 dated March 20, 1985).

cases.^{32/} It would seem that explanations of IDA procedures which are given during negotiations and the instruction manuals concerned are either not adequate or, more likely, not given to the people who are ultimately responsible for preparing disbursement requests. While a Disbursement Division representative ultimately visited the Maldives, it would have been more opportune if such visit could have been arranged much earlier. This would have ensured that staff concerned with project implementation would have been fully conversant with IDA requirements from the beginning and also that the Disbursement Division was properly briefed on any unusual features of the local system of financial management. The audit recommends that in all cases, except clear follow-up or subsequent projects to the same executing agency, a Disbursement Division representative should accompany the earliest supervision mission possible, as a matter of standard procedure.

G. Effect of Mechanization on Fishing Sector Employment

59. In many countries one effect of the mechanization of previously manual or wind propelled traditional fishing craft has been to reduce the number of crew members per vessel, and in some cases this had led to a substantial decline in fishing sector employment. However, in the case of the Maldives pole and line tuna fishing fleet the effect has been minimal so far, because the fishing method is itself highly labor intensive, irrespective of the type of vessel propulsion. Thus, whereas a large sailing pole and line vessel carries a crew of up to 13 men, the same vessel after mechanization would still require at least 12 men. According to Ministry of Fishing statistics (see Table 1) the fishing labor force has fluctuated between 24,000 and 22,000 with a slightly declining trend between 1980 and 1983. This trend may be reversed as new jobs are created by the additional new vessels being constructed under the IDA and KFAED projects. On the other hand diversion (PPAM, paras. 49-52) and similar shortages (PPAM, paras. 53-55) could adversely affect employment.

^{32/} See PPAR, Burundi - Fisheries Project (Credit 626-BU), OED Report under preparation.

PROJECT PERFORMANCE AUDIT REPORT

MALDIVES FISHERIES PROJECT
(CREDIT 907-MAL)

SUMMARY OF FISHERIES STATISTICS, 1980-83

	1980	1981	1982	1983
Fish Landings Total ('000 mt)	34,691	34,900	30,300	38,559
Of Which Tuna Species	30,439	29,400	23,200	31,569
Total Registered Fleet	5,524	5,395	5,305	5,490
Of Which: Mechanized dhonis	805	970	925	1,231
Sailing dhonis	1,314	1,061	952	811
Trolling (Vadhudhonis)	3,405	3,364	3,428	3,448
Number of Fishermen	24,330	22,301	21,727	22,262
Total Sector Employment (Estimated)	29,200	27,200	26,600	27,100
Fish Exports ('000 mt)	16,960	15,825	12,090	10,127
Of Which: Fresh/Frozen	14,100	13,791	9,789	7,853
Dried/Smoked/Salted (dry weight)	2,860	2,034	2,283	2,231
Canned	-	-	17.8	43.4

Source: Ministry of Fisheries, Male.

PROJECT PERFORMANCE AUDIT REPORT

MALDIVES FISHERIES PROJECT
(CREDIT 9 07-MAL)

ANALYSIS OF CATCH AND FISHING EFFORT, 1980-83

	1980	1981	1982	1983
Number of Mechanized dhoni	805	970	1,166	1,304
Fishing Days — Total for Mechanized Fleet	82,883	82,437	94,294	117,172
Total catch by Mechanized Fleet (mt)	27,056	(*)	23,000	31,759
Average Fishing Days per Boat	103	85	102	95
Number of Sailing dhoni	1,314	1,061	952	811
Fishing Days — Total for Sailing dhoni	16,747	13,852	10,036	6,339
Total catch by Sailing dhoni (mt)	2,520	(*)	950	650
Average Fishing Days per Boat	13	13	10	8
Number of Trolling Vessels (Vadhudhoni)	3,405	3,364	3,428	3,448
Fishing Days	136,700	148,105	133,053	118,639
Total Catch by Trolling vessels (mt)	5,115	(*)	6,350	6,150
Average Fishing Days per Boat	40	44	39	34
Catch per Fishing Day — Mechanized Vessels (kg)	326	(*)	244	271
— Sailing Vessels (kg)	150	(*)	95	102
— Trolling Vessels (kg)	37	(*)	48	52

Source: Ministry of Fisheries, Male.

(Note: (*) Catch breakdown by vessel type not available for 1981).

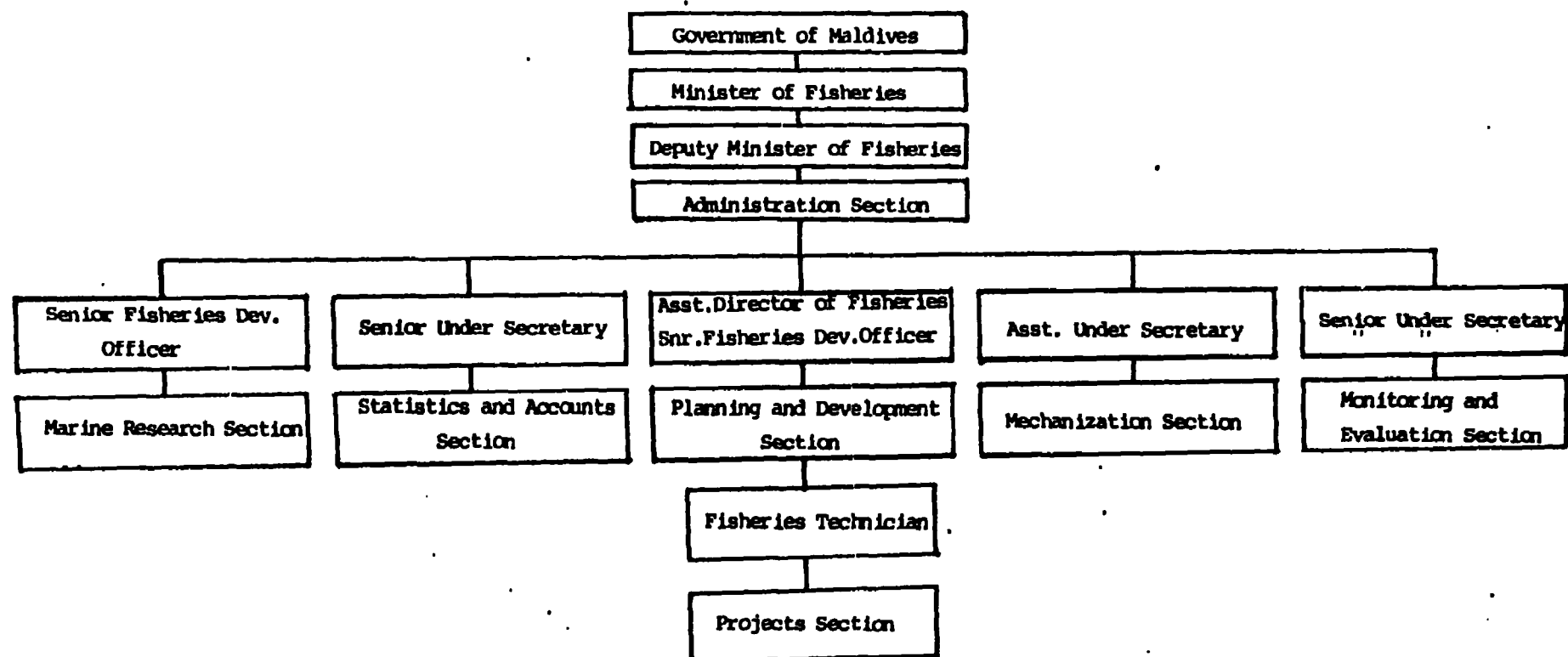
PROJECT PERFORMANCE AUDIT REPORT

MALDIVES FISHERIES PROJECT
(CREDIT 907-MAL)

FISHERIES SECTOR TECHNICAL ASSISTANCE PROGRAM

<u>Funding/Lending Agency</u>	<u>Amount (US\$)</u>	<u>Objectives</u>
1. FAO/NORAD (completed)	130,000	Improvement of fisheries statistics, particularly catch and costs/earnings data; also a marketing survey for dried fish
2. FAO/TCP (completed 82/83)	22,000	Improvement of dried fish production and storage
3. FAO/TCP	105,000	Testing and evaluation of anchored, surface rafts (fish aggreg. devices)
4. Kuwait Fund	9.5 million	Building up infrastructure to process and market frozen tuna from southern atolls; also construction of 100 new (2nd generation type) fishing vessels
5. IDA (2nd Fisheries Project)	5.0 million	Construction of freezing and storage complex in northern atolls and of 20 fishing vessels; also technical assistance for staff training and complex management, etc.
6. FAO/TCP	85,000	Establishment of quality control systems for dried fish
7. UN Emergency Fund	50,000	Increasing fish production by credit for establishing 14 fish aggreg. devices
8. UNESCO	51,000	Support for education in fisheries science
9. FAO	70,000	Development of extension services and staff training locally and overseas
10. IRDC	200,000	Investigation of feasibility of bait-fish culture in Maldives
11. Islamic Development Bank	100,000	Feasibility study for fish processing and canning development
12. UNDP/IDRC/FAO	901,000	Establishment and equipment of Fisheries Research Institute
13. Kuwait Fund	374,000	Feasibility study for exploitation of Maldives shrimp stocks (identified by R.V. "Dr. Fridtjof Nansen" survey)
14. FAO/Norway (funds in trust)	?	Study of suitable surveillance and fisheries management systems
15. UNDP Interregional Project	0.6 million	Management of Indian Ocean tuna resources

PROJECT PERFORMANCE AUDIT REPORT
MALDIVES FISHERIES PROJECT
(CREDIT 907 -MAL)
MINISTRY OF FISHERIES - REVISED ORGANIZATION CHART



PROJECT PERFORMANCE AUDIT REPORT

MALDIVES FISHERIES PROJECT
(CREDIT 907-MAL)

PROJECT DESCRIPTION AND BACKGROUND OF
MALDIVES SECOND FISHERIES PROJECT^{1/}

1. The main objective of the second project would be to help GOM:
 - (i) expand the fisheries sector infrastructure to enhance productivity of the fishing fleet;
 - (ii) facilitate the current fish pricing system to become more effective in promoting increased production;
 - (iii) develop new markets for frozen fish exports; and
 - (iv) strengthen the diesel fuel distribution system.

For these purposes, the project would finance investments in fish collection and storage and fuel oil distribution facilities, the lack of which greatly hampered mechanized fishing operations. Such facilities would assist GOM in enhancing the effectiveness of the current process in which fish prices paid to the fishermen are being determined. The northern third of the country is currently most deficient in fish collection facilities, while fuel distribution needs improvement nationwide. The KFAED-financed project provides fuel distribution and fish collection services augmenting existing private operations and satisfying infrastructure requirements for the south. The project facilities would make it possible to expand fish collection north of Male, and improve fuel distribution in the northern and central parts of the country. In planning to ensure effective operation of project facilities, GOM, through its Fishery Advisory Board, would continue to improve its review of the relative competitiveness of fishing operations, aimed at timely adjustment of fish prices, and make rational decisions on the role of the sector in providing employment, export earnings and government revenue.

2. To help achieve the project objectives, the following are financed under the second project:

- (i) a refrigeration complex at Felivaru Island consisting of a 25 mt/day ice plant with ice storage capacity of 150 mt, and a 40 mt/day fish freezer and 750 mt cold storage;

^{1/} Taken verbatim from SAR, Maldives Second Fisheries Project, Report No. 4084-MAL dated January 6, 1983 (paras. 4.02 - 4.04).

- (ii) a fleet of four fish collector vessels to enable the State Trading Organization (STO) to collect fish in the project area and deliver to the refrigeration complex;
- (iii) fuel distribution facilities, consisting of a 1,200 mt bulk fuel storage at Felivaru, and a network of 11 small fuel tanks located at various atolls supported by two 100 mt tankers;
- (iv) a fleet of twenty fishing vessels of two improved designs to be initially owned and operated by STO to carry out inshore and distant water fishing;
- (v) infrastructure required for the above, consisting of water collection/storage facilities, an electric power generating unit, improvement of the fish landing jetty, a slipway, a barge load-out, two barges, a transport vessel, a workshop and staff living quarters; and
- (vi) technical assistance for (a) preparation of detailed design of some project facilities, procurement, and supervision of the construction work, (b) management of project facilities after construction implementation, (c) training of local staff in management and technical subjects, and (d) preparation of a follow-up project.

3. The project facilities would expand the inadequate fish collection and fuel distribution services currently available to the fishing fleet operating in the project area. The refrigeration complex has been situated at Felivaru because of: (i) its central location in the area close to well populated islands and excellent fishing grounds; (ii) its well protected landing facility and deep water at the end of the jetty; and (iii) the ability of the canning plant to share its highly trained support staff and some existing infrastructure with the project. However, since the canning plant has no excess ice and water supply, and has old power generators, project facilities would be completely self-supporting. Proper handling of harvested fish requires a regular supply of ice and a fleet of well organized collector vessels to deliver ice to fishing vessels and to pick up procured fish for transport to the project's fish freezing plant. The project would initiate the use of locally constructed fish boxes on existing fishing vessels to improve the quality of fish. A system of fuel distribution facilities is needed to provide the fishing fleet with an adequate supply of fuel. To make it possible to harvest fish at distant, hitherto lightly exploited fishing grounds and inshore areas, it would be highly desirable to deploy a new fleet of distant water fishing vessels which have been designed under the ongoing first project. To service these project facilities, the following investments in infrastructure would be essential: an expansion of the capacity of the existing jetty to facilitate loading of ice bound for fishing vessels and unloading of fish from collector vessels, a slipway to service the various vessels, an electric power generating unit for the project shore facilities and staff living quarters. In addition, substantial

technical assistance would be necessary to help GOM: (i) prepare and execute detailed design of the infrastructure components; (ii) assist GOM with procurement; (iii) supervise construction of the refrigeration complex, oil tanks and infrastructure; (iv) manage project facilities for a period of three years; (v) train local staff in management and technical skills; and (vi) identify and prepare a follow-up project.

PROJECT PERFORMANCE AUDIT MEMORANDUM

MALDIVES FISHERIES PROJECT
(CREDIT 907-MAL)

MINISTRY OF FISHERIES COMMENTS ON PPAM

RCA1477

246423 WORLDBANK

77033 MAS MF

REF NO.MF/85/31 (27-2-85)

ATTN.DIRECTOR OPERATIONS EVALUATION DEPT.

YRLET DEC 20 1984.WHILE IN GENERAL WE FEEL THAT PROJECT PERFORMANCE

AUDIT REPORT/MALDIVES FISHERIES PROJECT AND APPRECIATE COMMENTS
ABOUT MOF,HAVE FOLL COMMENTS TO MAKE.

Paragraph
References
(Page nos.
have
changed)

(1) PAGE 5 LINE 8 FEEL SHUD RAE0 IN ORDER TO FACILITATE THAT
ADJUSTMENT IN 1972 GOM INVITED ETC.

para. 7

(2) PAGE 6 LINE 3 SHUD READ WITH FAO AND OPEC FUND ASSISTANCE II
ANCHORED ETC.

para. 8

(3) PAGE 6 LINE 10 SHUD READ 6 EVERY TWO MONTHS.) LINES 11 N 12
SHUD READ FINANCE UPTO 20 NEW FISHING VESSELS FOR THE NORTHERN
AND 100 SECOND SECOND GENERATIONS VESSELS FOR SOUTHERN MALDIVES
ARE BEING PROVIDED RESPECTIVELY BY ETC.THIS CHANGE SUGGESTED
SINCE DESIGN OF 20 VESSELS NOT DECIDED.

para. 8

(4) PAGE 7 LINE 9 ONWARDS SHUD READ CREDIT,STATISTICS AND PLANNING
THE MINISTRY OF TRADE N INDUSTRIES HANDLES NEGOTIATIONS N
ARRANGEMENTS.WITH PRIVATE FOREIGN COMPANIES ON BEHALF OF GOM
(EARLIER DTFI WAS RESPONSIBLE FOR THESE MATTERS) MOF MAINTAINS
CLOSE COORDINATION WITH THE NATIONAL PLANNING AGENCY (,NPA)
(MINISTRY OF PLANNING AND DEVELOPMENT) AND THE MALDIVES MONETARY
AUTHORITY (MMA) TO ENSURE THAT FISHERIES POLICY CONFIRMAS TO
NATIO NAL DEVELOPMENT OBJECTIVES IN ADDITION,THE STATE OWNED
MALDIVES FISHERIES CORPORATION (,MFC) (NOW DESOLVED) WAS
EXECUTED THE KUWAIT FUND PROJECT IN SOUTHERN MALDIVES TO EXPAND
ITS FISH COLLECTION,FREEZING AND EXPORTATION ACTIVITIES,THIS
PROJECT IS NOW BEING EXECUTED BY THE NEWLY FORMED FISHERIES
PROJECTS IMPLEMENTATION DEPARTMENT OF THE STO. THE STO WHICH IS
THE ETC.

para. 9

(5) PAGE 16 . NOTICE THERE IS NO MENTION OF LONG RAGE VESSEL.IN
FACT,WE FEEL ONE SHORTCOMING IN WHOLE REPORT IS THAT HARDLY ANY
COVERAGE GIVEN TO LORAN VESSEL,ITS CONSTRUCTION,OPERATION SUCCESS
OR FAILURE.LINE 16 SHUD READ 31 NOT 21 AS SPARE LIGHTS TOO NOW
INSTALLED.THIS NO.TO REPLACE 29 WHEREEVER ELSE IT APPEARS.LINE
19 'SUGGEST REPLACE BEYOND EXPECTATIONS BY QUITE EFFECTIVE

para. 24

(6) PAGE 17)LINE 3 ONWADS SHUD READ THE EXPERIENCE WITH THESE
VESSELS RESULTED IN THE SETTING UP OF A BOAT BUILDING YARD AT
RAA ATOLL TO CONSTRUCT 100 VESSFLS OF THIS DESIGN BY A CREDIT
PROGRAMME FUNDED BY KFAED .DELETE THE REMAINING PART OF PARA.

para. 25

Paragraph
Reference s

(7) PAGE 18 SUGGEST DELETE GIVEN THE GOOD SYSTEM ---- BY RADIO, para. 28
AS RADIO COMMUNICATION IS NOT ALWAYS SO GOOD.

(8) PAGE 19)LINE 4 SHUD READ ---- BUT HAVE BEEN ALLEVIATED TO para. 30
SOME EXTENT. SUGGEST DELETE FOLL 2 LINES.

(9) PAGE 21 PARA 36 SHUD STOP AFER BY A NO. OF FISHERMEN M para. 36
AND DELETER REM PART OF PARA.

(10) PAGE 23 LAST PARA NO.SHUD BE 41 NOT 38 para. 41

(11) PAGE 26 LINE 3 SHUD READ FAO,OPEC FUND N UN EMERGENCY FUND para. 45
(THRU UNDP) AND LINE 4 (FADS) ARE BEING INTRODUCED ETC

(12) PAGE 29 LINE 10 ONWADS SHUD READ THE BOAT MECHANIZATION para. 50
SUB-LOAN AGREEMENTS STIPULATED THAT FOR A MINIMUM PERIOD OF
TWO YEARS VESSELS SHOULD NOT BE USED FOR INCOME EARNING PURPOSES
OTHER THAN FISHING.THIS PERIOD USULLY VARIED UPTO EIGHT YEARS,
DEPENDING ON THE DATE.THE FULL AMOUNTT DUJE WAS PAID BUT THIS
OBLIGATION CEASED AS SOON AS THE AMOUNT DUE WAS PAID OFF AFTER
FOUR YEARS.THIS CHANGE SUGGESTED AS THIS GIVES A MORE TRUE
PICTURE OF WHAT IS PRACTISED.

(13) TABLE 2 NO OF I MECHANISED OHONIS SHUD READ 1980 (805) Table 2
1981 (970) 1982 (1166) 1983 (1304)

(14) TABLES 3 ITEM 7 SHUD READ UN EMERGENCY FUND NOT IFAD Table 3
ITEM 8 SHUD BE ONLY UNESCO.ITEM 9 ONLY FAO.ITEM 10 'SHUD BE
IDRC N AMOUNT 200000 US DOLLARS.N 15 SHUD BE DELETED N
REMAINIGN ITEMS RENUMBERED ACCDNGI Y.

K(15) ANNEX 1 FORWARDING AMENDED ORGANIZATION CHART SOONEST.

(16) ON WHOLE REPORT WE FEEL FOLL OBSERVATIONS SHUD HAVE BEEN
INCLUDED , (A) LORAN VESSELS OPERATIONS AS INDICATED EARLIER
(B) ABSENCE OF MONITORING PROJECT (C) CHEKING ON REPAIR
CENTERS N LIGHT S

(17) COMMENTS ON PCR FOLLS IN ANTOTHER TLX. REGRET ONE RESPOSE
AT SUCH LATE STAGE.

RGDS,FISHERIES MALDIVFS
77033 MAS MF

248423 WORLDBANK

=02270800

=02270615

.ALT RTD FROM:OEDM

NNNN

PROJECT PERFORMANCE AUDIT MEMORANDUM

MALDIVES FISHERIES PROJECT
(CREDIT 907-MAL)

MINISTRY OF FISHERIES COMMENTS ON PCR

REF NO.MF/85/32 (27-2-85)

ATTN.DIRECTOR OPERATIONS EVALUATION DEPT.

REF OUR TLX NO.MF/85/31 (27-2-85)

Paragraph
References
(Page numbers
have changed)

WHILE REALIZING THAT PCR MAY WITH ITS ANNEXING MAY HAVE NOW
SERVED ITS INTENDED PURPOSES WITHIN BANK WE HAVE FOLLOWING COMMENTS
TO MAKE

(1) PAGE 7 5.01 LINE 13 SUGGEST DELETE WORDS QUOTE AND LAND para. 5.01
REQUISITION UNQUOTE AS IT HAS BEEN FELT THAT LAND REQUISITION
REALLY DID NOT ULTIMATELY CONTRIBUTE TO DELAYING INSTALLATION
OF MRCS

(2) SAME SECTION PART REFERRING TO SEC.GIVEN VESSELS. para. 5.01
SUGGEST IT BE BROUGHT IN LINE WITH WORDING OF () OF OUR
ABOVE TLX.SAME FOR ALL REFERENCES TO SEC.GEN VESSELS IN OTHER
PARTS OF PCR AND ANNEXES

(3) PAGE 12 LINE 3 SUGGEST AMEND TO READ QUOTE FISHERMEN para. 5.12
SOUGHT OTHER AVENUES OF EMPLOYMENT UNQUOTE

(4) PAGE 18 SEC 6.04 III) SUGGESTED THAT THESE SECTION BE para. 6.04
DELETED ALTOGETHER AS MANY DISCREPANCIES.

(5) PAGE 19 SEC 7.04 DTW SHUD CORRECTLY BE DPW para. 7.04

RGDS,FISHERIES MALDIVES
77033 HAS MF

248423 WORLD BANK

=02270847

=02270634

ALT RTD FROM:OEDM

NNNN

OED Note: Changes made except for
the deletion of para.
6.04(iii). Some
modifications, however,
were made in that
paragraph.

PROJECT PERFORMANCE AUDIT MEMORANDUM

MALDIVES FISHERIES PROJECT
(CREDIT 907-MAL)

STATE TRADING ORGANIZATION COMMENTS

REF: 854 27.2.85

ATTN: MR YAKINORI WATANABE
DIRECTOR , OPERATIONS EVALUATIONS DEPT.
IDA / WORLD BANK

CC: MOF / MALDIVES

YR ITR 20.12.84 - PROJECT PERFORMANCE AUDIT REPORT (CREDIT 907-MAL) ALLOW ME COMMENT AS FOLLOWS .

(1) UNDER CHAPTER ONE - THE SETTING SUB SECTION FISHERIES SECTOR
PARA (90 ON PAGE (7)

- THE ORGANISATION OF THE SETOR HVE UNDER GONE CONSIDRABLE CHANGES. WHILE MOF* IS STILL DEALING WITH FISHERIES POLICY AND PLANNING MECHANIZATION AND CATCH STATISTICS, ADMINISTRATION OF FISHERIES CREDIT, DTFI IS NO LONGER INVOLVED IN THIS SECTOR AT ALL (.) INSTEAD THIS FUNCTION IS NOW HANDLED BY MINISTRY OF TRADE AND INDUSTRIES (.)
- SIMILARY , KUWAIT FUND PROJECT FOR SOUTH OF MALDIVES IS NOW BEEN IMPLIMENTED BY THE FISHERIES PROJECTS IMPLIMENTATION DEPARTMENT (FPID) OF THE STO (.)

(2) OTHER THAN THE ABV WE DONOT HVE MUCH COMMENTS TO MAKE (.) WE MADE TO U/STAND THAT MORE DETAILED COMMENTS RE ABV, AS WELL AS PTOJECT IMPLIMENTAION, ETC., WUD BE FORTHCOMING FROM FROM MOF, AS THE IMPLIMENTING AGENCY FOR THE FIRST IDA PROJECT (.)

* Ministry of Fisheries

THANKIN YOU
SINCERLY YOURS
ILYAS IBRAHIM
State Trading Organization (STO)

OED Note: Comments taken into account on basis of detailed comments by MOF (Appendices 1-2).

STO MALE
66006 STO MF

**UNITED NATIONS
DEVELOPMENT PROGRAMME**



**PROGRAMME DES NATIONS UNIES
POUR LE DEVELOPPEMENT**

OAKVILLA, 4 Kulhidhoshumagu
P O Box 2058, Male', Republic of Maldives

Telephone: Office: 4501

Cable Address: UNDEVPRO, MALE'
Telex: 66011 UNDP MF

20 February 1985

Dear Mr. Watanabe

Project Performance Audit Report: Maldives
Fisheries Project (Credit 907-MAL)

Please refer to your letter of 20 December 1984 requesting comments from my office on the Project Performance Audit Report for the Maldives Fisheries Project (Credit 907-MAL), in which UNDP participated with the financing of the technical assistance component, in our project MDV/79/002. Having been rather closely associated with the mission by Mr. Watson, which resulted in the report, I read it with great interest. The IDA-investment operation as such was, of course, not our direct concern, and I have not much to say about the report in this respect, but there are some issues which concerned the entire fisheries sector, and which are also of consequence for the results of the t.a. activities. In hindsight, it might perhaps have been interesting, if the audit report had gone somewhat into the criteria for the selection of boat-owners who became eligible for a loan under the project to mechanize their dhoni. As such boat-owners are already a favoured group in the society, and how among them the beneficiaries of the loan were selected may have had social consequences worth analyzing.

I noticed that two issues, which were discussed with Mr. Watson were extensively dealt with in the report. This concerns in the first place the phenomenon of the shifting away, by dhoni's mechanized under the project, from fishing and into transportation of persons and commodities. The report is somewhat apologetic about this but it was, coincidentally, a very beneficial effect, as it removed a crucial bottle-neck in the explosively growing tourist industry which is undoubtedly the most dynamic growth factor in the Maldives economy. A second point, which rightly received attention in the report was the shortage of coconut palmwood, a factor outside the fisheries sector as such, but certainly of consequence for the boatbuilding industry, and in this way also for fisheries. The report mentions that the "new generation" vessels built in Alifushi are

Contd.... 2/-

Mr. Yukinori Watanabe
Director
Operations Evaluation Department
The World Bank
1818 H Street, N.W
Washington, D.C 20433
U.S.A



20 February 1985

constructed with imported timber, but I doubt that this will be a solution for the entire industry. Traditional boat building is based on the characteristics of coconut palmwood, and construction with imported timber would require considerable retaining of the traditional boatbuilders throughout the country.

The success of the technical assistance component, duly reflected in the report, has, of course, been a source of satisfaction to us. The report could, however, in my opinion have given more attention to the utilization of the long range vessel, built under this component, which is not yet an assured success. This is all the more important since further structural changes in the fishing industry would depend very much on the new possibilities which this type of vessel should open up, not only because of direct delivery to processing plants, as the report points out, but because this vessel would presumably give access to new fish resources off shore. In this respect I should perhaps mention that on the basis of indications from resource surveys the impression exists that with the existing type of fishing the industry is not so far away from a resource ceiling. As yet, the long range vessel has not given many useful results. The report of the master fisherman, provided under the t.a. component, under whose direction the first test runs took place, is long overdue. (The Bank should insist on this report being produced now soon). The circumstances which necessitated this additional technical assistance (originally not foreseen in the project document) have not changed all that much, and now that with the installation of the navigation system coming up, the vessel is almost entirely ready for full use, the Government still has the same problem. The type of operation in fishing trips for several days is so different from the current type of fishing, that the know how for it does not exist within the country, and further technical assistance may be required for the Government to be able to draw the full benefits of the vessel. (This would have to be looked into in a future supervision mission).

I hope the above comments are of some use. They do not detract from my general appreciation for the report, which I found accurate and relevant.

Yours sincerely


Jacob Guijt
Resident Representative

PROJECT COMPLETION REPORT

MALDIVES

FISHERIES PROJECT

Credit 907-MAL

October 18, 1984

South Asia Regional Office

PROJECT COMPLETION REPORT

MALDIVES

FISHERIES PROJECT CREDIT 907-MAL

I. BACKGROUND AND INTRODUCTION.

1.01 The Republic of the Maldives joined the International Monetary Fund (IMF) and the Bank group in January 1978. The Fisheries Project was the first lending operation in the country.

1.02 Maldives is an archipelago consisting of 19 coral atolls with about 1100 small islands in the Indian Ocean about 400 miles southwest of India and Sri Lanka (see map IBRD 13994R(PCR)). The atolls form a double chain that stretches about 500 miles from north to south and 80 miles across, and covers an area of 41,500 square miles. The total land area is estimated at 115 square miles. About 25% of the total population of 168,000 live in the capital, Male, with the balance living on about 200 of the other islands.

1.03 Fishing is the mainstay of the economy, accounting for about 20% of GNP and 90% of exports. Since the establishment of the first resort hotel in the Maldives in 1972, tourism has expanded rapidly. The number of tourists visiting the Maldives increased from 1,500 in 1973 to about 60,000 in 1982. Maldives also obtains foreign exchange from its international shipping operations.

1.04 Although the exchange rate of the Maldivian Rufiyaa (Rf.) is determined in the free market, GOM applied an administrative accounting rate of Rf 3.93 to US \$ 1.00 (1979-1981) to most of its transactions during the first part of the project implementation period. The Government did not buy or sell foreign exchange in the free market, where the rate for the Rufiyaa was substantially different (Rf 7.5 = US\$1.00). In 1983, the free market and administrative rates were adjusted, while the free market rate was given a more important role. The application of the administrative accounting rate for payment to the local fishermen for fish to be exported in frozen or canned form amounted to an implicit tax on these exports of about 50%, as GOM acted as intermediary for all fresh fish sold by the fishermen. (See Annex 5 for details of the year to year rates from 1978 to 1982).

II. THE FISHERIES SECTOR

Background

2.01 Maldives has historically been best known for its exports of cowry shells, which in the Indian subcontinent and in Africa were used as money. It was the only exporter of these shells, and the export was well established in the 16th century. In addition, Maldives developed a unique tuna fishery. For centuries it comprised of sailing boats catching tuna of which a sizable portion was exported in dried form. During the last decade more than 2000 sailing boats caught an average of about 30,000 metric tons

(mt) of tuna annually. Actual catches fluctuated between 22,600 mt and 35,000 mt in years for which data are available. Most of this catch was exported to Sri Lanka as a salted, smoked and dried tuna speciality product called Maldivian Fish. Until early 1970 the fishery did not experience any major technological change; exports reached nearly 30,000 mt fresh fish equivalent in the late sixties, but beginning in about 1971, the Sri Lanka market gradually dwindled until 1978, when exports of Maldivian Fish virtually stopped because of Sri Lanka's foreign exchange problems. In 1972 the Government of the Maldives (GOM) had begun to explore other markets for tuna. By 1977, GOM had entered into contractual arrangements for fish collection, freezing, cold storage and export with two foreign companies and a joint venture. In 1977, Maldives exported about 11,000 tons of frozen tuna at a value of US \$ 1.8 million. In addition, US \$ 1.0 million worth of smoked tuna, called Katsubushi in the Japanese market, was being processed and sold while the joint venture operated a small tuna cannery. At the time of project appraisal in 1979, the industry was in transition from a unique artisanal based sailing boat fishery to one demanding more modern fishing methods, vessels and gear brought on by the necessity to bring fish rapidly from catching grounds to freezing facilities in order to satisfy international quality standards.

2.02 At the time of appraisal it was understood that there was a critical need to become less dependent on one single market for exported fish, hence the need to diversify. To accomplish this, it was essential that the fleet become more efficient and versatile. Motorization would allow fishing vessels to timely deliver fish to foreign collector vessels. Moreover, future development dictated that a gradual evolution be started toward vessels with greater fishing capability, carrying capacity, ice storage and range, so that they could be used for several fishing methods and not be solely dependent upon the traditional pole-and-line fishing for tuna. The Fisheries Project financed by IDA was structured to be the first phase ^{1/} of a response to the need for a gradual transition from a fishery almost purely artisanal and single purpose to one more modern in character, and multi-purpose. This multi-purpose fishery would retain some of the best of the artisanal experience such as boat design and fishing methods. The key-components of the first project: motorization and technical assistance, were designed to be sequential elements leading toward the Second Fisheries Project which addressed the more complex issues of fuel supply and marketing facilities.

2.03 Service facilities for the fishing industry in Maldives were limited prior to 1978. In 1974, GOM began to mechanize sailing vessels on a trial basis. In 1975, the Japanese Government provided a grant for 116 engines. The next year, an additional 300 engines and pre-fabricated building materials for two maintenance and repair centers (MRCs) were imported with financial assistance from Iran. The equipment for three more MRCs was financed by a grant under Japanese bilateral aid. Thus five MRCs existed prior to project implementation, temporarily managed

^{1/} The second phase is the subject of the Maldives Second Fisheries Project approved by IDA January, 1983 (Cr. 1320 ML).

by the supplier of the engines.

2.04 Fuel for mechanized vessels was distributed by the three foreign fish collecting and marketing companies and by the State Trading Organization (STO) in Male. In 1978 the companies supplied fuel at Rf 0.60 per liter, in theory to all fishing vessels, but in practice only to fishing vessels which sold fish to the companies. The price charged by the companies compared to Rf 1.65 per liter for fuel supplied by STO which was used by all other fuel consumers. The high subsidy borne by the companies caused them to limit fuel supplies. However, GOM was unwilling in 1978 to disrupt the distribution and pricing system then in existence, as fuel distribution was an essential condition for the companies' operations.

2.05 At appraisal, there were no aids to navigation in the Maldives outside Male island. This discouraged fishermen from fishing out of sight of land; collector vessels and mother vessels could sail only during the daytime which severely hampered their efficiency. Fishing vessels were also hampered by lack of navigational aids within the atolls.

2.06 Two agencies were responsible at appraisal for fisheries development: the Ministry of Fisheries (MOF) and the Department for Tourism and Foreign Investment (DTFI), now the Department of Tourism. The former deals with general fisheries policy and planning, mechanization and catch statistics. DTFI was responsible for foreign investment in fisheries.

III. PROJECT FORMULATION AND DESIGN

Project Formulation

3.01 The project was identified and prepared as part of an overall fisheries sector survey by German Consultants, financed by the Kuwait Fund for Arab Economic Development (KFAED). The consultants' report recommended mechanization of the traditional fishing vessels, a frozen fish export scheme, development of a fishery for off-shore resources, and a substantial technical assistance program.

Project Design

3.02 The project was conceptualized by IDA staff as the first of a linked series of projects to develop the fisheries sector in the Maldives. It was seen by the authors of the consultants' report and IDA staff that the following three areas needed priority attention as a necessary first step to develop the sector:

- (i) strengthen the knowledge of resources and test new technology for fishing methods, vessels and equipment;
- (ii) improve fish production through mechanization of the traditional fishing craft, utilizing the existing design to the maximum extent possible; and
- (iii) develop the capability to manage exports of frozen tuna.

The appraisal mission identified the need to strengthen navigation capabilities to assist both the fisheries and transport sectors (para 2.05).

3.03 It was envisaged that the first project would focus on the first two topics while facilitating future development of frozen fish exports. Although detailed knowledge of all fish resources would obviously be useful, available data indicated that the Maldives did have access to substantial tuna resources, and that future development of tuna fisheries would not be hampered by resource constraints. Therefore, taking into account ongoing FAO research, no resource survey was included. IDA envisaged a practical evolution of the tuna fishery, initially based on traditional mechanised craft. The next step would be to improve the efficiency of the vessels while retaining most of their existing features. Finally, a totally new vessel might be developed, which would have a multi-purpose character and would be suitable to supply fish directly to freezing and processing facilities, by-passing the existing system of collector vessels.

3.04 Although IDA correctly perceived the need to develop mechanized fisheries, it underestimated the growth of demand for mechanization. The sectoral developments discussed in Chapter V forced the Maldives into a policy of rapid structural change, leaving no time for gradual evolution.

3.05 IDA correctly estimated the need for a flexible technical assistance component which was essential to further sectoral development. Of particular concern were the needs to assist GOM in:

- (i) improving the efficiency of newly mechanized vessels;
- (ii) evaluating the feasibility of multi-purpose vessels; as well as to
- (iii) develop the basis for future investment in marketing infrastructure.

3.06 The details of these efforts are found in chapter IV and V. The mechanization component and the technical assistance program were appraised by IDA in September 1978. Negotiations were held in Washington, D.C., during April 1979.

IV. THE PROJECT

Objectives

4.01 The project was designed to meet the following objectives:

- (i) increase fish production of the Maldives by increasing the efficiency of fishermen through provision of credit for motorization of pole and line sailing vessels and provision of technical assistance; and
- (ii) improve the safety and efficiency of fishing operations and marine transport by the installation of navigation aids.

To achieve these objectives, the following was to be provided:

- (i) credit to fishermen for motorization of about 500 sailing vessels;
- (ii) five additional MRCs to service mechanized vessels;
- (iii) installation of 12 navigation lights ^{1/}, 20 reef marker buoys, 100 reef entrance markers and 20 fishing ground marker buoys;
- (iv) technical services to assist GOM with procurement; and
- (iv) technical assistance, financed by UNDP, comprising training of fishermen, design and construction of modified traditional mechanized vessels and a multi-purpose vessel and preparation of a feasibility study for a marketing infrastructure investment project.

Vessel Mechanization

4.02 The project was to finance a credit scheme for about 500 diesel engines and associated spare parts to mechanize traditional sailing pole and line fishing vessels or newly built vessels, to be administered by MOF. In addition, the project would finance an inventory of spare parts.

Maintenance and Repair Centers

4.03 Five MRCs, fully equipped to carry out routine maintenance, major overhauls and engine repairs, were to be set up under the project. Each center was to be self-contained, have its own power supply and stocks of spare parts and would be run by two locally trained mechanics. On-the-job training of local marine engine mechanics was to be carried out in Male in the central maintenance and repair center through an ongoing UNDP-financed vocational training course which was to be strengthened.

Navigational Aids

4.04 The project was to include 10 navigation lights with a range of 6-7 miles. In addition, the project was to include a provision for 20 buoys to mark reef entrances of important fishing atolls. Finally, provision was made for 20 larger buoys to mark open sea fishing grounds to facilitate speedier identification of these grounds, especially by fishermen from outside the area.

4.05 The lights were to be installed on 18 ft steel structures by the Public Works Department (DPW), assisted by the Ministry of Provincial Affairs (MPA). The other aids to navigation were to be installed

^{1/} including two spares.

by DPW through local atoll authorities. Routine maintenance of the lights was to be by DPW; the other aids would be regularly inspected by the authorities.

Technical Services

4.06 GOM lacked experience with IDA procurement procedures and was to retain procurement consultants to assist in preparing, and evaluating bids and in preparing tender and contract documents.

Technical Assistance

4.07 During preparation of the IDA project, the need for further improvement of mechanized fishing operations was clearly felt. UNDP expressed an interest in financing such technical assistance. GOM requested that IDA be Executing Agency. The technical assistance was to consist of:

- (i) a training program for skippers and master fishermen whose vessels were being mechanized in Male;
- (ii) detailed design of possible improvements for existing mechanized vessels. The project was to include leasing of two mechanized vessels from the Government for the training program, and to improve these vessels in the Male Boat Yard in order to show the advantages of the improvements to local fishermen;
- (iii) design of a "second generation" pole and line vessel incorporating more design improvements;
- (iv) building of about five prototype "second generation" vessels (to be mechanized under the IDA mechanization program);
- (v) design and building of a long range multi-purpose vessel to explore opportunities for commercial trips of 3-4 days to more distant fishing grounds outside the atolls;
- (vi) the preparation of a feasibility study for a fish collection and marketing and a fuel distribution project.

Project Costs, Financing and Procurement

4.08 Cost Estimates. Total project costs were estimated at Rf 15.3 million (US\$3.9 million). Actual and estimated costs are presented in Annex 1. Project cost estimates included US\$ 280,000 UNDP financed technical assistance.

4.09 Sub-loans under Credit Program. MOF would carry out the fishing vessel mechanization program through a fisheries credit scheme. Loans to fishermen had a repayment period of eight years with no grace period, and an annual interest rate of 9%.

While MOF did not charge any interest on the ongoing mechanization loans, it was considered desirable to charge an appropriate rate of interest on project sub-loans for the purpose of introducing some measure of rational resource allocation and of augmenting the resources available to the Government for reinvestment. MOF would charge 9% interest on all project mechanization loans and would not undertake mechanization of pole and line fishing vessels with other external financial resources in a way which would impair execution of the IDA project. The estimated financial rate of return on investment in mechanization was high, ranging from 24 to 29%. Inflation in Male in 1978 was about 15% per annum and about 5% outside Male.

Procurement

4.10 Motorization. The contract for the supply of 500 engines, spare parts, equipment for MRCs and aids to navigation was to be awarded through ICB.

Important Covenants

4.11 A condition of effectiveness was that a Project Coordinating Committee (PCC) had been established by GOM. Other important conditions were that GOM would:

- (i) provide adequate funds to MOF, MPA and DPW to finance the local cost components of the project; and
- (ii) take all such actions as within its powers to ensure adequate supply of fuel for purposes of the project.

V. PROJECT IMPLEMENTATION

Overview

5.01 The project was approved in May, 1979, declared effective on August 10, 1979, and was to have been completed by August, 1981. However, the Closing Date was extended to March 31, 1983. Despite the delay, the project achieved virtually all of its objectives. The project credit program for vessel mechanization was highly successful. The program was administered well and loan recovery consistently remained at 100%. Although installation of engines at times was hampered by the limited installation capacity of the boat-yards in Male, mechanization proceeded at a regular pace. Demand for engines was high throughout project implementation, and continued after the project was completed. Installation and operation of MRCs was the least successful part of the project. Installation was substantially delayed, in part due to contractual problems and after completion suffered from lack of demand for repair services and shortages of staff. The navigational aids component

was expanded after appraisal at the request of GOM. Following the findings of a project financed survey on the location of lights a total of 31 lights (instead of the appraisal estimate of 12) were installed under the project. Light installation, after initial delays, proceeded well and all lights were installed by March, 1984. The impact of the design and training activities of the technical assistance components was beyond expectations. Four project designed and constructed "second generation" vessels were taken up by enterprising fishermen for test fishing operations. The construction costs of the vessels were shared between the fishermen and MOF. The positive experience with these vessels resulted in the setting up of a boat building yard at Raa atoll to construct these vessels on a continuous basis. The construction of 100 of these vessels is currently financed by a credit program under a project financed by KFAED. The training program not only trained a substantial number of fishermen, it succeeded also in introducing several technical innovations which since have been applied by many other fishermen. Perhaps most importantly, the project established the foundation for an effective and realistic development of the sector.

A. SECTORAL AND PROJECT ISSUES

5.02 Project implementation did not give rise to major issues, except for some delays in implementation (para's 5.18-5.24). However, the project was implemented in a rapidly changing sectoral environment which affected the financial, economic and social impact of the project. Despite the changing sectoral framework, the project was able to achieve its major objectives, not at least because of timely and effective GOM management. The most damaging development, outside local control, was the deterioration of the world tuna markets. This strongly affected Maldives' fishery sector, largely dependent upon exported tuna. In addition, fishing was hampered by shortages and price increases of fuel. Finally, the strong growth of the tourism and transport sectors created heavy demand for services of traditional fishing vessels, which in increasing numbers were drawn from commercial fishing activities.

5.03 The major issues which dominated the sectoral environment in which the project was implemented included:

- (i) the relationship between GOM and the foreign companies;
- (ii) collection and marketing of fish;
- (iii) changes in fuel and fish prices;
- (iv) availability of fuel; and
- (v) use of fishing vessels for other purposes.

5.04 All five issues ultimately affected the economics of fishing operations and the long-term future of the sector. However, their impact went further. To cope with the rapid succession of events, GOM was forced to redesign its short and medium-term development strategy, including its own role, stretching its implementation and management capabilities to the limit. The slow evolutionary process of technological change envisaged during appraisal had to make place for rapid adjustment, creating stress and hardship in fishermen communities. The process continues to this day and might result in the creation of two distinct fisheries: one traditional, with a relatively low efficiency, increasingly aiming at high value speciality products for special markets; and a technologically more advanced fishery involving capital intensive facilities aimed at lower priced bulk products. Also, GOM reluctantly agreed to a much more important role of government agencies in the fishing sector in terms of production, processing and marketing, when it was unable to maintain private operations in the country. GOM was able to attract substantial concessional aid in the process.

5.05 Relations between GOM and the Foreign Companies. Particularly during the first years of project implementation, the Maldives faced increasing pressure by the foreign companies to reduce fish prices. This pressure reflected the companies perception of future developments in the world tuna markets, and changes in corporate strategy, aimed at ultimately reducing their involvement in tuna production. As early as 1980, production and demand projections for tuna pointed to a rapidly increasing oversupply of raw material. In addition, demand for canned tuna showed limited growth, while production of canned tuna in countries with low labor costs increased rapidly.

5.06 The pressure brought about by the foreign companies to reduce prices was effective as the Maldives did not have the facilities to collect fresh fish itself. The 1979, annual negotiations between GOM and the companies resulted in a reduction of the US dollar prices paid by the companies to GOM of about 7%. Negotiated prices did rise in 1980 and 1981, reflecting a temporary upward move in world market tuna prices, before collapsing in 1982. GOM made arrangements to absorb the price reductions by maintaining, and (in 1980) increasing the Rufiyaa prices paid to the fishermen, de facto reducing the fish export tax (see para 5.09).

5.07 The process of disinvestment of the foreign companies which started in 1978 continued until 1983, when all companies, including the joint venture, had withdrawn. Two companies sold their assets in Maldives (a small tuna cannery and collector and mother vessels) to GOM, which continued operations with the help of expatriate technical expertise. In the meantime, the Maldives requested KFAED to finance a project in the southern part of the country, and IDA to finance a project in the northern part. Both projects would expand fish collection and storage facilities and strengthen fuel distribution. The KFAED project is expected to become operational in late 1984, while IDA agreed to finance its Second Maldives Fisheries Project in 1983. The project is currently under implementation.

5.08 Collection and Marketing of Fish. The first attempts, in 1975, to collect fresh fish by foreign companies were not very successful, as only a small number of vessels of the fishing fleet was mechanized and could reach the few collector vessels in a timely fashion. Sailing vessels generally proved too slow to deliver fresh fish in good condition to collector vessels and continued producing dried fish products. With the number of mechanized vessels well above 700 in 1978, and with a substantially larger number of collector vessels in the northern and southern sections of the country, collection of fresh fish proved feasible and rewarding there, even though most collection operations were seasonal. The gradual withdrawal of the companies after 1978 reduced the area in which collector services were available. This caused fishing vessel owners to consider to either move with the collector vessels, and abandon fishing operations from their own islands, or to take up alternative activities, i.e. transport and tourist services (para 5.11), or the less rewarding production of dried fish. Lack of adequate and regular collection services has had a negative impact on the financial viability of fishing operations, and has been a major factor for the increasing use of fishing vessels for other purposes. Outside the limited areas with good year-round fishing and collection services, vessel owners used their vessels for a variety of alternative functions, hedging the risks of an increasingly unpredictable fishery environment.

5.09 Changes in Fuel and Fish Prices. The general uncertainty concerning the availability of fish collection services was compounded by rapid changes in fish and fuel prices. Early in 1980, diesel fuel prices of fuel distributed by STO increased 80%, threatening the financial viability of mechanized fishing operations in many areas. Recognizing the potentially serious implications of lower fish catches on many aspects of the economy, GOM responded by changing its previously rigid adherence towards the use of the accounting exchange rate. By upwardly adjusting the Rufiyaa price paid to the fishermen for fresh fish by almost 25%, it de facto substantially reduced the export tax on fresh fish sales to the companies. In addition, GOM slightly reduced the increased fuel prices by 7%. Since then, the Maldives had pursued a policy to maintain fish prices at such levels as to ensure a satisfactory financial return to "average" fishing vessels, thereby gradually reducing the fish export tax to the current very low levels (Annex 5). This policy had become necessary to keep a sufficiently large number of vessels actively fishing to maintain fish exports. The policy was effective until 1982, when exports of frozen fish dropped as a result of a combination of bad catches (caused by changes in migration patterns of fish schools) and the dissolution of the joint venture which resulted in the temporary interruption of its activities. Since then, fishing activities have been maintained at relatively low levels reflecting the limited capacity of collection facilities for fresh fish. This period showed a continuing increase in dried fish exports, which provided a growing contribution to foreign exchange earnings.

5.10 Fuel supplies. During appraisal IDA reviewed fuel delivery, which was an important component of contractual arrangements between GOM and the foreign companies, which substantially subsidized fuel delivered to fishing vessels. The subsidy was an accepted part of the contracts

allowing the companies to collect fish. In view of the sensibility of these contractual relations, the appraisal mission concluded that it was too early to develop an alternative fuel distribution system. However, during negotiations, IDA agreed with GOM that GOM would use its best efforts to ensure adequate fuel supplies to the fishing fleet. When the number of mechanized vessels grew, the companies became increasingly reluctant to supply fuel freely at subsidized prices. They almost completely rationed fuel to those vessels which regularly delivered fish. As a result, fishermen increasingly relied on non-subsidised fuel bought from STU in Male, which was transported in drums to individual islands. GOM realized that lack of fuel reduced the efficiency of fishing operations and planned and executed a program to distribute non-subsidised fuel to islands with the largest fishing fleets. Although the program assisted in alleviating the worst effects of the general shortage of fuel, its capacity was never fully adequate and fuel shortages have negatively affected fishing operations in some areas throughout project implementation. Both, IDA's Second Fisheries Project and the KFAED project include fuel distribution components to create a fuel distribution network covering the entire country. With the progressively smaller amounts of subsidised fuel being distributed by the companies during project implementation, fuel subsidies have dwindled to insignificant amounts.

5.11 Use of Fishing Vessels for other purposes. Traditionally, fishing vessels in Maldives have been used for transport of goods and people, but those activities generally had a part-time character and augmented regular transport services carried out by specialized transport vessels. However, the rapid growth of the tourism industry and the economy in general caused the demand for transport services to substantially exceed the capacity of the traditional transport fleet. Demand for specialized services for tourist related activities increased with the growth of the number of resorts, from one in 1972 to over fifty in 1984. Initially, mechanized fishing vessels were recruited part-time for tourist related activities, but safety and convenience soon demanded conversion of the vessels, withdrawing them permanently from the fishing fleet. It is estimated that some 150-200 of Maldives 1,200 mechanized fishing vessels had become tourist vessels by 1984 of which a limited number had been mechanized under the project.

5.12 Demand for transport services between the atolls and Male grew substantially during the past ten years both in terms of passengers and goods: agricultural produce to Male, and food and building materials to the islands. Fishing vessel owners, particularly in marginal fishing areas, have increasingly used their vessels for transportation. Although earnings from transport appear lower than for fishing, they are regular, and involve a minimum of risk. Transport services are being provided by mechanized and non-mechanized vessels and in some marginal fishing areas support almost the entire (former) fishing fleet. Although the use of fishing vessels for transportation has affected the production of fish, such reduction would likely have taken place anyway, as a result of inadequate fish collection and fuel supply services available to the sector. Their use in transportation eased a critical bottleneck in the development of the country. However, reduction of the fishing activities

had important social implications as tourist and transport vessels required a fraction of the crew needed for fishing. As a result, a number of fishermen sought other avenues of employment.

B. FINANCIAL AND PHYSICAL PROGRESS OF THE PROJECT

5.13 Project Costs Savings and Disbursements. Actual total costs of the main component of the project, vessel mechanization, were only about 70% of appraisal estimates as GOM succeeded in procuring engines at extremely competitive prices. Some of the resulting savings were allocated to the navigational aids component to finance cost overruns resulting from an increase in the number of lights from 12 to 29. Technical assistance costs showed a slight increase. The actual disbursement profile compares favourably with the average profile for agricultural projects for South Asia. The credit, after cancelling \$0.7 million of savings, was closed after four years, compared to eight for average agricultural projects.

5.14 Physical Progress of individual project components were generally timely completed as indicated below and in Annex 2 and 3.

<u>Project Element</u>	<u>Started</u>	<u>Completed</u>
Procurement for motorization	4-80	4-81
Installation of engines	5-81	7-83
Construction of MRCs	8-80	1-82
Installation of Aids to Navigation	3-81	3-84
Training of Fishermen	10-80	4-81
Improved Vessel Design	10-79	11-79
Vessel Construction	1-80	9-83

Vessel mechanization suffered initially from delays in procurement. However, once the engines were delivered, installation proceeded at a regular pace. The installation capacity of the yards entrusted to install the engines was limited, in part because of changes in management and staff, and demand for mechanization exceeded installation capacity throughout the project period. However, steps taken by MOF to expand installation capacity in 1981 were effective in speeding up mechanization and minimized delays in this component of the project. Installation of navigation aids showed major delays, largely because the number of lights was expanded.

5.15 Management and Organization. In general, the agencies involved in project implementation performed highly satisfactorily. Project management was flexible, and given GOM's limited staff resources, of a very high quality. Project staff showed substantial initiative and strong leadership. Commitment of all government staff towards the project's objectives and timely implementation was exemplary.

5.16 Coordination and Implementation. General responsibility for project implementation was vested in a Project Coordinating Committee (PCC) which played an effective role coordinating project activities. It met regularly and closely monitored project activities. It was instrumental in

formulating an expansion of the navigational aids component of the project and strengthening of engine installation operations.

5.17 Ministry of Fisheries. MOF was highly effective in its day-to-day conduct of project activities. It administered the credit program for vessel mechanization, selected fishing vessel owners eligible for credit, and made arrangements for installing the engines. Despite staff shortages, MOF allocated adequate staff resources to implementation of the project. Project management was flexible, efficient and has substantially contributed to the project's success.

5.18 Procurement. Start-up of the project was slow as a result of delays in recruitment of procurement consultants. These delays stemmed largely from the unfamiliarity of MOF with IDA procedures. Delays in recruitment also effected the technical assistance component of the project. Nevertheless, the quality of the consultants which were recruited was very high. Procurement of diesel engines and navigational aids proceeded smoothly and resulted in extremely competitive prices for the equipment being procured; only delivery of equipment for MRCs was delayed as a result of administrative and shipping problems.

5.19 Vessel Motorization Program. The first shipment of 225 engines, together with spare parts was received in November 1980; the last consignment was received in April 1981. Six hundred copies of a local language translation of the 'Instruction Manual' for the engines were provided while an engineer from the supplier arrived in Male in February 1981 to execute a program to train Maldivian technicians in overhauling, repairing and maintaining engines. He trained 12 students during an 8 month period.

At appraisal it had been assumed that the 500 engines procured under the project would be installed by December 1982. Engine installation started at a rate of 8 per month. By June 1981, the capacity had increased to 15 engines per month, while by late 1981 the capacity had only slightly increased to 16 engines per month. To complete the mechanization program by end of December 1982, GOM acted decisively to increase capacity. The services of a recently established private boat yard were mobilized and progress on engine installation improved in the latter part of 1982. Minor management, manpower and technical problems at the yards slowed progress, but by July 1983, all 500 engines had been installed.

5.20 The credit program supporting the mechanization program operated highly efficiently and effectively. Fishermen would register with MOF to obtain an engine; once selected they would sign a loan agreement in which they agreed to use their vessel for four years predominantly for fishing operations. Recovery was handled by the Department of Finance, to which the fishermen repaid once or twice a year. A fairly large number of beneficiaries repaid their loan in full prior to it coming due, to avoid non-compliance with the vessel use clause. Recovery of almost 100% was highly satisfactory. From time immemorial Maldives authorities have enforced strict loan repayment to maintain a healthy recovery climate. Non-repayment almost automatically resulted in local authorities imposing restrictions on the defaulter to leave his island; as a result all borrowers made sure they were current.

5.21 Construction of Maintenance and Repair Centers. The construction and operation of 5 MRCs encountered a number of problems, none of which were serious by themselves, but which taken together resulted in substantial delays. Only by September of 1982 had all the buildings for the MRCs been completed, although by that time one of the MRCs had sustained heavy damage in a storm. Construction delays of some centers were mostly attributable to protracted discussions between GOM and the atolls where each center was to be exactly located. In addition, GOM encountered contractual problems with the contractors. Delays in delivery of equipment were also encountered, but in the light of slow construction progress did not appear to substantially affect the project.

5.22 In addition to the 5 centers financed under the project, 5 existing centers had for some time been experiencing operating problems. This was mostly caused by lack of business. At the time of appraisal the existing MRC's were, as a temporary arrangement, operated directly by the engine manufacturer. During appraisal it was agreed that by March 1980, all MRC's would be owned and operated by a government corporation to be established. When GOM established The Maldives Transport and Contracting Company (MTCC), IDA agreed to GOM's proposal to make it responsible for management of the MRC's. The existing and new engines were well maintained and were so reliable that they did not require much repair. Many vessel owners preferred to have their engines maintained in Male, where MTCC's main workshop facilities were located. Many of MRCs better mechanics found more work at better pay in the capital or in the tourism sector. Provision of adequate stocks of small spare parts were not maintained in remote centers which made them uncompetitive with the center in Male. Through the PCC, GOM undertook a management review which proposed measures to improve performance, including a review of MRC pricing policy which would make repairs outside Male more attractive. It was believed that the ageing of engines and rapid growth in engine numbers would ultimately increase demand for MRC services. Some progress has been made since then; however, MRCs still function well below their capacity while shortages of staff persist.

5.23 Navigation Aids Installation. The contract for navigation aids was signed in April 1980. It involved 12 light beacons, 20 reef marker buoys and 100 reef entrance markers. These materials were delivered by December 1980 and the first light beacon was installed at Maahaa (Kaafu Atoll) by a factory technician who arrived in mid March 1981. Two officials from the Ministry of Transport ^{1/} and one from the Ministry of Fisheries were trained while the installation programme was initiated. The technician trained the local personnel to carry out further installation and provide all maintenance of the navigational equipment.

5.24 Under the technical assistance component, a survey of the exact locations of navigation lights revealed that a more effective coverage of Maldives waters could be achieved by installing an additional 19 lights. GOM requested and IDA agreed to carry out a second round of bidding to procure additional navigation lights. Consultants prepared tender

^{1/} The ministry of Transport took over responsibility for the maintainance of lights in 1981.

documents for additional lights and the contract was signed in June 1982. The additional equipment was delivered in May 1983. Due to urgent construction work on the Male airport, in which the Public Works Department and Ministry of Transport were involved, installation of the first set of lights was slow. However, following delivery of the second set of lights in May 1983 and completion of the airport, the pace of installation substantially improved. All but a few of the lights and all the reef markets had been installed by November 1983; the last light was installed on March 10, 1984.

C. TECHNICAL ASSISTANCE

5.25 Objectives of Technical Assistance. The technical assistance component of the project was funded by UNDP, with IDA as executing agency. Its objectives were to: (i) provide specific technical assistance services directly related to the IDA project, such as surveying locations for navigational aids; (ii) train fishermen; and (iii) address development issues of a broader nature, particularly concerning vessel design and preparation of a follow-up project. The technical assistance component did not attempt to address all major development issue of the sector. Its size and complexity was limited; it addressed issues in need of quick remedies related to future development of the sector.

Implementation of Technical Assistance

5.26 Implementation of the component was carried out by the Ministry of Fisheries (MOF) with Assistance of the Maldives Transport and Contracting Company (MTCC), consultants, and private boat builders. Project activities started in October 1979 and were virtually completed by July, 1982. Project staff was recruited internationally and locally.

5.27 Fishermen Training. Two masterfishermen were recruited in August 1980. The start of the training program was delayed in order to let it coincide with the start of the vessel mechanization program financed under the IDA project. The consultants originated from Hawaii, U.S.A., an area more or less comparable to the Maldives in terms of fishing techniques. Training activities started in October 1980 and continued until late April 1981 with a brief interruption in December 1980.

5.28 The training program sought to improve specific aspects of fishing operations as they were affected by mechanization of the fishing vessels. The program was not intended to improve the participants basic fishing skills. The program had a number of beneficial side effects. Being the first of its kind in the country specifically for fisheries, many vessel owners expressed their satisfaction with the assistance provided by the Government. The success of the training program induced GOM to create permanent extension services for the fishing industry, which included a program for on-the-job training. Equipment introduced by the consultants has been in strong demand. The success of the training program in large part reflected the high quality of the consultants who participated in it.

5.29 Design and Construction of Fishing Vessels. The project naval architect was recruited in August 1979, and finalized his task in December 1981. During a number of visits to Maldives he designed and supervised construction of the new vessels. During his absence a Maldivian naval architect supervised construction.

5.30 The focus of the vessel design component on improvement of existing vessels and on the new extended range vessel was the result of an assessment of future developments in the sector which concluded that in the future fish collection, for efficiency reasons, would have to be limited to certain areas with high catches, and that in other areas fishermen would have to adjust their fishing and processing operations either to the market for dried fish or other speciality products, or operate larger vessels able to deliver fish directly to more distant freezing facilities.

5.31 The vessel design, construction and testing component was successful. It encountered some delays but the vessel designs proved highly suitable for Maldivian conditions. While originally five fishing vessels of improved design were contemplated, four were actually constructed because of higher than expected construction costs. The vessels were constructed with financial assistance of UNDP by selected, progressive fishermen, who were made responsible for the test fishing program and the reporting of the results. During construction and testing, extensive contacts between the fishermen community and the naval architect were maintained, and resulted in a number of modifications which were incorporated in subsequently constructed vessels at the new boatyard at Raa Atoll. Acceptance of the design was no doubt increased by one test vessel catching the largest single day catch ever recorded in Maldives. Construction of the long range vessel suffered from delays in delivery of equipment. Initial results of its fishing trials indicate that this type of vessel could profitably operate in certain areas of the country. Fishing trials are still continuing, supported until April 1984 by technical assistance from an expatriate master fisherman. The main purpose of the trials, to establish the technical feasibility of this type of fishing, has been achieved. The experimental vessel has also demonstrated how the next generation of this type of vessel should be improved to enhance its efficiency. MOF plans to continue the trials to better establish the vessels financial feasibility before more vessels are being constructed.

5.32 Navigational Aids Survey. The survey was included in the technical assistance component of the project to determine the exact location of about 10 navigation lights. The survey was completed by February 1980, and identified 19 additional sites for lights comprising a nationwide comprehensive system of navigational aids, which would facilitate night-time navigation outside most of the country's atolls. The survey results were almost immediately used in a request to IDA to expand the navigational aids component of the project. Since substantial savings had occurred in procurement of engines, IDA agreed to finance the additional lights.

5.33 Preparation of Investment Project. From the start of the project GOM engaged in a continuing dialogue with IDA on general fisheries policy. In order to assess the implications of structural sector changes and review their impact on general economic policy, GOM requested IDA to postpone preparation of the Second Fishery Project by a year to September 1981. IDA agreed, and mounted a mission by that date. The mission's report was completed and submitted to GOM in November 1981. The Second Fisheries Project (Cr. 1320ML) was approved by IDA in January 1983.

VI. PROJECT JUSTIFICATION AND IMPACT

6.01 At appraisal, the estimated economic rate of return (ERR) for the project was 100%. The major benefits were expected to be obtained by an increase in export earnings projected at about US\$ 3.3 million annually. In addition, the project would improve the safety and efficiency of fishing and transport operations and would offer GOM a basis from which it could further modernize its fishery sector. The very high rate of return reflected the substantial indirect taxation of the fishing operations at that time.

6.02 The actual financial and economic performance of the mechanized vessels has been satisfactory, largely because many were able to diversify their operations, and because the Government substantially reduced the implied tax on fresh fish sales for export which at present represents only a small fraction of the 1978 levels. In economic terms the project performed satisfactorily. Annex 6 shows the comparison of the overall ERR at appraisal, 100%, and the ERR as of June 1983, 36%. The lower ERR reflects not only higher than appraised costs for navigational aids and technical assistance, but particularly the lower than projected world market tuna prices. World market tuna prices dropped after 1981 following a saturation of the canned tuna market, which was largely the result of over-investment in catching capacity in the major tuna producing countries. The effect was more pronounced for Maldives, which was totally dependent upon a few foreign companies for export of frozen fish. When it became clear that worldwide tuna production increasingly exceeded demand, the companies gave high priority to reduction of their foreign tuna buying operations and this was reflected in the annual price negotiations in Maldives. The recalculated ERR assumes that the 1984 prices paid to the fishermen reflect the border price, which is below prevailing world market prices. The still satisfactory rate of return of the project is largely the result of:

- (i) the positive contribution of the use of fishing vessels for transportation (para 5.11);
- (ii) the use of mechanized fishing vessels in selected areas for dried and salted fish production; and
- (iii) the actual average fish catch per fishing day being substantially larger than estimated at appraisal, particularly for new mechanized vessels.

6.03 The average financial rate of return of a "typical" vessel does not reflect the considerable variation in costs and earnings between vessels. In certain parts of the Maldives, particularly in the central and northern most atolls fishing conditions have been highly unfavorable and vessel owners did obtain a substantial part of their income from transport and tourist services. However, because fishermen, in obtaining a loan for an engine, contractually agreed to use the vessel predominantly for fishing operations, the extent of the diversified use of the vessels was not made known to the Government. The use of mechanized fishing vessels for salted fish production is also uncertain, and has not been included in the recalculated ERR. Consequently, the recalculated ERR is based on uncertain data, and should be treated accordingly.

6.04 Judgements about the project should also take into account a number of non-economic benefits which are difficult to quantify. Several components of the project have been instrumental in generating a number of other benefits:

- (i) The navigational aids survey and the resulting benefits from additional investment in lights has assisted fishing operations and the rapidly developing transport sector. Two coastal passenger and freight carriers included in an investment project financed by the Asian Development Bank have been direct beneficiaries of the investment in lights.
- (ii) The training program demonstrated the benefits of introducing gradual technological changes in fishing operations, laying the groundwork for the establishment in 1983 of a fishery extension service.
- (iii) The success of the four vessels of an improved design generated a substantial demand from private fishermen for additional vessel construction. MOF set up a new boatyard to mass produce the vessels, run by the local naval architect who assisted with supervision of the construction of the original four vessels. Timely funding by KFAED for 100 vessels further assisted in making the yard a success. The yard has been instrumental in introducing more efficient boat building techniques, introduced under the project, and offers year-round employment to a large group of traditional boatbuilders from the area.

VII. PERFORMANCE OF IDA AND THE BORROWER

7.01 The project succeeded in achieving its objectives in large part because of the strong commitment of GOM to effectively implement the project and strong project management, while the technical assistance component benefitted from high quality consultant services.

7.02 IDA's performance was good. The continuity of supervision staff and its technical expertise contributed to the excellent relationship between GOM and IDA, which assisted the Government in reacting to the rapid

developments in the sector. Project supervision was frequent and flexible. A GOM request to have the navigational aids survey executed by a group of local consultants was accepted. Their report was sound; their practical recommendations resulted in an expansion of the navigational aids component. IDA under-estimated the problems of establishing and operating a chain of MRCs; at appraisal it was assumed that a government owned agency would be able to satisfactorily manage MRC operations. A 1981 review of the PCC determined that MRCs should be managed by the newly created MTCC. As a result, some of the issues were resolved. IDA rightly included technical services in the project to assist GOM with procurement but, in retrospect, should have added some management assistance for the MRCs.

7.03 Several factors favorably influenced project implementation. Of these, four are of major importance:

- (i) despite limited staff resources and rapidly expanding responsibilities, MOF has been exemplary in managing the project. Its persistent dedication to project implementation overcame many problems which taken together, might have resulted in substantial project delays;
- (ii) excellent relation between the parties involved in the project have been a major factor assisting execution. Cooperation between consultants and Maldivian staff has been very good;
- (iii) consultants employed by the project, local and expatriate, were well qualified and produced excellent results under difficult circumstances; and
- (iv) project design was simple and flexible. The project was designed to address those aspects of the sector (mechanization; navigational aids and development of new vessels) which were essential for future development, to a large extent regardless of the specific direction of such development. Investments had a high rate of return, necessary in an environment subject to rapid structural changes. Finally, project components were not interconnected, to a large extent each could be executed at its own pace without affecting execution of the others.

7.04 The most important negative factors affecting project execution were delays in procurement and construction. Since this was the first IDA operation in the country, GOM was initially not familiar with IDA procedures, and recruitment of consultants and preparation and clearance of tender documents took more time than expected. Project construction suffered from the effects of the rapid economic growth which Maldives experienced through 1982. Demands on management and staff from the Male boat yard and the DPW to timely complete many competing priority projects sometimes exceeded their capacity. Finally, test fishing operations of the

long range fishing vessel were repeatedly postponed because of persistent delays in procurement of equipment. However, these delays did not inhibit the project from achieving its objectives.

7.05 The rapid changes which have occurred in the traditional fishing community have created social strains and raised questions about the pace at which modern technology and modes of operation should have been introduced. These and other changes have affected the fishing communities which in the past 12 years experienced more technological and social change than in previous centuries. Concern has also been raised about the danger of a gradual loss of knowledge of traditional fishing operations. Unfortunately, the process of gradual technological change envisaged during appraisal could not be adhered to due to worldwide fisheries developments outside the control of the Maldives. Changes were also the result of rapid developments in other sectors, notably tourism and transportation, and would have taken place with or without the project. Nevertheless future fishery projects should, and this is admittedly difficult, make an effort to forecast the social impact of investments where possible.

VIII. CONCLUSION

8.01 This first IDA operation in the country was successful, and achieved its objectives. The project allowed the country to take initial steps to modernize its fishing fleet, providing the essential basis for future development. The project facilitated IDA to become acquainted with one of Maldives most important economic activities, and resulted in substantial follow-up investment. The project proved that fishing projects, if well designed and diligently executed, can be successful, and underscores the need for simple and flexible project design. The project did not attempt to address the sector's entire investment requirements in view of the structural changes taking place, and to avoid forward linkages with uncertain future developments. This approach proved workable, and substantially reduced the risks affecting the project. The vessel design component of the project was timely and its success demonstrates the essential role of vessel design and test fishing in fishery development. Although the project was affected by delays, this did not prevent it from achieving its objectives. Most importantly, the project proved the importance of continuing strong commitment of the government to the project, and of effective cooperation between dedicated government officials, competent technical consultants and IDA staff.

MALDIVES
FISHERIES PROJECT

	<u>Appraisal</u> as of November 1978							<u>Project Costs</u> <u>Actual</u> As of June, 1983						
	<u>Rfs Million</u>			<u>US\$ Million</u>			<u>% of Total</u>	<u>Rfs Million</u>			<u>US \$ Million</u>			<u>% of Total</u>
	<u>Local</u>	<u>Foreign</u>	<u>Total</u>	<u>Local</u>	<u>Foreign</u>	<u>Total</u>		<u>Local</u>	<u>Foreign</u>	<u>Total</u>	<u>Local</u>	<u>Foreign</u>	<u>Total</u>	
<u>Mechanization</u>														
Engines (500) and Spare Parts	1.01	10.61	11.62	0.26	2.70	2.96	76	0.94	7.19	8.1	0.24	1.83	2.07	61
Maintenance and Repair Centers (5)	0.33	0.25	0.58	0.09	0.06	0.15	4	0.79	0.32	1.2	0.20	0.10	0.30	8
Subtotal	1.34	10.86	12.20	0.35	2.76	3.11	80							
<u>Aids to Navigation</u>														
Lights (10)	0.6	0.10	0.16	0.2	0.03	0.05	1							
Markets (100)	/a	0.01	0.01	/a	/a	/a	0							
Buoys (40)	0.01	0.03	0.04	/a	0.01	0.01	0							
Subtotal	0.07	0.14	0.21	0.02	0.04	0.06	1	0.42	1.77	2.2	0.13	0.45	0.58	17
<u>Technical Services</u>	-	0.04	0.04	-	0.01	0.01	0	0.09	1.61	1.7	0.02	0.41	0.43	13
<u>Base Cost Estimate</u>	1.41	11.04	12.45	0.37	2.81	3.18	81	2.25	10.97	13.2	0.59	2.79	3.38	99
<u>Physical Contingencies /b</u>	0.06	0.01	0.07	0.01	/a	0.01	0	-	-	-	-	-	-	-
<u>Expected Price Increases</u>	0.21	1.46	1.67	0.04	0.38	0.42	12	-	-	-	-	-	-	-
<u>Total Expected IDA Financed Project Cost</u>	1.68	12.51	14.19	0.42	3.19	3.61	93	-	9.75	9.75	-	2.48	2.48	73
<u>UNDP Financed Project Cost</u>	0.01	1.10	1.11	/a	0.28	0.28	7	-	1.22	1.22	-	0.31	0.31	9
<u>Total Expected Project Cost</u>	1.69	13.61	15.30	0.42	3.47	3.89	100	2.25	10.97	13.22	0.59	2.79	3.38	100
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/a less than .005.

/b 15% on structures and buildings.

MALDIVES
FISHERIES PROJECT

<u>1. Physical Progress</u> ^{1/}	<u>Key Indicators</u>	<u>1979</u>	^{4/}	^{5/}	^{6/}	^{7/}
			<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>
(a)	number of engines delivered (500)	-	250	500	500	500
(b)	number of engines installed (500)	-	0	102	294	489
(c)	number of MRCs under construction (5)	-	2	2	1	0
(d)	number of MRCs completed	-	0	3	4	5
(e)	number of light structures delivered (31)	-	10	10	10	29
(f)	number of lights installed (31)	-	0	2	6	10
(g)	number of buoys installed (20)	-	0	4	8	20
(h)	number of manmonths of consultants (39) ^{2/}	-	14	26	28	29
<u>2. Financial Progress (Rf Millions)</u> ^{1/}		Rf Millions.....			
(a)	Mechanization program (Rfs 10.2 million)	-	5.8	6.2	6.4	6.4
(b)	Spare Parts (Rfs 1.4 million)	-	1.2	1.2	1.2	1.2
(c)	MRC buildings and equipment (Rfs 0.6 million)	-	0.1	0.4	0.6	0.6
(d)	Navigational aids (Rfs 0.2 million)	-	0.7	0.7	0.7	1.0
(e)	Technical Services ^{2/} (Rfs 0.5 million)	-	0.0	0.0	0.3	0.5
(f)	Technical Assistance ^{3/} (Rfs 1.2 million)	-	0.8	1.1	1.3	1.3

^{1/} Numbers in brackets were expected totals for project; for expenditures, total is base cost plus physical contingencies, estimates refer to actual expenditure, not disbursement.

^{2/} Number of manmonths of consultants had been increased from 26 to 34 allow for technical assistance for procurement of second batch of navigation lights and services of master fisherman to conduct trials of "long range" vessel.

^{3/} UNDP financed.

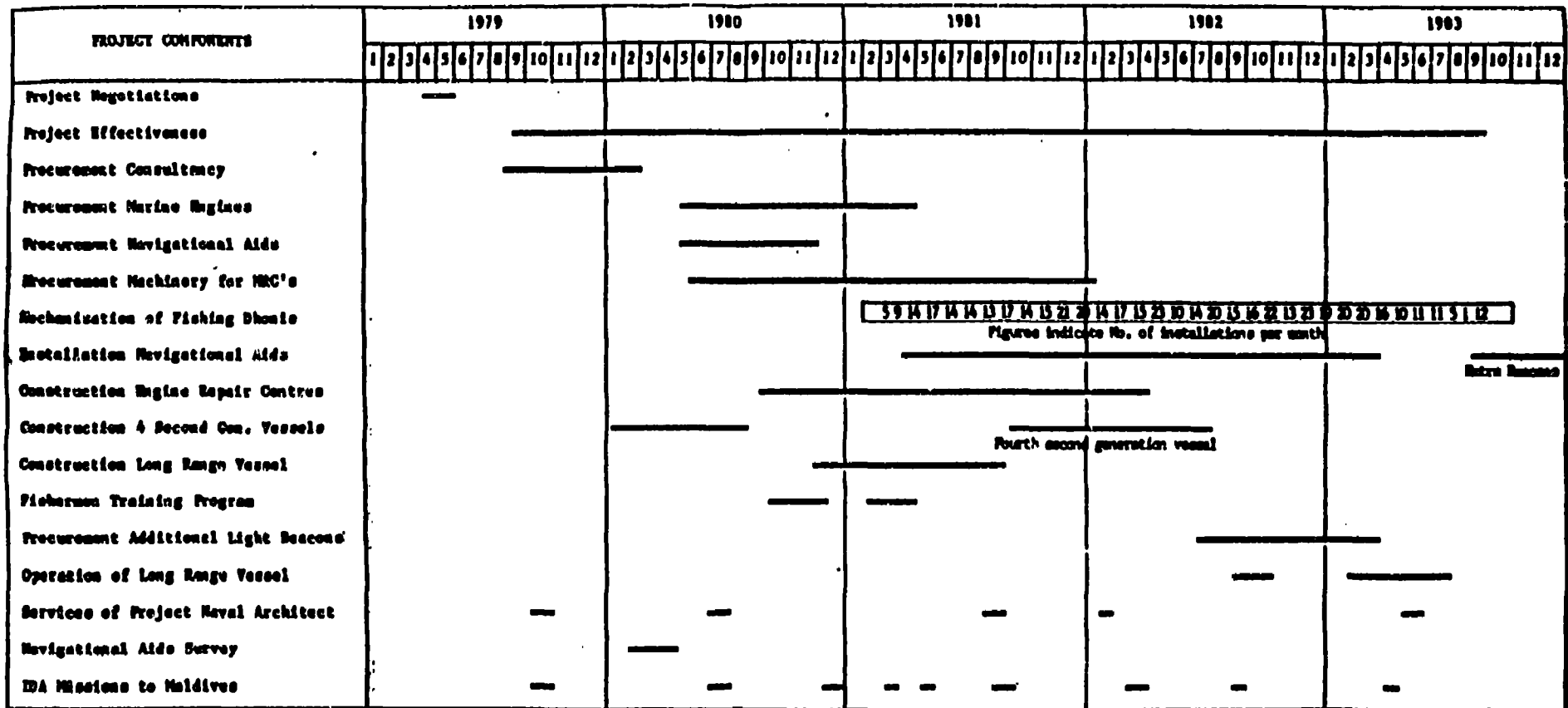
^{4/} December, 1980

^{5/} October, 1981

^{6/} September, 1982

^{7/} December, 1983

IDA MALDIVES FISHERIES PROJECT 907-MAL
PROJECT EXECUTION
TIME SCHEDULE



Source: Government of Maldives.

MALDIVESFISHERIES PROJECTSELECTED FISHERIES STATISTICS, 1978-82

	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
Fish Landings ('000MT)	25.8	27.7	34.6	34.9	30.3
of which: Tuna species	23.5	24.7	30.4	29.4	23.6
Total Registered Fleet (No.)	2273	2341	2436	2626	2878
of which: Mechanized dhonis	548	767	805	944	1066
Total Sector Employment ('000s)	27.2	..	29.2
Fish Exports ('000 MT)	17.3	18.9	22.7	19.9	16.6
of which: Fresh/Frozen	10.7	12.6	14.1	13.8	9.8
Dried Fish	3.9	4.4	6.8	7.2	6.1
Average Export Price (\$/MT) <u>/a</u>	238.0	260.0	338.0	383.0	290.0
Average Procurement Price (Rf/MT) <u>/b</u>	843.0	900.0	1,050.0	1,280.0	1,340.0

Memorandum items:

Tuna World Market Price (\$/MT) <u>/c</u>	730.0	816.0	1,193.0	1,213.0	1,147.0
Proportion of Maldivian Avg. Export Price received by fishermen (%) <u>/d</u>	40.3	46.2	41.4	44.6	66.0

/a Negotiated between Government and foreign collecting companies. Weighted average based on 60% fish above 2 kg. and 40% below 2 kg.

/b Set by Government with reference to Official Accounting Rate.

/c Average skipjack prices U.S. West Coast (San Diego).

/d Procurement price as proportion of export price converted to Rufiyaa at the Market Exchange Rate.

Source: Statistical Appendix Tables 1.4, 3.2, 7.1-7.4; World Bank, Commodities and Export Projections Division, and Mission estimates.

MALDIVES

Annex 5

FISHERIES PROJECT

IMPLICIT TAX ON FISH EXPORTS ^{a/} 1978-82

	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u> ^{b/}
Procurement price (Rf/mt)	843	900	1,050	1,280	1,340
Export price					
\$/mt	238	260	338	383	290
Rf/mt at MER ^{c/}	2,094	1,950	2,535	2,873	2,030
Export volume (mt)	10,673	12,646	14,076	13,790	11,200
Value of exports (Rf m)	22.3	24.7	35.7	39.6	22.7
Cost of procurement (Rf m)	9.0	11.4	14.8	17.7	15.0
Implicit tax revenue (Rf m)	13.3	13.3	20.9	21.9	7.7
Implicit rate of tax (%)	60	54	59	55	34

Memoranda:

Budgetary revenue ^{d/} (Rf m)	11.7	17.5	46.9	73.3	99.9
Implicit tax as proportion of budgetary revenue (%)	114	76	45	30	8

a/ There are elements of implicit tax on exported Maldivian fish and dried salted skipjack, but the volume is relatively small and the proportions which may be considered tax and which the cost of governmental services are not clear. They are not taken into consideration here.

b/ Bank staff estimates; preliminary estimates for 1984 indicate that the tax rate dropped below 10%.

c/ Average market exchange rates: Rf8.8 in 1978, Rf7.5 in 1979-81, and Rf7.0 in 1982.

d/ Budgetary revenue excluding foreign grants.

Source: Government data, and staff estimates.

MALDIVES

FISHERIES PROJECT

Composite Economic Cost/Benefit Analysis

(Rfs '000)

At Appraisal

October, 1978

Periods	ECONOMIC COSTS				ECONOMIC BENEFITS	
	Mechanization	MRCs	Navigationals	Technical	Mechanization	MRCs
	(C 1)	(C 2)	Aids (C 3)	Assistance (C 4)	(B 1)	(B 2)
1	0.0	3,727.2	381.0	792.0	0.0	0.0
2	16,840.0	1,055.3	5.0	1,809.0	13,042.5	975.0
3	17,130.0	822.7	5.0	0.0	25,907.5	1,552.5
4	6,845.0	1,171.4	5.0	0.0	28,060.0	1,920.0
5-10	6,867.5	1,441.4	5.0	0.0	28,060.0	1,920.0
11	18,794.0	1,441.4	5.0	0.0	28,060.0	1,920.0
12	16,633.5	1,441.4	5.0	0.0	28,060.0	1,920.0
13-14	6,867.5	1,441.4	5.0	0.0	28,060.0	1,920.0
15	(4,154.5)	1,241.4	5.0	0.0	28,060.0	1,920.0

Base Economic Rate of Return: 100.6%

As of June, 1983

Periods	(C 1)	(C 2)	(C 3)	(C 4)	(B 1)	(B 2)
1	0.00	2,985.00	0.00	715.00	0.00	0.00
2	8273.00	4,471.00	522.00	715.00	4,431.00	195.00
3	13,781.00	2,985.00	522.00	715.00	10,589.00	930.00
4	13,268.00	1,500.00	522.00	0.00	14,540.00	1,500.00
5	1,000.00	1,700.00	15.00	0.00	14,928.00	1,920.00
6-10	1,000.00	1,700.00	15.00	0.00	14,928.00	2,400.00
11	9,093.00	1,700.00	15.00	0.00	14,928.00	2,400.00
12	5,822.00	1,700.00	15.00	0.00	9,788.00	2,400.00
13	1,762.00	1,700.00	15.00	0.00	3,399.00	2,400.00

Base Economic Rate of Return: 36.4%

MALDIVES

FISHERIES PROJECT

Composite Economic Cost/Benefit Analysis

Assumptions
(As of June, 1983)

The economic analysis has been based on an analysis as similar as possible to that made during appraisal in order to heighten comparability. But, the following assumptions differ from those made in 1979.

(A) Without project situation - sailing vessels

- (i) number of operating days: 75; entire catch would be converted to dried fish at a border price of Rf 2,000 per ton fresh fish equivalent;
- (ii) estimated value of 5 year old vessel: Rf 20,000;
- (iii) sail repairs: Rf 2,000, hull maintenance: Rf 1,000, poles and hooks Rf 550 and bait net of: 250 annually;
- (iv) value of 15 year old vessel: Rf 10,000.

(B) With project situation - traditional mechanized pole and line vessels

- (i) number of operating days: 90; catch per day is assumed to be 220 kg in year 1 and 260 kg in following years. Border price of fish is: Rf 1,100 for those smaller than 2 kg and Rf 1,500 for those over 2 kg; Vessel would be used for transportation for 40 days, earning Rf 9,000 annually;
- (ii) value of 5 year old vessel: Rf 20,000;
- (iii) cost of engine: Rf 15,637.

- (iv) fuel costs: Rf 2.88/l;
- (v) vessel maintenance costs: Rf 2,000 annually;
- (vi) insurance premium: Rf 900 annually;
- (vii) costs of hooks and bait net: Rf 3,194;
- (viii) value of 15 year old mechanized vessel: Rf 12,000;
- (ix) 148 traditional mechanized vessel were introduced in year 2, 196 in year 3 and 81 in year 4.

(C) New pole and line vessels

- (i) vessel operates 90 days annually and catches 354 kg/fishing day; prices as under b (i); vessel would operate 70 days as transport vessel and earn: Rf 9,000 annually;
- (ii) building costs of new vessel: Rf 39,600;
- (iii) cost of engine: Rf 15,637;
- (iv) crew share 40% of gross sales minus fuel and maintenance costs;
- (v) fuel costs: Rf 2.88/liter;
- (vi) vessel maintenance costs: Rf 1,700 annually;
- (vii) insurance premium: Rf 900 annually;
- (viii) equipment costs: Rf 3,194 annually;
- (ix) value of 10 year old vessel: Rf 13,700;
- (x) 25 new vessels have been introduced in year 2, 3 and 4.

MALDIVES - FISHERIES DEVELOPMENT PROJECT

TERMINAL REPORT - UNDP-FINANCED COMPONENT

REPORT FACT SHEET

Country: Maldives

Project Title: Fisheries Development Project

UNDP Project No.: MDV/79/002

Executing Agency: IBRD

Title of Report: Terminal Report for MDV/79/002

Prepared by: Technical Assistance Coordinator
South Asia Projects Department, IBRD

Date: November 15, 1982

CONTENTS

I	Objectives of the Report
II	Activities Carried Out and Outputs Produced
III	Achievement of Immediate Objectives
IV	Utilization of Project Results
V	Findings and Recommendations

MALDIVES - Fisheries Development Project
(MDV/79/002/B/01/042)

I. Objectives of the Project

1.01 The International Development Association (IDA) approved its first fishery investment project in Maldives in 1979 (Cr. 907-MAL). The project finances mechanization of about 500 sailing fishing vessels, 5 engine maintenance and repair centers and navigational aids. The technical assistance component of the project was funded by UNDP and is the subject of this report. The technical assistance component of the project complemented the investment program. Its objectives were to: (i) provide specific technical assistance services directly related to the IDA project, such as surveying locations for navigational aids, and training of fishermen of newly mechanized vessels; and (ii) address development issues of a broader nature, particularly vessel design and preparation of follow-up investment project. Because its size and complexity were limited, the technical assistance component did not attempt to address all major development issues of the sector. Instead, it would focus on issues where quick results could be expected. The project should also not unduly strain the implementation capacity of the Government of Maldives (GOM).

1.02 The technical assistance components' work plan and targets were to:

- (a) train approximately 300 fishermen;
- (b) determine the exact location and survey the sites for the IDA-financed aids to navigation;
- (c) convert two existing mechanized fishing vessels for use in the fisherman's training program;
- (d) design a "second generation" fishing vessel, construct 5 vessels, and monitor the performance of the vessels in trials;
- (e) design a "long range" fishing vessel, construct one prototype and monitor the performance of the vessel in trials; and
- (f) prepare an investment project comprising facilities for export of fish and distribution of fuel to the country's fishing fleet.

1.03 The project has been implemented by IDA. The Ministry of Fisheries (MOF), with assistance of the Maldivian Transport and Contracting Company (MTCC) and private boat builders were responsible for implementation in Maldives.

Project activities started in October 1979 and were virtually completed by July, 1982. 1/ Project staff were recruited internationally and locally.

II. Activities Carried out and Outputs Produced

2.01 Training. IDA recruited two masterfishermen in August 1980. The start of the training program was slightly delayed to make it coincide with the start of the vessel mechanization program financed under the IDA project. The consultants were recruited from Hawaii, an area similar to the Maldives in terms of fishing techniques and level of sophistication of fishing operations. Training activities started in October 1980 and continued until late April 1981 with a brief interruption in December 1980.

2.02 The training program was not intended to improve the participants' basic fishing skills. In Maldives traditional fishing skills are acquired through on-the-job training and are well developed. The training program aimed at improving specific aspects of fishing operations affected by mechanization of the fishing vessel. They include improved bait catching, handling and storage, tactics in approaching fish schools and catching techniques. In addition the training vessel would demonstrate certain limited improvements in the traditional vessel design. Training sessions would be short, the objective being to train a relatively large number of people who would then demonstrate their acquired skills to other fishermen.

2.03 As this was the first training program of this kind in Maldives, no detailed program was spelled out in the project document. The document only assumed that training would be limited to fishermen who would have their vessel mechanized in Male, and that two training vessels would be used, one for bait fishing and one for pole and line fishing. It was left to the consultants and GOM to design details of the program and recruit participants. This approach did have disadvantages. It took time to put the program together, and as a result the start of the training program was slow. However, this approach also produced benefits; it facilitated basic changes in the design and implementation of the program, which were necessary for its successful completion.

2.04 Upon arrival in Male, the consultants agreed to a suggestion of GOM to train fishermen near the atolls where they regularly fish instead of in Male. This was to improve the effectiveness of training and allow the consultants to respond to local differences in techniques. The original consultants proposal specified 12 14-day courses spread over 7 atolls. They ended up visiting 9

Completion of the last "second generation" vessel was reported in August, 1982; fitting out of the "long range" vessel is expected to be completed by November 1982.

atolls, giving 22 courses while fishermen received an average of 2.5 days training. Fifty-six percent (169) of the targeted 300 fishermen received training.

2.05 The changes in the training program were caused by several factors:

- (i) During the first courses, few fishermen volunteered to be trained. The attitude prevailed that they did not need to go "back to school." When the first trainees enthusiastically reported about their training, the attitude changed markedly, and during the second half of the training program the number of candidates exceeded training capacity in some atolls.
- (ii) Because the number of trainees in the first course was small, only one vessel, provided for by MOF, and altered as recommended by the consultants, was considered necessary. When interest in training increased it was too late to add a second vessel;
- (iii) Bad weather, repairs to the vessel and lack of fuel occasionally limited the number of training days.

2.06 The training vessel had a raised deck bullwark, decking over part of the baitwells, an improved system of circulation in the baitwells and used a special glass box to assist in bait fishing. The consultants demonstrated hooks imported from Hawaii and improved chumming with a long stick dipnet. Fishing operations included holding of schools, chumming techniques and fishing.

2.07 The program had a number of beneficial side effects. Many vessel owners expressed their satisfaction with the assistance provided by the Government that made possible the first program in the country specifically for fisheries. Equipment introduced by the consultants has been in strong demand. GOM has received several requests from fishermen communities to continue this type of training. The main benefit has been that the program showed that traditional habits and technology can be improved upon, and that a substantial improvement of catching efficiency is possible at very low costs.

2.08 Design and Construction of Fishing Vessels. The project's naval architect was recruited in August 1979; he completed his assignment in December 1981. During four visits to Maldives he supervised construction of the new vessels; in his absence, a Maldivian naval architect supervised construction.

2.09 Fishing activities in Maldives focus on pole and line fishing for tuna and related species. Traditionally, fishing vessels were limited to single day operations because they lack fish preservation facilities and because the vessels are ill-equipped to keep bait fish for more than one day. Before 1972

fish was processed on-shore into a product called "Maldivé Fish." This involved boiling, salting, smoking and sundrying. When the country started to export frozen and canned fish, quality requirements became more exacting and required vessels to unload the fish within a couple of hours after the catch. Improvements in fish preservation on board were impossible until now because ice production in the country is negligible. When vessels cannot deliver fresh fish to collector vessels, the fishermen have no option but to process the fish into a simple salted product for which demand from Sri Lanka recently has been strong, or into the more elaborate by processed "Maldivé Fish."

2.10 In designing the project vessels, a number of assumptions were made regarding future developments in the sector. The most important one was that, for sometime to come, the existing constraints concerning ice supply and preservation of fish on board fishing vessels would continue, except near planned fish processing complexes (see para 2.21) where ice would be available in limited quantities. Hence, improving the existing mechanized vessel to increase its efficiency was of immediate importance. The vessel should be able to fish during the season for the frozen and canned fish markets in conjunction with fresh fish collector vessels, while during off-season, when no fresh fish collector facilities might be available, the vessel should be able to operate for the dried fish market.

2.11 For construction of the "second generation" vessel, traditional boat building practices and materials would be required in order to make the vessel widely acceptable. This would include constructions on the beach. The vessel should also be roughly the same size as traditional vessels, with traditional hull form. Its main advantages would be its improved efficiency and versatility. Its main features would include full decking, an improved stern and fishing platform, improved engine and rudder controls, and improved fish storage. The vessel would have the option to be equipped with a small ice box, in anticipation that ice would become more widely available. It would be equipped for multi-purpose fishing, including long lining, and have an auxiliary sailing rig to reduce fuel consumption.

2.12 The "long range" vessel is specifically designed for operations from a major fisheries base where ice is available. The vessel can make trips of several days, has an insulated hold, crew quarters and fishing can be done further off-shore or a longer distance from the fishing base. The aim was to give the vessel versatility and independence from fresh fish collector vessels. The vessel would also spend less time traveling to and from the fishing grounds per trip day than traditional vessels, thereby improving its fishing time. The vessel would be based on a new, larger hull, and would preferably be constructed in a special boatyard. Its main features would include an insulated fish hold, navigation and radio communications equipment, and crew quarters. The vessel would also be equipped for multipurpose fishing, and have a line hauler for long-lining.

2.13 The projects' naval architect made a number of recommendations for the training vessels (2.05). These involved improvements which could be simply applied to existing mechanized vessels and which could be easily demonstrated during the training program. These recommendations were subsequently reviewed by the masterfishermen and improvements to one training vessel were made immediately prior to the start of the training program.

2.14 When the naval architect started his assignment in Male, the "second generation" vessel design received most immediate attention. Since the vessel should accommodate traditional design and construction features, the basic lines of a traditional vessel were copied and used to develop the new design. The design process involved lengthy discussions at several design stages with fishermen, boat builders and staff of the boatyard and the Ministry of Fisheries. Since the naval architect visited Male intermittently, it became essential to work out the detailed design in a way which was acceptable and understandable to the boat building crews who would construct the vessels. Plans of major parts of the vessels were lofted full size at the boat building yard, while two models were built to visualize the construction process. In addition, IDA agreed to finance supervision of construction by a trained Maldivian naval architect, who became intimately involved in the design and construction process.

2.15 The project called for construction of 5 second generation vessels, but initially only three parties were willing to accept the new design. Fishermen expressed a reluctance to use the vessels because they were apprehensive about certain technical features, like the decking over the entire vessel, and its higher freeboard. After the first vessels had been constructed, interest grew and the all planned vessels could be constructed. By that time building costs had increased to a level which made it necessary to limit the number of vessels financed under the project to four. The increase of building costs was due to inflation and the slower than anticipated completion of the vessels, and the fact that the vessels were slightly bigger than originally anticipated.

2.16 The performance of the vessels has been excellent. One vessel caught the single largest daily fish catch recorded in Maldivian history soon after its launching. GOM intends to construct up to about 100 second generation vessels to be financed by an external donor, and 10 to 20 vessels under a second IDA Fisheries Project (see para 2.21). Designs of the vessel have been made available to interested fishermen, and several vessels are currently being built on the basis of this design. Interestingly, the design process continues, as boat builders and fishermen make their own improvements to the basic design to adjust it to their requirements.

2.17 Design of the "long range" vessel was started somewhat later. The vessel is substantially larger, and is conceived as a multipurpose vessel, although its primary purpose would be pole and line fishing. The vessel was

constructed of imported wood and was finished in March, 1982; several ancillary fittings still had to be installed by that time. The vessel is expected to be completed in November 1982.

2.18 Construction of the vessel was delayed for the following reasons:

- (i) GOM had difficulty importing the right type of wood. The wood which finally arrived appeared unsuitable and had to be replaced;
- (ii) The Maldives Transport and Contracting Company shipyard at Male has been very busy in the past two years and has been unable to give adequate priority to the construction of vessel. Carpenter crews had to be changed midway during construction; and
- (iii) Delivery of the vessel's engine from India was substantially delayed, causing GOM to cancel the initial order, and buy an engine off the shelf in Singapore. Some parts of this engine were delivered late.

The vessel will start trial fishing soon (see para 4.02), and if these operations are successful IDA will finance a fleet of up to 10 vessels under its Second Fisheries Project.

2.19 Navigation Aids Survey. The survey was included in the technical assistance component of the project to determine the exact location of 10 navigation lights to be financed under the IDA project. After the UNDP project document had been signed, GOM requested that the survey be executed by an ad hoc group of local consultants, including staff from the Departments of Ports and Transportation and MTCC. Since selection of the sites would require intimate knowledge of local circumstances, use of local consultants was considered beneficial and IDA agreed. The survey was completed and a report prepared by February 1980.

2.20 The group identified about 30 sites for navigation lights, which together would comprise a nationwide comprehensive system of navigational aids, which would facilitate night time navigation outside most of the country's atolls. The survey results prompted GOM to request IDA to expand the navigational aids component of the project to 30 lights. Since substantial savings occurred in other components of the IDA project, IDA agreed to finance additional lights, which are currently being constructed and installed.

2.21 Preparation of Investment Project. GOM is engaged in a continuing dialogue with IDA on general fisheries policy matters. Maldives' fisheries sector is going through a period of structural changes with important implication for general economic policy. To review the implications of these structural changes, GOM requested IDA to postpone preparation of the investment project to September 1981. IDA agreed, and mounted a mission comprising seven

consultants, three of which were paid under the UNDP project, and four by IDA. The mission's report was completed and submitted to GOM in November 1981.

2.22 The project prepared by the mission consisted of a fish freezing and storage complex located at Lhaviyani atoll, including fish collector vessels and an ice plant; a fuel distribution system comprising 11 tanks and two tankers, about 20 fishing vessels ("second generation" and possibly "long range" vessels) and technical assistance. Total costs amounted to about US\$12 million. IDA appraised the project in April 1982.

III. Achievement of Immediate Objectives

3.01 The technical assistance project component has succeeded in achieving most of its immediate objectives, although implementation in general has been somewhat slower than assumed when the project was conceived. The fact that most project objectives have been met speaks well of the determination of GOM to pursue the project. GOM's experience with technical assistance is limited and in the course of implementation of this project, MOF was executing several other investment and technical assistance projects and dealing with others in the pipeline. With limited staff resources MOF has been hard pressed in executing its responsibilities.

3.02 Several factors positively influenced project implementation of which three are of major importance: excellent relations between the executing and implementing agency and the consultants, high quality consultants, and flexible project design.

- (a) Excellent relations between the parties involved in the project have been a major factor for successful project execution. Cooperation between consultants and Maldivian staff has been exemplary. Local staff have had a very substantial impact on project output. Their advice on local matters was valuable and reduced the need for time-consuming familiarization of the consultants with the local situation.
- (b) Consultants employed by the project, local and expatriate, were well qualified and have produced good results, often under difficult circumstances.
- (c) When the technical assistance component was conceived, it was considered necessary to build in flexibility to compensate for uncertainties concerning timing of project activities and the pace at which activities were expected to proceed. For example, final design and timing of the training program was decided upon by MOF and the consultants; the naval architect was at liberty to visit the country several times to review vessel construction, and this flexibility has been beneficial.

3.03 Several factors negatively affected implementation of the project, resulting in delays, and a reduction of the number of vessels built and fishermen trained.

- (i) Several components experienced delays, particularly the vessel construction component. Vessel construction was slow because of (a) limited initial interest of fishermen in the program, delaying construction of at least one second generation vessel, (b) delays in the import of boat building wood, resulting in a late start of the construction of the long range vessel, and (c) inability of the MTCC boatyard to give construction of the "long range" vessel the priority it needed because of other, more pressing, commitments. Preparation of the investment project and training of fishermen were delayed on purpose to allow GOM to assess sector developments and to allow the training program to begin with the start of the mechanization program.
- (ii) Initial reluctance of fishermen to participate in boat building and training activities slowed implementation and reduced planned participation. In both cases the project was able to generate sufficient interest following demonstration of its activities.
- (iii) Cost increases caused the project to reduce the number of second generation vessels from 5 to 4. Since the start of the project, inflation in Maldives has been between 10 and 20 percent annually. Since the project budget did not have a contingency provision, and additional UNDP funds were not available, a reduction of the number of vessels was the only option.

IV. Utilization of Project Results

4.01 As indicated in the previous paragraphs, several components of the project have already been used.

- (a) The navigational aids survey resulted in a substantial expansion of investment in navigational aids. This will assist the rapidly developing transport sector to improve its efficiency while providing improved safety to the fishing sector. One investment project financed by the Asian Development Bank comprising two coastal passenger and freight carriers will be a direct beneficiary of improved navigation facilities. The lights will also specifically assist operations of long range vessels.
- (b) The training program improved efficiency of fishing operations, and several techniques are currently being applied by fishermen. The objective of the training program to demonstrate specific improvements in fishing operations to fishermen was successful.

The training program has caused the fisherman to request GOM for additional training and extension services. GOM is now setting up a small extension unit which will continue the work started by the training program. Its 5 fisheries officers will make frequent field visits and conduct short training programs aimed at improving specific aspects of fishing operations.

- (c) The "second generation" vessels have successfully demonstrated their technical advantages. Additional construction by private parties shows that demand for this type of vessel does exist, and that operations appear financially viable.
- (d) The "long range" vessel will have to finish its fishing trials before a judgment on its financial and technical feasibility can be made.
- (e) The vessel construction program has given GOM valuable experience in organizing a vessel construction workshop. As a result, GOM is planning to set up at least one boatyard, that will mass produce wooden fishing vessels. Initially "second generation" vessels will be constructed and sold through an expanded credit scheme developed under the IDA investment project. The boatyard would be located on an island from which many boat building crews originate. It is expected that the boatyard would be able to produce vessels cheaper than under traditional boat building arrangements, as the costs of housing and feeding building crews, who traditionally migrate to the island of the prospective vessel owner until the vessel is completed, would be avoided. In addition, the yard would construct with imported wood, thereby avoiding the time consuming and costly process of collecting individual pieces of wood from surrounding islands.

4.02 GOM has prepared a cruise plan for the "long range" vessel. A crew is being assembled and GOM will receive funds from the IDA project to hire an expatriate masterfisherman to assist in execution of the cruise plan. The results of the fishing trial should govern the follow up action required. The vessel might either be modified, or continue in its present capacity. Since design of a new type of fishing vessel is a continuing process, additional modified vessels might have to be constructed before a completely satisfactory design is found. However, the first prototype constructed under the project should be able to indicate what adjustment to the design and fishing methods are necessary.

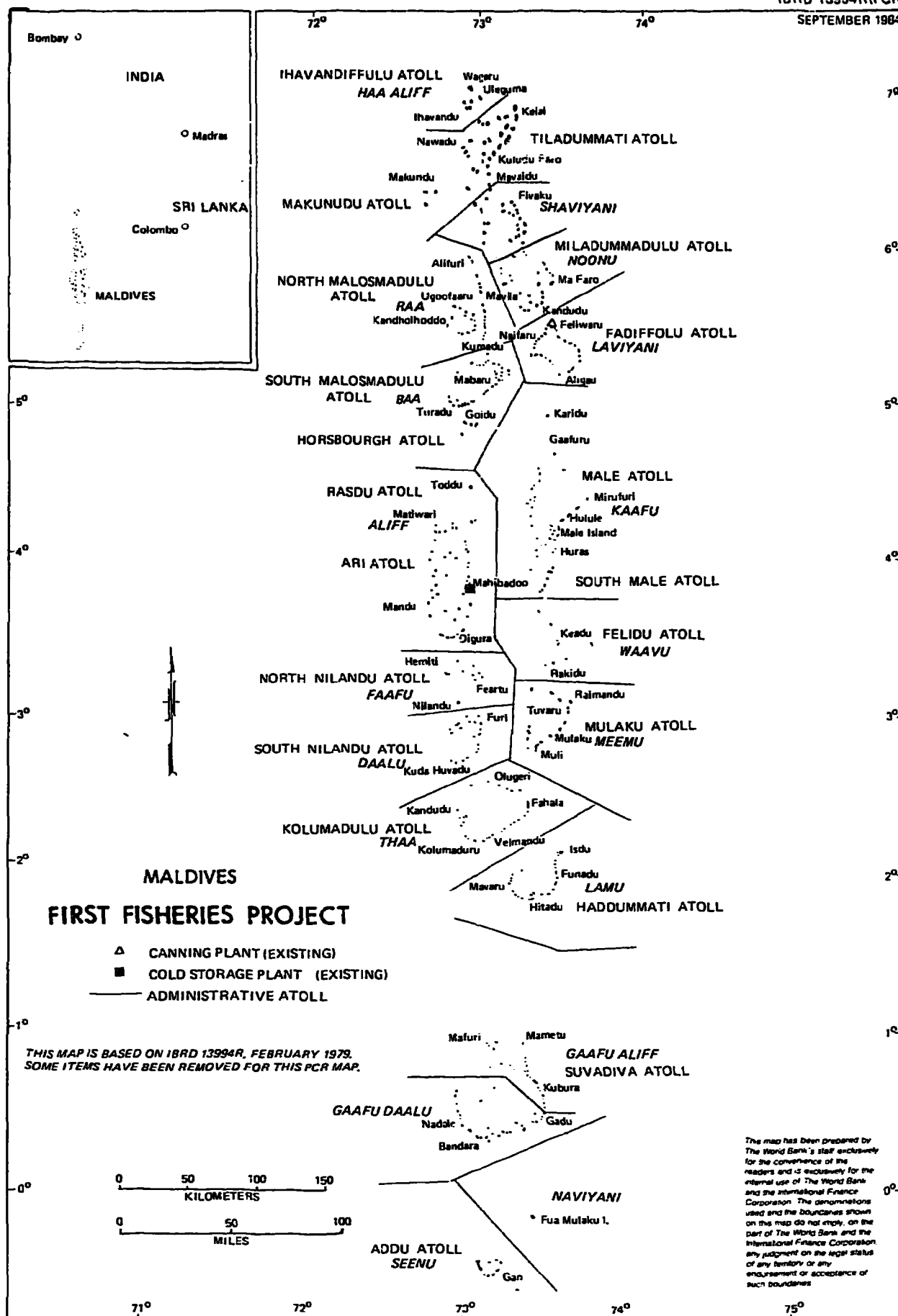
V. Findings and Recommendations

5.01 Technical recommendations by the consultants have been made in the following reports:

- (i) Skipjack Training Program Report, Second Half of Project. May, 1981.
- (ii) Report for Site Survey for Installation of Navigational Aids. February, 1980.

Recommendations by the naval architect have been made in a number of Annexes to his designs and letters to the Government.

SEPTEMBER 1984



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