JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

MINISTRY OF AGRICULTURE

MALAYSIA

THE FEASIBILITY STUDY ON THE PILOT PROJECT FOR IMPROVEMENT OF FISH MARKETING AND DISTRIBUTION SYSTEM

FINAL REPORT

MARCH 1993

SYSTEM SCIENCE CONSULTANTS INC.

PREFACE

In response to a request from the Government of Malaysia, the Government of Japan decided to conduct a Feasibility Study on the Pilot Project for Improvement of Fish Marketing and Distribution System in Malaysia and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Malaysia a study team headed by Mr. Tateo Kusano, System Science Consultants Inc. three times between March 1992 and January 1993.

The team held discussions with the officials concerned of the Government of Malaysia, and conducted field surveys at the study area. After the team returned to Japan, further studies were made and the present report was prepared.

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

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

March 1993

Kensuke Yanagiya
President
Japan International Cooperation Agency

March 1993

Mr. Kensuke Yanagiya
President
Japan International Cooperation Agency
Tokyo, Japan

Dear Mr. Kensuke Yanagiya:

Letter of Transmittal

We are pleased to submit to you the report on the Feasibility Study on the Pilot Project for Improvement of Fish Marketing and Distribution System in Malaysia. The report contains the advice and suggestions of the relevant authorities of the Government of Japan and Government of Malaysia as well as the formulation of the above mentioned project. Also included are the comments made by the Steering and Technical Committees of the Government of Malaysia during discussions on the draft report which were held in Malaysia.

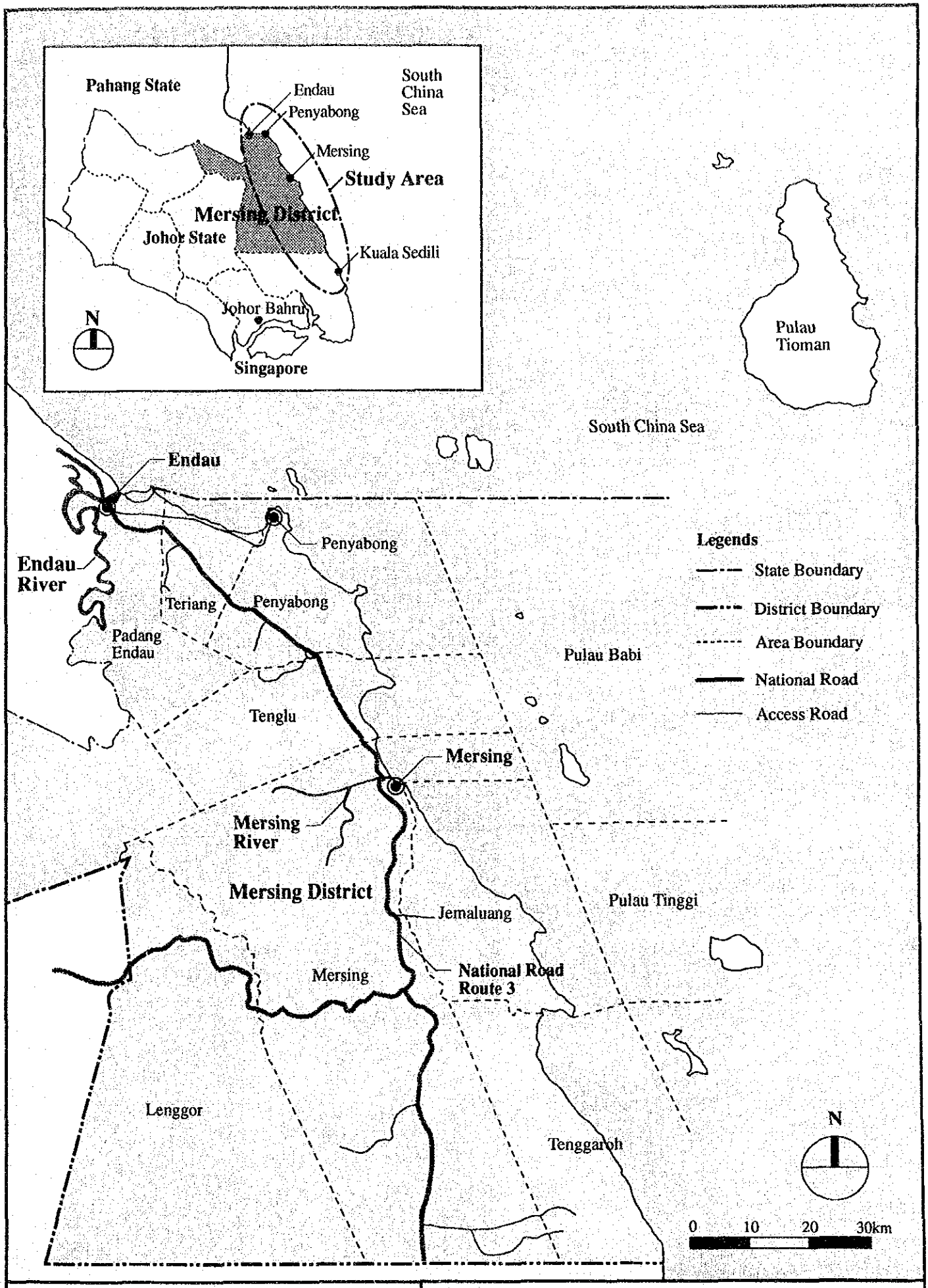
This study has been conducted by System Science Consultants Inc., based on a contract with JICA, from March 19, 1992 to March 19, 1993. In this study, we formulated a M/P and studied the feasibility of the fish marketing and distribution facilities in East Johor as a model case for improving the existing fish marketing and distribution system in Malaysia

In view of the urgency of developing the marketing and distribution system in Malaysia and of the need for socio-economic development of fishermen community in Malaysia, we recommend that the Government of Malaysia implement this Project as a priority.

We wish to take this opportunity to express our sincere gratitude to the relevant officials of JICA, the Ministry of Foreign Affairs and the Ministry of Agriculture, Forestry and Fisheries in Japan. We also wish to express our deep gratitude to the concerned officials of EPU, MOA and LKIM in Malaysia and Embassy of Japan in Malaysia for their close cooperation and assistance extended to the team during the study.

Very truly yours,

Tateo Kusano, Team Leader,
The Feasibility Study on the Pilot Project for Improvement
of Fish Marketing and Distribution System in Malaysia
System Science Consultants Inc.



Mersing District in Study Area

GOVERNMENT OF MALAYSIA
THE FEASIBILITY STUDY ON THE PILOT PROJECT FOR IMPROVEMENT OF FISH MARKETING AND DISTRIBUTION SYSTEM IN MALAYSIA
JAPAN INTERNATIONAL COOPERATION AGENCY

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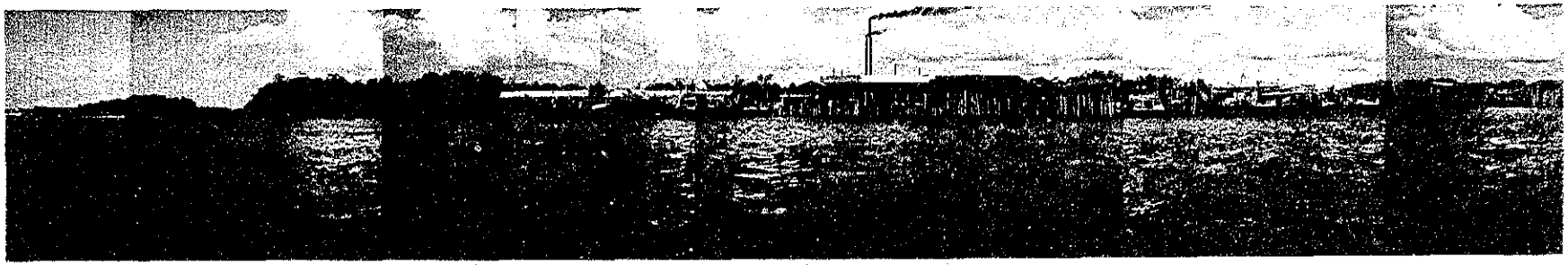

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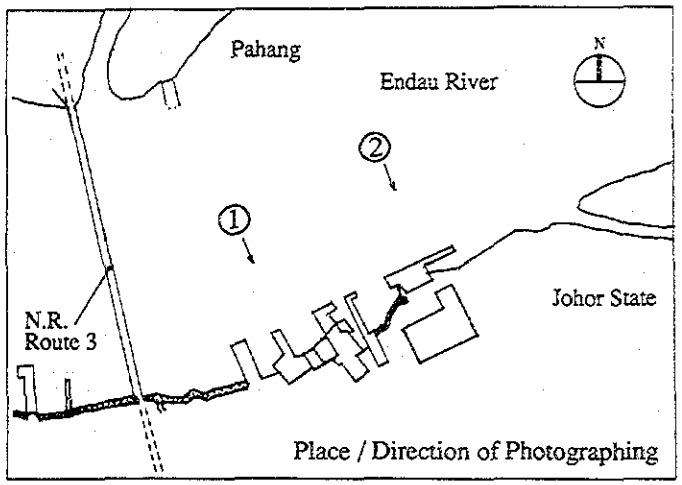
Project Site taken from Endau River



SUMMARY

1. Introduction

(1) Background of the request

In order to improve fishermen income and the efficiency of the fish marketing system, the Government of Malaysia requested the Government of Japan to conduct a study on improvements of the existing fish marketing system. In compliance with this request, JICA implemented a nationwide development study entitled, "The Study on Fish Marketing and Distribution System in Malaysia", from November 1989 to March 1991.

Based on the findings of this study, a proposal on improvements of fish marketing facilities including fishing port facilities and measures to strengthen the economic and credit functions of the AFA was submitted. Within this framework, east Johor was selected as the model area for implementation of a pilot project to carry out the planned improvements.

The Government of Malaysia requested a F/S study on implementation of the pilot project to the Government of Japan, whereupon JICA dispatched a preliminary survey team and S/W mission. On December 4, 1991 representatives from both governments exchanged an agreement on the S/W for "The Feasibility Study on the Pilot Project for Improvement of Fish Marketing and Distribution System in Malaysia". On the basis of this agreement, JICA dispatched a study team to implement the F/S in March 1992.

(2) Objective of the study

The objective of the study was to implement a F/S on improvements of the existing fish marketing system in the study area of east Johor, including its institution/organization and fishing port including its related facilities.

(3) Study area

The study area covers the eastern region of Johor state.

(4) Study approach

The study was divided into two phases. During Phase I a regional M/P was formulated on the fish marketing system in the model area of east Johor; and an appropriate site for the Pilot Project was selected.

During Phase II the feasibility of the Project was determined through a detailed study of the pilot project site selected in Phase I and its surrounding area.

2. Analysis of Present Conditions

2.1 Present Conditions in Fish Production

(1) Fishery resources

The coastal waters contain a high level of nutrients received from the inflowing rivers; and subsequently, the environment is highly suited to the growth of fish fry. Fish spawn in coastal waters and fry reach maturity in offshore waters to become high-priced fish.

In recent years, over fishing by small trawlers has become prominent and as a result, fish catch volume has declined. Furthermore, due to the predominance of trawling, more than half of the fish harvested by trawlers is low-priced trash fish which is used for fish meal and not food fish. The effects of this trend will be to significantly lower the value of fishery resources. Formulating measures for fishery resource management such as curbing trawling in coastal waters and regulating fishing net size, are essential.

(2) Fish production in east Johor

Kuala Sedili, Mersing, and Endau located in the eastern area of Johor state contain fish landing facilities which developed along the rivers flowing into the South China Sea; and its fishing industry is presently undergoing modernization.

There was a decline in fish production from 1988 to 1990; and although the total number of fishing boats has remained unchanged, there has been a rapid increase in the number of large fishing boats of 70 tons or more. Although investments in large fishing boats are growing, fishing efficiency has dropped and fish catch volumes have not been high enough to make a return on the investments. This phenomenon is due to over fishing of resources.

(3) Fish production in the Mersing district

The fish landing volume for the entire region of east Johor in 1990 was approximately 75,000 MT. Of this volume, the fish landing volume of the Mersing district was about 45,050 MT or 60 percent of the total fish landing volume of the study area.

Number of Licensed Fishing Boats with In-board Engine and Fish Landings in East Johor (1988-90)

Unit: Boats

	1988	1989	1990
1. Number of Boats			
(1) Class A (< 25 tons)	633	609	605
(2) Class-B (25-39 tons)	107	110	111
(3) Class-C (40-69 tons)	176	175	165
(4) Class-C2 (>70 tons)	37	44	69
Total	953	938	950
2. Fish landings (MT)	68,000	77,000	75,000

Remarks: Including trash fish
Source: DOF Mersing

Fish Landings by Fishing Gears in Mersing District (1990)

Unit: MT

	Endau	Penyabong	Mersing	Total
Trawl	28,198	923	10,850	39,971
Purse seine	1,867	0	1,105	2,972
Other gears	327	140	1,640	2,107
Total	30,392	1,063	13,595	45,050

Remarks: Including trash fish
Source: DOF Mersing

Number of Licensed Fishing Boats with In-board Engine in Mersing District (1990)

Unit: Boats

	Endau	Penyabong	Mersing	Total
Class-A	29	25	152	206
Class-B	62	-	35	97
Class-C	88	-	21	109
Class-C2	39	-	12	51
Total	218	25	220	463

Source: DOF Mersing

In the Mersing District fish is landed at Mersing, Endau, and Penyabong. Fish landings are concentrated at Endau; at each fish landing site the fishing season is divided into the lean fishing period which falls during the monsoon season of December to February, and the peak fishing season from March to October.

Trawling is the predominant form of fishing in the Mersing District, followed by purse seines. In addition, small-scale petty fishing using traditional fishing methods such as gill nets, cages, dip nets, hook and line, etc., is found.

2.2 Present Conditions in Fish Marketing System

(1) Fish landing

Food fish is landed at private jetties and at the LKIM complexes. However, the volume of food fish landed at the LKIM complexes is only about 18 percent of the total volume in Mersing district. The scope of the existing LKIM complex at Endau is small and only 7.3 percent of the total fish landing volume of Endau is landed there.

(2) Supply and demand of fish products and fish flow

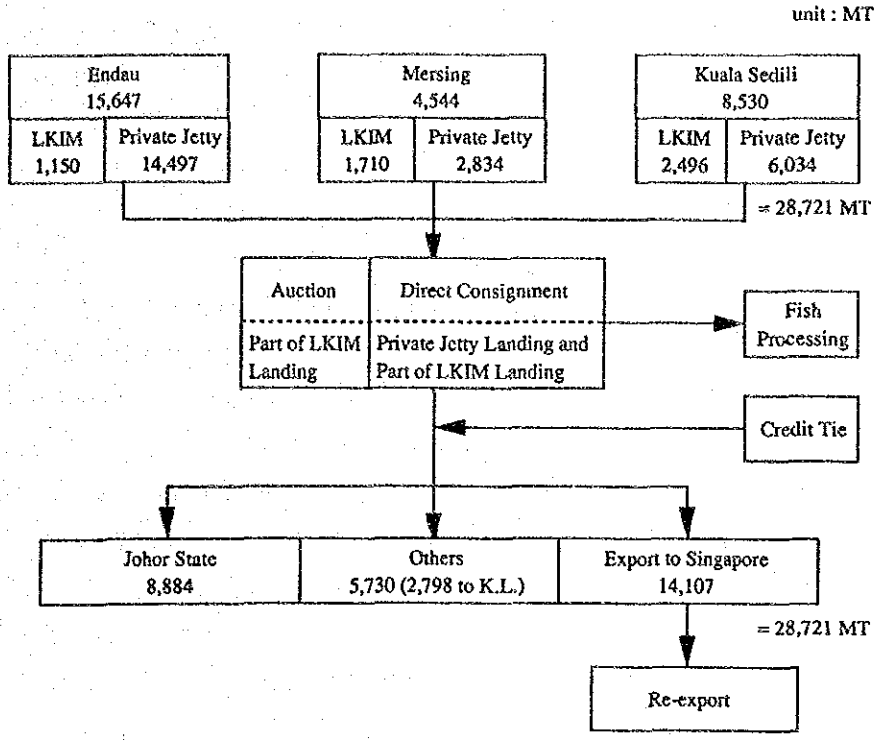
The growing demand in Singapore for fish products is large. The export ratio of fish products earmarked for Singapore has been approximately one half of the total fish landing volume of the study area from 1990 to the present; and in recent years, this ratio is increasing. In future, the potential of the study area to evolve into a general fisheries base for exported fish to Singapore or other foreign markets via Singapore, is very promising.

If the facilities and the level of service at the LKIM complexes are improved, many of the fishermen will transfer their fish landings from the private jetties to the complexes. In addition, fish auctions would be rapidly promoted by fish traders and the AFA, as in the case of the Kuantan LKIM complex in Pahang state.

(3) Fish marketing, price mechanism, and income distribution

Much of the fish landed in the area is destined for the large markets in Singapore, Kuala Lumpur, Johor Bahru, etc. The credit ties between the wholesaler in each consumption area and the fishermen in the study area has hindered the principles of free competition in marketing.

However, since the demand at all the domestic markets and Singapore is flourishing, the fishermen have capitalized on their advantage in their relationships with wholesalers in the consumption areas and consequently, the ties between them are comparatively slack. However, the earnings of fishermen without credit ties is rather high.



Source: Field Survey Phase 1 (The Feasibility Study on the Pilot Project for Improvement of Fish Marketing and Distribution System in Malaysia, April 1992)

O/D Flow chart of fish from East Johor to the Consumption Area (1990)

2.3 Present Conditions of Fish Marketing Information System (FMIS)

(1) Summary of existing FMIS

1) Public information system

Presently there are two information systems on fish marketing which collect data on fish landing volumes, fish price, etc. operated by the DOF and LKIM.

2) Private information system

The FMIS in the private sector is made possible through the contributions of the LKIM, the AFA, fishing boat owners, captain, and fish traders.

Class B, C, and C2 fishing boats use portable telephones as their means of communication at sea, while none of the class A fishing boats have electronic communication devices. On land, the fish landing sites and the wholesale markets exchange information by telephone and the use of facsimiles and wireless radios is rare.

Before fish is landed, information is exchanged on fishing and weather conditions, on emergencies, etc. among the fishing boats at sea. Fishing boats currently having portable telephones seldom use them due to high calling rates, poor connections due to obstructing islands, and distances that surpass the dialing range of the telephone.

As they approach the fishing port on their return trip, the fishing boats will relay information on the expected date and time of their arrival, fish catch volume, and fish species to their designated contact at the fish landing site (fishing boat owner, fish trader, etc.). In turn, the fish traders will telephone their contacts at each wholesale market to collect information on the supply and demand of the market, estimated fish price, etc., whereupon they will determine the destination of the fish catch after its landing.

(2) Limitations to introducing a public information system on fish transactions

The introduction of a public information system that will provide daily information on fish transactions will be resisted by fish distributors, since it will destroy the competitive status quo. The parties most in favor of this intervention are the ordinary fishermen and the AFA.

It is important to note that the objectives of a public FMIS is to achieve an impartial fish pricing structure and fair income distribution between the fishermen and wholesalers.

The nationwide FMIS currently in planning at DOF/LKIM is not effective in this respect. In view of current conditions that exist in fish marketing, it is more appropriate to expand the existing FMIS of the private sector to include the AFA and ordinary fishermen, and thereby stimulate the competition. Therefore, rather than coupling the existing public information system on the private sector, it would be more practical to improve the locally accepted information system.

2.4 Present Conditions in Institution/Organization

(1) Credit system

There is an established system of BPM loans granted for boat construction; and under this system, large fishing boats are eligible to receive capital for boat building and fishing operations with relatively few impediments.

In contrast, it is extremely difficult under the existing system to obtain loans for operating expenses of less than the minimum RM2,000 fixed by BPM. As a result, informal loans by fish traders are available to fishermen. Small and medium fishermen can always obtain interest free loans from fish traders for their fishing operations or daily commodities; and it is a highly convenient system for fishermen. In turn, fish traders unfailingly collect their loans by offsetting the amount from the fisherman's fish catch. Although this is a safe and reliable system for both parties, fishermen incomes are without a doubt, suppressed on the lower end of the income scale, as shown in the fish marketing price mechanism.

(2) Fishermen's associations

1) Area Fishermen's Association (AFA)

In the study area, the membership ratio of AFA fishermen is 93 percent in Mersing, 28 percent in Endau, and 23 percent in Kuala Sedili. The extremely low membership ratio of the AFAs in Endau and Kuala Sedili is due to the large number of fishermen who are automatically eliminated from the association because they do not abide by AFA regulations. The members of the AFA are mainly ordinary fishing crew members, who have very little interest in its activities.

2) Although the largest source of revenue for the AFA is the sale of diesel oil, the association is losing its customers to other private suppliers. As a result, the utilization ratio of AFA supplied diesel oil has conspicuously dropped over the past few years.

3) Fish auctions have either been terminated and replaced by direct consignments or they have been taken over by the LKIM, due to weak AFA management of fish auctions.

4) AFA members are composed of fishermen, boat owners, fish traders, and processors. Consequently, the interests within the association are complicated; and it is difficult to aggressively carry out AFA activities due to a lack of total member consensus.

5) AFA is currently operating with the support of LKIM, due to the shortage of middle management staff and the lack of a comprehensive training program to foster such personnel. It will be necessary to implement such an educational program in the near future, in conjunction with privatization measures.

6) AFA does not play any contributing role in the protection of fishing grounds and its fishery resources. In the distant future it will be necessary to grant the AFA exclusive use of rights in fish resources under the supervision of DOF.

2.5 Present Conditions in Fish Marketing Facilities

(1) Natural conditions

A survey on the natural conditions of the Endau River, the most appropriate site for construction of a fishing port, was carried out and the findings are presented below.

1) According to a sounding of the Endau River, there were no exceptional constraints in the construction of a fishing port. If proper measures are taken in the port structure, damage from the effects of wind and waves such as siltation and impairment of the quay wall and fishing boats, can be minimized. The basic concept underlying port planning is to construct the port without significantly changing the natural configuration of the river.

2) Among the rivers of east Johor, Endau River was the most appropriate, in terms of required water depth. However, since the navigational channel near the river mouth is restricted during ebb tide, it is necessary to revise navigational safety measures for fishing boats.

(2) Fish marketing facilities

1) Fish landing facilities

Fish landing activities are concentrated at the private jetties. However, in recent years reforms in LKIM complex operations have progressed and the number of fishermen utilizing the complex has grown. The utilization ratio of LKIM complexes in 1991 was 9 percent in Endau, 48 percent in Mersing, and 31 percent in Kuala Sedili. The poor facilities of the Endau LKIM complex has resulted in the majority of the fishermen to rely on private jetties.

2) Ice plant facilities

The use of refrigerated sea water cooling system (RSW) units has become widespread among fishing boats and this has decreased the use of ice at sea. Ice is mainly used on land. As a result, there is a surplus in ice production and at the present time, it is not necessary to construct new ice plant facilities. However, supplementary facilities are required during the peak fishing season when there is a shortage of ice.

3) Fish processing facilities

There are two freezing plants for cuttlefish in the study area, but only one is in operation. Moreover, there is no processing plant for cuttlefish in Kuantan in the neighboring Pahang state; and cuttlefish landed there is exported to Thailand for processing. In addition, it is necessary to improve processing technology for salted fish, in order to produce a higher quality product for exportation and the incoming tourists. There is a large fish meal plant along the Endau River, and in view of the need to protect fishery resources, new facilities are not required. The study area and its offshore waters have the most abundant source of thread fin bream which is suited to surimi production in peninsular Malaysia.

4) Fishing boat construction and repair facilities

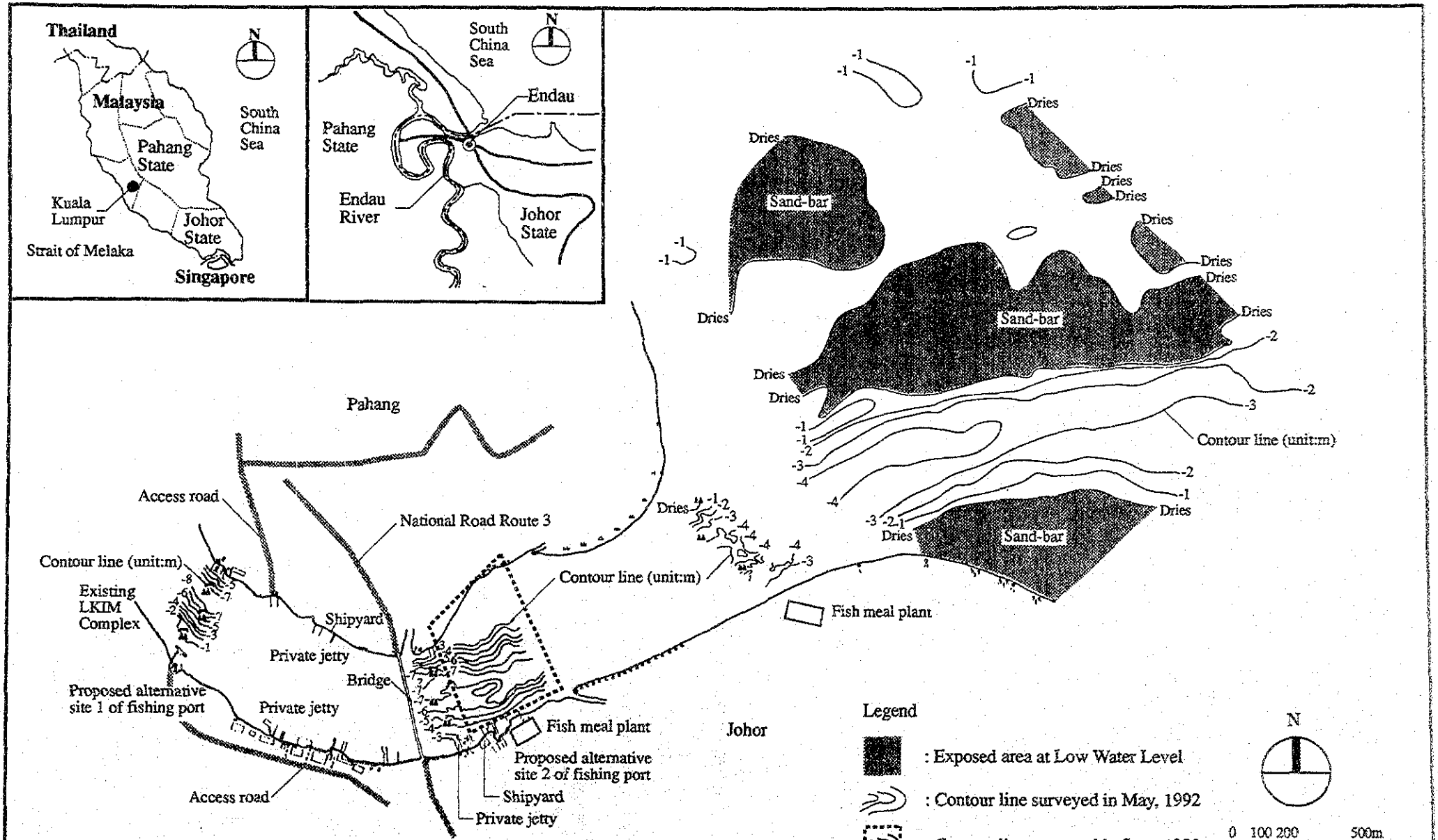
Although existing private fishing boat construction and repair facilities are sufficient to meet current needs, there are no private repair facilities for engines and electrical instruments. Therefore, a comprehensive facility with both boat construction and repair functions is needed.

5) Live fish marketing facilities

Live fish marketing facilities need to be modernized, in order to meet the demands in Singapore and the growing tourist industry.

6) Related infrastructure

Electricity, water supply and roads in the study area are well developed. The existing infrastructure will not impede construction and operation of the new fishing port.



Hydrography of Project Area

GOVERNMENT OF MALAYSIA
THE FEASIBILITY STUDY ON THE PILOT PROJECT FOR IMPROVEMENT OF FISH MARKETING AND DISTRIBUTION SYSTEM IN MALAYSIA
JAPAN INTERNATIONAL COOPERATION AGENCY

3. Future Projections

3.1 Projected Fish Landing Volume and Number of Fishing Boats

(1) Fish landing volume

1) Country total

Fish landing volume for the year 2010 was provided by DOF.

2) East coast of peninsular Malaysia

Recent fish landing volumes on the west coast of peninsular Malaysia have been markedly declining, due to over fishing of fishery resources. However, with improved management of coastal resources, the fish landing volume on both the east and west coasts are expected to increase favorably.

3) Study area

The relative fish landing ratio of each state on the east coast of peninsular Malaysia is not expected to change for the foreseeable future because of the balanced development in the fishery sector.

4) Mersing district

It is projected that improvements to the fishing ports and its related fish marketing facilities, instituted by the Pilot Project, will progress rapidly in the Mersing district. The fish landing ratio of this district will increase rather rapidly compared to the other areas in east Johor. In particular, Endau and Penyabong will rapidly centralize their fish landing volume within the district.

(2) Number of fishing boats

1) The objective is to meet the fish landing volumes targeted in each annual plan. Fishing efficiency is anticipated to rise with the advent of large, modern fishing boats. Thus CPUE was estimated and the required number of fishing boats was fixed.

2) In order to protect fishery resources, the number of Class A trawlers will be gradually reduced; and after the 2000, they will have completely shifted to other fishing methods.

3) Measures that will increase the production of demersal and pelagic fish will be implemented to underscore the emphasis on fishery resources.

4) The fishing ports of Mersing and Kuala Sedili will accommodate small to medium fishing boats (class A, B, and a few C); class C2 fishing boats will all be based at the

Endau fishing port; and those currently at Mersing will be relocated to Endau. All Class A fishing boats presently at Endau will be transfered to Penyabong.

(3) Projections

1) Fish landing in Mersing district

Unit: MT

	1990		1995		2010		2020	
1. Mersing Dist.								
1) Penyabong	1,063	(2%)	2,600	(5%)	3,750	(5%)	4,800	(5%)
2) Mersing	13,595	(30%)	13,000	(25%)	18,750	(25%)	24,000	(25%)
3) Endau	30,392	(67%)	36,400	(70%)	52,500	(70%)	67,200	(70%)
Sub-total	45,050	(100%)	52,000	(100%)	75,000	(100%)	96,000	(100%)
2. Other Area	30,219		28,000		25,000		24,000	
East Johor	75,269		80,000		100,000		120,000	

Remarks: Including trash fish.
Source: 1990 Data from DOF, Mersing

2) Fishing boats in Mersing district

Unit: Boats

	1990	1995	2010	2020
1. Endau				
Class-A	29	15	0	0
Class-B	62	55	20	20
Class-C	88	70	95	100
Class-C2	39	89	130	150
Sub-total	218	229	245	270
2. Penyabong				
Class-A	25	20	40	60
Class-B	0	25	50	80
Class-C	0	0	0	0
Class-C2	0	0	0	0
Sub-total	25	45	90	140
3. Mersing				
Class-A	152	105	100	100
Class-B	35	135	125	120
Class-C	21	50	60	70
Class-C2	12	0	0	0
Sub-total	220	290	285	290
Total	463	564	620	700

Source: Data of 1990 from DOF, Mersing

3.2 Projected O/D Volume of Fish Products

(1) Concept underlying projections

The projection of fish landing is based on the assumption fishery resource management is implemented. In East Johor, fish landing is more or less stable, therefore this trend is considered in the projections.

1) Fish landing volume of food and trash fish

The ratio of trash fish was approximately 50 percent based on 1990 conditions. It is projected that this ratio will gradually decline to 25 percent by the year 2010. Subsequently, the landing volume of trash fish is estimated to remain approximately at present levels.

2) Fish landing volume of LKIM complex

The fish landing volume was projected for the LKIM complex and private jetties according to the following assumptions.

a) 1990

The fish landing for 1990 is reflected in the actual landed volume.

b) 1995

In 1995 the new fishing port and its fish marketing facilities at Endau will be completed and its organizational and institutional reforms will be in progress. In addition, organizational and institutional reforms will have begun at the other LKIM complexes. As a result, approximately 50 percent of the fish landing volume of Endau will be landed at the new fishing port; and at Mersing, 60 percent of the fish landing volume will be landed at the LKIM complex.

c) 2010

Implementation of the new fish marketing system will be nearly completed and facilities will have increased by this target year. The utilization rate of the new fishing port and the LKIM complexes will have reached 90 percent of total landings.

d) 2020

Private jetties will have been completely demolished and the new fish marketing system will be in full operation.

3) Projected supply/demand (S/D) and origin/destination (O/D) volume

a) Fish production volume

Although such factors as limited fishery resources, improved fishing technology, etc. were taken into consideration, basically fish production will increase with the growing demand.

b) Fish consumption volume

Although per capita income is increasing, income elasticity in fish consumption remains low. Due to this factor, only the growth in domestic demand, in compliance with the rise in population, was projected.

c) Fish import volume

There is no imported fish in the study area, as it is an area with a fish production surplus.

d) Fish export volume

The growth in fish export volume from the study area to neighboring Singapore is steadily increasing and this trend is anticipated to continue in the future.

Marine Landing Projection at LKIM Complex and Private Jetty in Endau and Mersing (1990-2020)

Unit: MT

	Marine Landing	Trash Fish	Food Fish	Without Project Landing at		With Project Landing at	
				LKIM	Private Jetty	LKIM	Private Jetty
Endau							
1990	30,392	14,892	15,500	1,150	14,350	1,150	14,360
1995	36,400	14,560	21,840	2,184	19,656	10,920	10,920
2000	44,100	13,230	30,870	3,087	27,783	21,609	9,261
2010	52,500	13,125	39,375	3,938	35,438	35,438	3,938
2020	67,200	16,800	50,400	5,040	45,360	50,400	0
Mersing							
1990	13,595	6,558	7,037	1,710	5,327	1,710	5,327
1995	13,000	5,200	7,800	3,900	3,900	4,680	3,120
2000	15,750	4,725	11,025	5,513	5,513	7,718	3,308
2010	18,750	4,688	14,063	7,031	7,031	12,656	1,406
2020	24,000	6,000	18,000	9,000	9,000	18,000	0

Remarks: 1) Share of trash fish of total landings: 50% (1990); 40 %(1995); 30% (2000); 25 %(2010 & 2020).
Source: Data of 1990 from DOF, Mersing

Origin/Destination of Fishery Products of East Johor (1990-2020)

Unit:MT

	For Domestic Consumption			Export	Total
	Local	Others	Sub-total	Singapore	
1990	9,901	9,563	19,464	19,464	38,927
1995	12,183	7,173	19,356	29,034	48,390
2000	13,897	11,366	25,263	37,894	63,157
2010	17,405	12,596	30,001	45,000	75,000
2020	21,889	14,111	36,000	54,000	90,000

Remarks: 1) Local refers to Mersing & Kota Tinggi districts.
2) Others refer to outside Mersing and Kota Tinggi districts and outside Johor State.
3) O/D based on production data of case 2.
4) Data exclude Rompin-Endau landings.

Source: Data 1990 from Annual Fisheries Statistics 1992, DOF

4. Future Plans

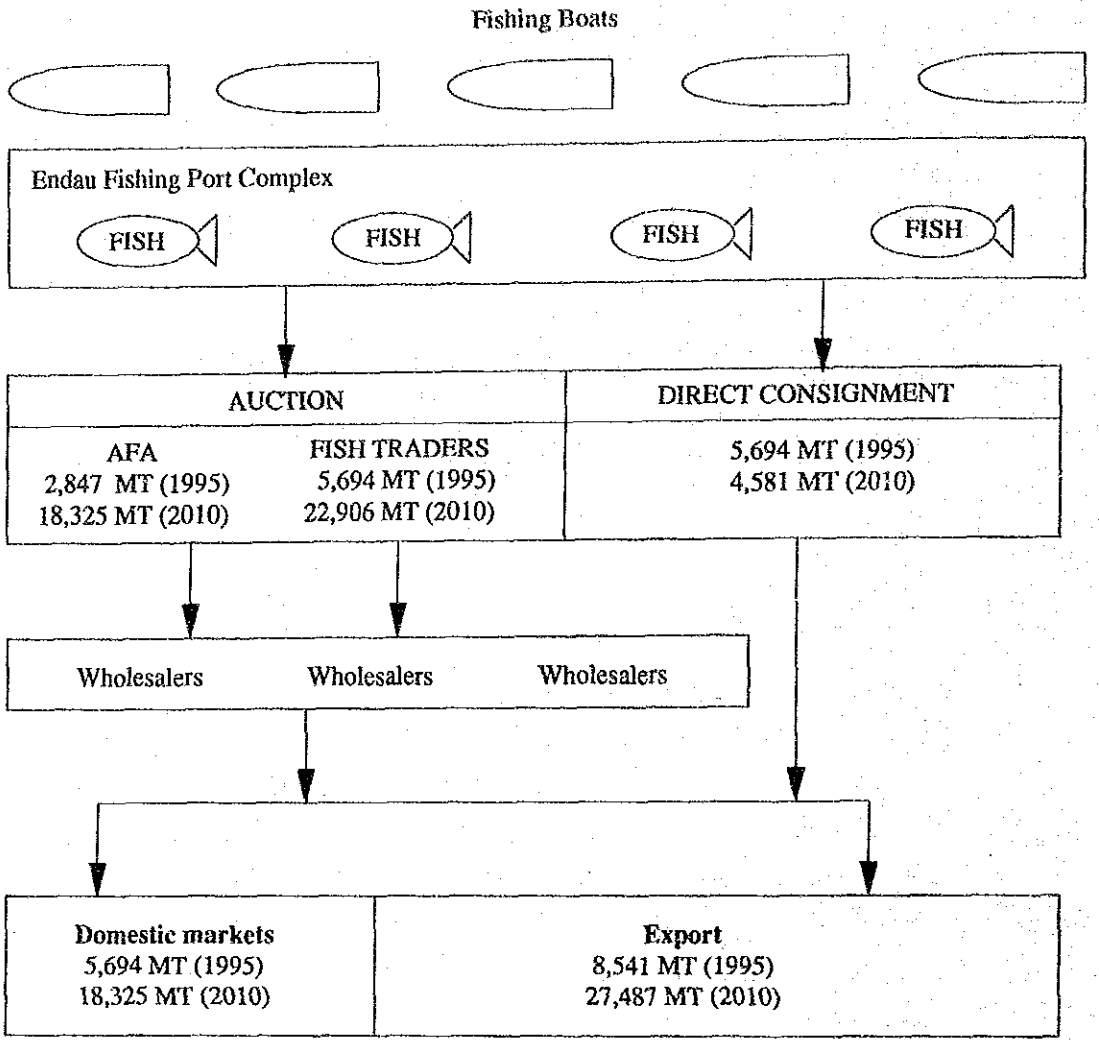
4.1 Fishery Resource Management Plan

A major factor underlying the decline in fish catch volume in recent years is over fishing of coastal fishery resources by trawling, etc. The probability that long-term over fishing of fishery resources will adversely affect the growth of the Malaysian fishing industry, is high. In order to implement various countermeasures of the ocean waters in the study area, it is essential that a detailed survey be immediately conducted and concrete policies on this issue be deliberated.

4.2 Plan on Improving the Fish Marketing System

(1) Fish auctions

From 1990 to the present, about 23 percent of the volume of fish landed at the LKIM complexes in east Johor, were handled by auctions. These auctions were implemented by the AFA or LKIM. In 1995, 60 percent of the total fish landing volume will be handled through auctions. One third of this volume will be handled by AFA and the remaining two-thirds by fish traders. By 2010, the ratio of fish sold through the auctions will increase further and 90 percent of the total fish landing volume of the new fishing port will be handled through the auctions. Of this ratio, 50 percent will be handled by fish traders, and 40 percent by the AFA. The remaining 10 percent will be earmarked for direct consignment.



Endau Fish Marketing System

(2) Plan on FMIS

Portable telephones will continue to be the means of communication used by fishing boats (class B, C, C2) during their fishing operations in the study area; and telephones will be generally used at the fish landing sites and the wholesale market. However, class A fishing boats will not use any communication device during their fishing operations since they are normally one day fishing trips.

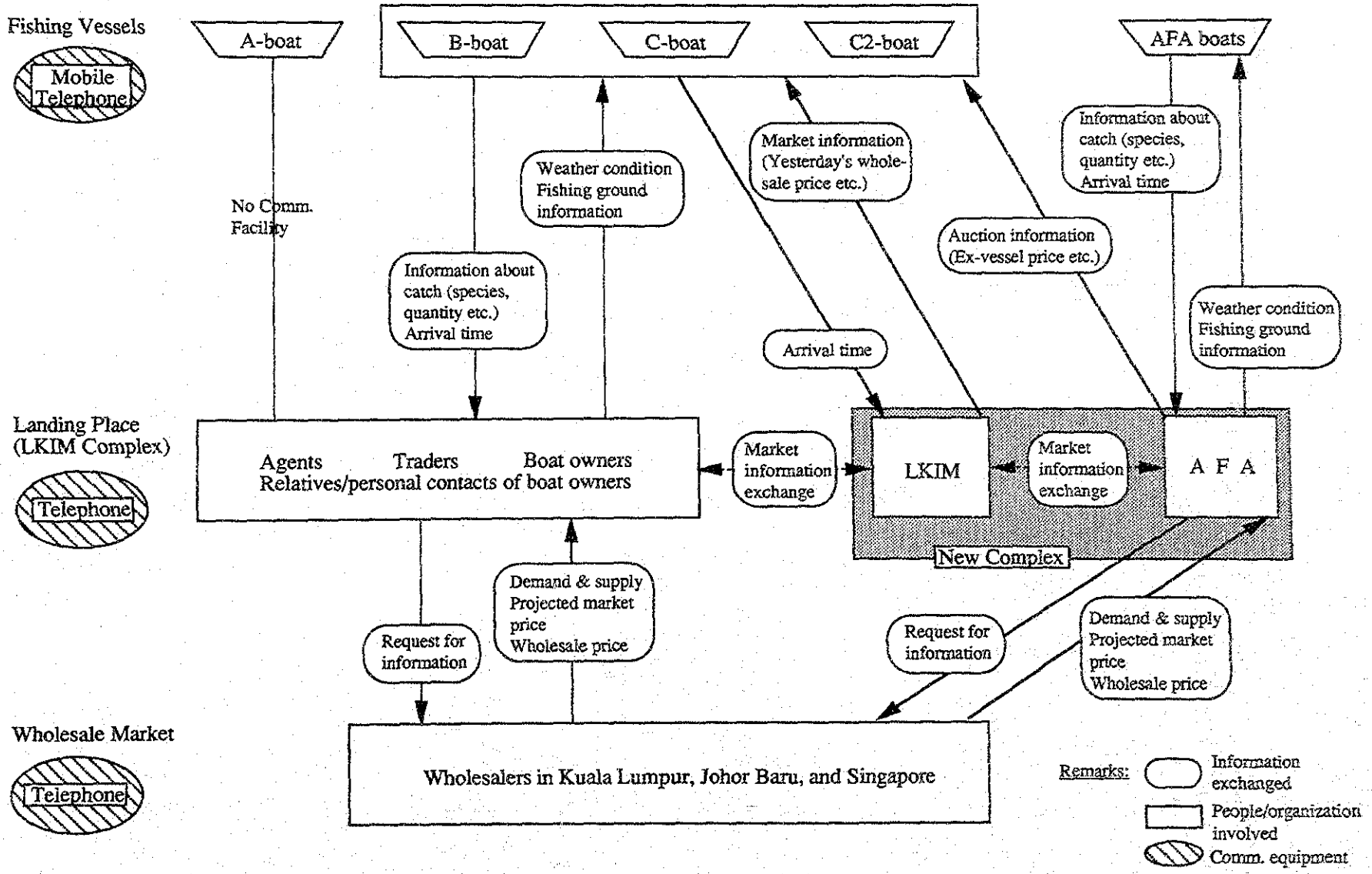
Establishing an open information network, as delineated below, will stimulate free competition in fish marketing within the study area.

1) Pilot project

Data on fish marketing obtained from fishing boat owners, fish traders, the AFA, etc. will be input and stored. This data base will be utilized in policy decisions of the complex, in future projections, etc. Information on the previous day's wholesale market conditions will be available upon request, to fishing boats out at sea, as a point of reference in their negotiations with the fish landing site or to fish traders, and the AFA, in their negotiations with the wholesale market.

2) AFA

The AFA will continue their role of fishing boat owner with the continuation of fishing operation using its own boats, and the role of fish distributor with their participation in fish auctions. Furthermore, an AFA staff member will be assigned to information management within the organization. He will be responsible for inputting and storing data on fishing operations of AFA boats and the auction (fish price, volume, etc.). In addition, he will be responsible for disseminating information concerning the auction of the previous day, to fishing boats at sea at their request.



FMIS Improvement Plan

4.3 Plan on Improvements in Organization and Institution

(1) Objective

The objective is to accelerate AFA participation in fish marketing and to strengthen its organization.

(2) Strategy

The strategy aims to revise a segment of the AFA Act and to upgrade the operational standard of each AFA activity. Under the newly organized administration of the AFA, support will be given initially by government bodies such as LKIM, BPM, etc., but in future it will be an independent private organization.

(3) Summary of plan

1) Revision of AFA membership qualifications

The AFA will be composed of members with the same economic interests. In order to formulate changes in member qualifications, a "Committee on Membership Qualification", composed of representatives from MOA, LKIM, NFA, SFA, AFA, and various fishermen representatives, will be established.

Optimum Option Plan on Membership Qualifications

a) Full member: All fishermen engaged in catching, harvesting or culture of aquatic organisms for a minimum of period of ninety days in a year, in category 11(1)A; only fishing boat owners receiving sixty percent or more of their total income from fishing industry, in category 11(1)C; fish processor, handler or dealer in category 11(1)B excluded; those engaged in research or in development and improvement of fishing industry shall be eligible for associate member}category 11(2) excluded

b) Associate-member: only fish processors in category 11(1)B, category 11(1)C excluded, all members in category 11(2)

c) Reforms: (i) Exclude all fish distributors/lessen the dominance of processors
(ii) Simplify economic strategy formulation by centering activities on members engaged in fishing operations
(iii) Secure cooperation of processors
(iv) Simplify AFA management

2) Establishment of a credit system

The existing BPM credit system for large development loans (for shipbuilding, etc.) will be expanded to include small operating loans (for fishing boat operations and repairs, etc. of boats and fishing equipment), which will be provided to members via the newly introduced AFA revolving fund system.

Financial sources for fishermen will be comprised of AFA capital and the BPM revolving fund. The shortage of capital for the pilot project will be partially offset by government subsidy. This subsidy will support only the initial inception period of the pilot project. It will furnish the operating capital for the first two months of the project.

The AFA will procure its own capital through a system of fish consignment contracts between the association and its members; and thereby, enable the association a guaranteed means of loan collection.

3) Strengthening and expansion economic activities

a) Strengthen fresh fish sales
b) Strengthen purchasing activities (diesel oil, ice)
c) Strengthen AFA fishing operations
d) Sport fishing
e) Pilot project on artificial reefs

4) Strengthening of comprehensive social activities

a) Initiate savings based social welfare activities
b) Initiate campaign to encourage members to save
c) Members' educational program: Foster a spirit of cooperation
d) Offer supervision of members' fishing activities

5) Strengthening of administrative ability

There is a need to train the manager and middle management staff members in administrative ability; and the existing LKIM educational facilities should be used. An effective curriculum appropriate for an AFA manager training program should be developed.

6) Reformation of AFA organization

The highest decision making body within the AFA is the general assembly. The Board of Directors will be empowered by the general assembly; and there will be a manager and assistant manager under the Board of Directors. The administration will be composed of the Management/Administrative Division, Credit Activities Division, Economic Activities Division, and Social/Welfare Activities Division. The total number of administrative personnel will be 39 members who will be responsible for AFA activities. Of this number, six members will be based at the branch office in Penyabong to oversee services for class A fishing boats.

a) Manager

In view of the present educational level of the fishermen, recruiting an individual appropriate for the position of Manager from their ranks, is difficult. Therefore, the Manager will be recruited from the private sector or sent from LKIM. The Manager will not be a member of the Board of Directors but he will attend the meetings of the board and he will be empowered by the board to manage the association. He will be entrusted with the responsibility to oversee all AFA activities and the right to carry out all activities decided by the board.

b) Assistant manager

The Assistant Manager will not be a member of the Board of Directors and he will carry out the duties of the Manager in his absence. He will be responsible for assisting AFA operations under the direction of the Manager, in addition to carrying out coordination work on the east Johor Fishing Port Complex.

c) The AFA administration will consist of a management division, an economic affairs division (purchase of oil, water, and ice, fish sales, fishing operations), a social activities division, a credit activities division, and a branch office in Penyabong.

7) Long-term strategy

Under the supervision of the DOF, the AFA will be commissioned exclusive fishing rights in a specified ocean area. In exchange for these exclusive fishing rights, it will be responsible for the management and the use of fishing grounds, as well as for measures propagating fishery resources.

4.4 Plan on Fishing Port and Its Related Facilities

(1) Characteristics of fishing port

The study area has developed into one of the largest fishing bases in Malaysia. It is an integrated fish marketing and processing base which handles mainly fish for exportation with the objective of earning foreign currency.

The Endau fishing port will become the nucleus of the study area and the adjoining Penyabong will become its satellite center of operations. The LKIM complexes at Mersing and Kuala Sedili will function as a sub center. Port operations will function more efficiently

by separating small and large fishing boats according to fishing port. Under this plan, the new fishing port facilities will encompass only Endau, the center of the fishing base.

The characteristics of the new Endau fishing port are given below.

1) The fishing port will mainly accommodate large class C, C2 fishing boats of 40 tons or more.

2) The port will be a modern fish processing and export base.

3) The fishing port will be the focus of a pilot project instituting reforms in the fish marketing system of Malaysia.

(2) Selection of optimum site

Two alternative sites along the Endau River were candidates for the new fishing port. In a comparative study of the two sites, it was concluded that site 2, located downstream from the road bridge across the river, was more appropriate for the new port facilities than site 1, the existing LKIM complex.

(3) Projected fish landing volume of new Endau fishing port

Unit: MT

Year	Food Fish	Landing at	
		LKIM	Private Jetty
1990	15,500	1,150	14,350
1995	28,471	14,235	14,236
2010	50,903	45,812	5,091

Remarks: 1995/2010 data includes Endau/Rompin landings.
Source: Data of 1990 from DOF, Mersing

(4) Projected number of fishing boats at new Endau fishing port

Unit: Boats

Year	Class-A	Class-B	Class-C	Class-C2	Total
1990	29	62	88	39	218
1995	15	55	70	89	229
2010	0	20	95	130	245

Remarks: 1995/2010 data includes boats of Endau/Rompin.
Source: Data of 1990 from DOF, Mersing

(5) Content and scope of facilities

1) Basic facilities

The new fishing port planned at Endau is located along the river near the river mouth. As such, the natural conditions of the land, river, and sea need to be considered in the design. The objective of the port plan is to skillfully exploit this unique situation, by limiting the man-made facilities to a minimum and destroying as little as possible, of the existing balance in natural conditions. Measures to protect these unique features were taken into consideration.

Required Berth Length

Unit: meters

	Class-A & B	Class-C & C2	Total
Unloading	23.9	196.7	220.6
Preparation	23.9	112.4	136.3
Mooring	95.6	1152.1	1247.7

2) Land

The total area required for the planned site is approximately 7.7 hectares, of which 1.4 hectares (about 18 percent) have already been acquired by LKIM. Although the port compound includes the road owned by JKR and the earth drain owned by JPS, much of the required land is privately owned. In addition to the 7.7 hectares of required land, approximately 0.29 hectares must be readied in exchange for the aforementioned earth drain owned by JPS.

The planned construction site runs into a segment of the JPS earth drain. As a result, both the earth drain and the road must be moved outside the premises of the construction site.

3) Functional facilities

a) Market hall

The market hall will be used for handling food fish.

b) Office

There will be two offices at the port. One is the main administration office which will be located within the complex, and the other is the office overseeing actual operations. It will be located on the second floor of the market hall.

c) Ice production

An ice plant capable of producing 50 tons of ice per day will be built.

d) Ice storage

Four small ice storage facilities will be dispersed throughout the market hall. Ice will be transported by small trucks from the new ice plant.

e) Cold storage

Due to the considerable length of the fish landing jetty, four cold storage facilities will be located throughout the market hall for convenient loading/unloading of fish.

f) Freezing plant

The two species of fishery products that will be processed by the freezing plant are cuttlefish and round scad. Locally landed fish and fish exported to Thailand for processing from Kuantan (Pahang state) will be processed and frozen in Endau.

Round scad will be processed and frozen, in order to prevent the fish price from falling during the five months of the peak fishing season.

g) Surimi processing plant

Thread fin bream is the major fish species used in surimi production. Presently the head of the fish is removed and the body is exported to Singapore for processing. In future the processing will be done locally before exportation. In addition, fish from Kuantan which is head cut and exported to Thailand for processing will also be processed locally. The surimi will be sent to Penang for second stage processing or exported.

h) Dried/salted fish plant

The dried fish processing plant will be capable of producing high quality dried fish through use of a low heat drying unit. However, the scope of this plant will only be capable of developing new products on a trial basis.

j) Fish meal plant

Construction of a new fish meal plant is not planned. The two fish meal plants currently in operation at the proposed port construction site will be relocated as soon as possible.

j) Shipyard

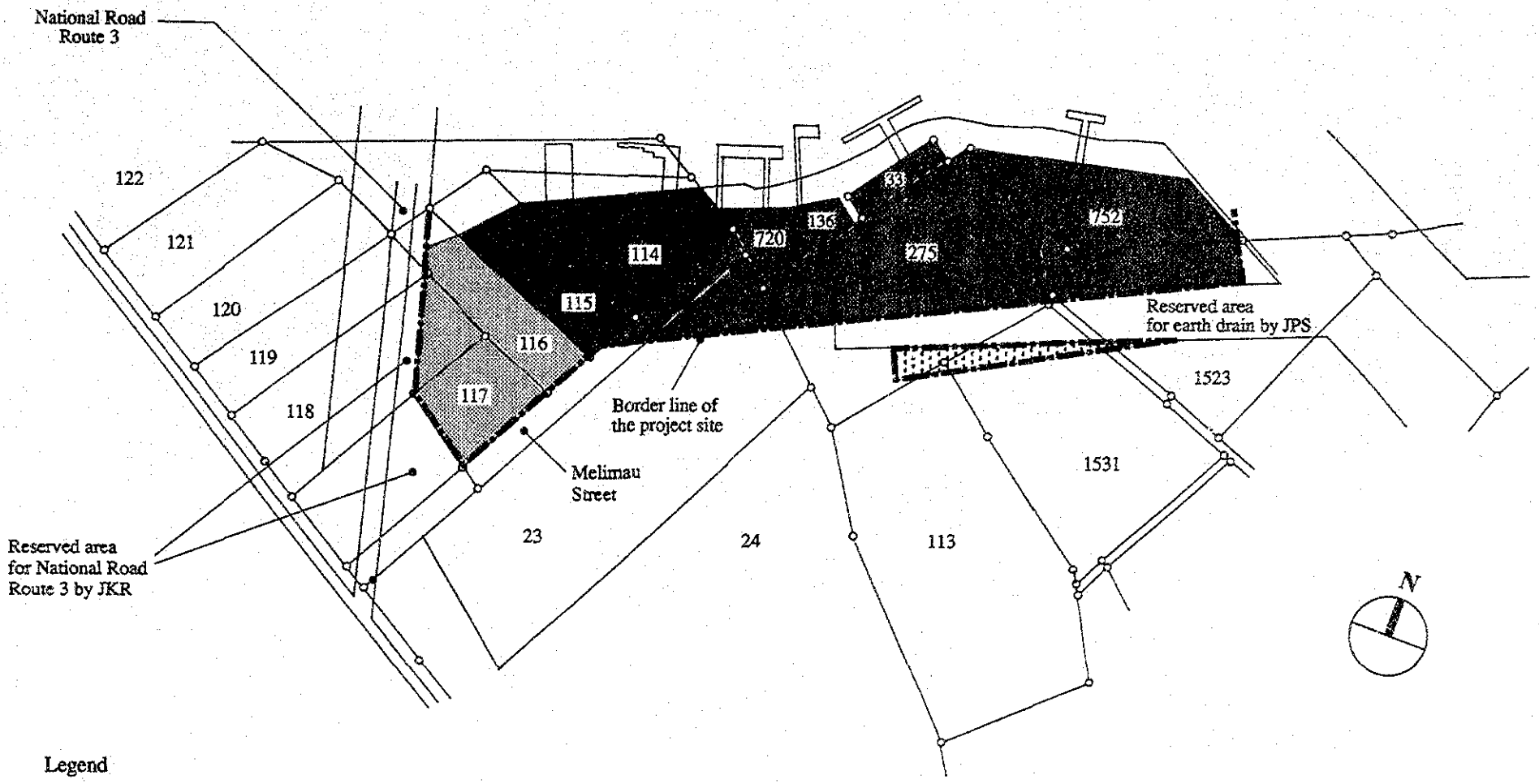
The shipyard will construct new fishing boats, in addition to repairing boats. The yard will have repair facilities for engine and electrical instruments as well as boat construction.

k) Fuel oil supply facilities

Fuel oil will be supplied to fishing boats using the LKIM complex. The fueling pump will be a large capacity pump.

l) Stockpiling area for fish boxes, fishing gear repair/storage area

m) Electric power station, water reservoir and waste water treatment facilities



Legend

: Land already acquired by LKIM

: Area in the process of acquisition by LKIM

: Additional area required to be acquired by LKIM for the project

: Area to be acquired for the relocation of DID drain

Source : Pejabat Tanah Daerah (Land Office) Mersing, 26 Sept. 1992

Land Requirement for Endau Fishing Port	S=1/5,000	Endau Fishing Port Complex	GOVERNMENT OF MALAYSIA THE FEASIBILITY STUDY ON THE PILOT PROJECT FOR IMPROVEMENT OF FISH MARKETING AND DISTRIBUTION SYSTEM IN MALAYSIA JAPAN INTERNATIONAL COOPERATION AGENCY

(6) Facility layout plan

The port facilities will be placed in three different zones according to their function, maintenance, and operation methods.

1) Zone 1

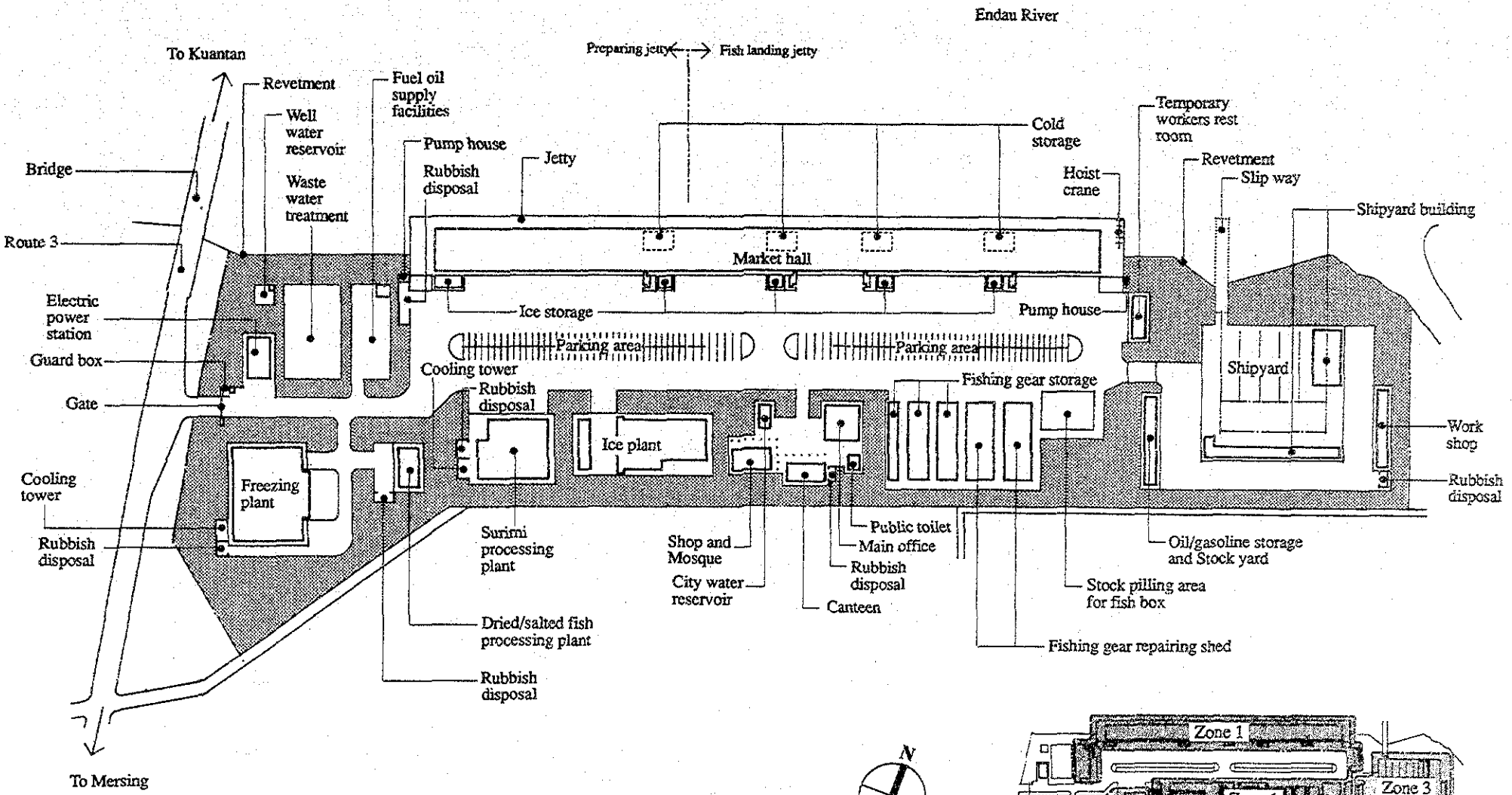
A large open area containing a parking area for trucks and vehicles and the access road was placed in the center of the port compound. Fish landing and marketing facilities as well as other facilities related to fishing activities were concentrated here facing the open area.

2) Zone 2

Fish processing facilities are located in Zone 2 at the west end of the port compound, in order to facilitate transport activities.

3) Zone 3

The shipyard containing boat repair and construction facilities is located in Zone 3 at the east end of the port compound.



Zoning of the Port Facilities

Layout Plan	Endau Fishing Port Complex	GOVERNMENT OF MALAYSIA THE FEASIBILITY STUDY ON THE PILOT PROJECT FOR IMPROVEMENT OF FISH MARKETING AND DISTRIBUTION SYSTEM IN MALAYSIA JAPAN INTERNATIONAL COOPERATION AGENCY

4.5 The Project Cost Estimation

Factors such as imported construction material cost, duty free products, foreign exchange rate, price escalation, building cost index, consumer price index, and the unit cost index provided by JKR were taken into consideration in calculating the Project cost.

Item	CIVIL/BUILDING COST			PLANT/EQUIPMENT COST			Total (RM)
	Local Portion (RM)	Foreign Portion (RM)	Sub-Total (RM)	Local Portion (RM)	Foreign Portion (RM)	Sub-Total (RM)	
BASIC FACILITIES							
1 Jetty	6,321,041	1,100,000	7,421,041	0	0	0	7,421,041
2 Mooring Facilities	506,550	0	506,550	0	0	0	506,550
3 Revetment and shore protection	2,510,600	1,300,000	3,810,600	0	0	0	3,810,600
4 Navigation sys. & survey	100,000	0	100,000	75,000	325,000	400,000	500,000
Subtotal of Basic Facilities	9,438,191	2,400,000	11,838,191	75,000	325,000	400,000	12,238,191
FUNCTIONAL FACILITIES							
5 Marketing Hall/Cold Storage	4,618,893	0	4,618,893	687,000	1,319,000	2,006,000	6,624,893
Ice Plant	1,291,276	0	1,291,276	1,200,000	460,000	1,660,000	2,951,276
7 Surimi Plant	1,152,037	0	1,152,037	723,000	2,022,000	2,745,000	3,897,037
8 Office	803,925	0	803,925	0	150,000	150,000	953,925
9 Freezing Plant	2,121,093	0	2,121,093	769,000	920,000	1,689,000	3,810,093
10 Dry Fish Plant	236,690	0	236,690	72,000	147,000	219,000	455,690
11 Shipyard Building,Stockyard,Slipw	2,052,945	0	2,052,945	1,034,000	92,000	1,126,000	3,178,945
12 Workshop	235,485	0	235,485	240,000	315,000	555,000	790,485
13 Fish Gear Storage	512,150	0	512,150	0	0	0	512,150
14 Shop & Mosque	318,975	0	318,975	0	0	0	318,975
15 Electric Power station	307,926	0	307,926	1,183,500	0	1,183,500	1,491,426
16 City Water Reservoir	119,835	0	119,835	0	0	0	119,835
17 Fish Gear Repairing Area	629,030	0	629,030	0	0	0	629,030
18 Waste Treatment Plant	704,770	0	704,770	0	1,300,000	1,300,000	2,004,770
19 Infrastructure	4,428,340	0	4,428,340	0	0	0	4,428,340
20 Fuel Supply Pumphouse	63,000	0	63,000	70,000	97,000	167,000	230,000
21 Other Facilities	1,276,242	0	1,276,242	0	0	0	1,276,242
22 Furniture	0	0	0	505,000	0	505,000	505,000
Subtotal of Funct.facilities	20,872,613	0	20,872,613	6,483,500	6,822,000	13,305,500	34,178,113
PRELIMS & OTHER COSTS							
23 Preliminaries	4,200,000	0	4,200,000	0	0	0	4,200,000
24 Site Clearing/Reclamation	1,200,000	0	1,200,000	0	0	0	1,200,000
25 Relocation of DID Drain	172,500	0	172,500	0	0	0	172,500
26 Dredging	307,200	0	307,200	0	0	0	307,200
27 Land Acquisition	734,058	0	734,058	0	0	0	734,058
28 Consultancy Fee	2,216,840	2,216,840	4,433,680	0	0	0	4,433,680
29 Contingencies	5,750,000	0	5,750,000	0	0	0	5,750,000
Subtotal of Prelims & Other Costs	14,580,598	2,216,840	16,797,438	0	0	0	16,797,438
Total Project Cost	44,891,400	4,616,840	49,508,240	6,558,500	7,147,000	13,705,500	63,213,740

Remarks:

1 Building cost includes electrical, plumbing, fire fighting and sewage services of the building.
2 Plant/Equipment cost includes supply & installation of the equipment.
3 The foreign portion of Item 1 comprises bollards, bitts, mooring rings and fenders.
4 The foreign portion of Item 3 comprises steel sheet piles.
5 The foreign portion of Item 4 comprises navigation buoys and light beacons.
6 The foreign portion of Item 5 comprises cold & ice storage plant, ice crusher, forklifts, and hoist cranes.
7 The foreign portion of Item 8 comprises 3 nos. Pajeros
8 Item 19: Infrastructure includes ext.works(eg. road, lawn, geen.drainage,fencing)and common services (eg.elect,water,tel.com lines,str.light
9 Item 21: Other facilities, includes ice storage, public toilet, guard box, incinerator/rubbish area, temp.workers rest room, canteen and their associated M & E.
10 Item 22: Furniture includes basic furniture for all the facilities.
11 Item 23: Preliminaries include site establishment&setting out,temporary facilities,site management,demolition/disposal of existing, structure,contractor's personnel&plant mobilisation,performance bond/insurance and other necessary prelim.expenses for constr. activities.
12 Consultancy fee has been split 50:50 between Local & Foreign Portion to allow foreign consultant participation in J.V with local consultant It has been estimated at 8% of total constr. cost (excl. land acq.)+RM250,000 for Soil Investigation for detail design stage.

4.6 Project Management Plan

(1) Basic policy

1) Efficiency and impartiality

The project aim is not only to ensure economic efficiency in the management and operation of the facilities, but it is also highly concerned with promoting income redistribution for fishermen at all levels. Subsequently, benefits for fishermen are the foremost issues pervading all aspects of the Project.

2) Privatization

In the initial stages, port management will be directly supervised by the government, but in future it will be turned over to the private sector. Therefore, a policy aimed at turning over the facilities to private supervision in stages will be instituted (projected to be achieved within five years from the start of port operations).

3) Institution of integrated management

The entire Project will be integrated into one general organization. Those facilities which can be placed under private management from the start of operations, will be completely turned over or leased to the private sector. Under this system, the AFA will be regarded as one of the private organizations; and it will be involved in the management and operations.

(2) General organization

"The Fishing Port Complex of East Johor", henceforth referred to as the fishing port complex, will be placed under the jurisdiction and management of the LKIM for the time being. In future, the port complex will become a private corporation. In order to manage the port complex, a staff of 24 members will be employed.

(3) Board of directors

1) Membership

The board of directors will be composed of representatives from MOA, DOF, LKIM, BPM, NFA, SFA, state representatives, representatives from the state office of DOF, FDA, LKIM, BPM, representative of fishing boat owners, fishing crew members, fish traders and processors.

2) Function

The functions which will be carried out by each of the aforementioned groups are as follows:

a) MOA: Provide assistance on administrative and budgetary measures, and legal revisions.

b) DOF: Issue fishing licenses, manage fishery resources, provide information on fishing.

c) LKIM: Provide assistance on legal revisions, issue licenses to fish traders, operate fishing port facilities and equipment, provide information on fish marketing, provide port staff personnel, provide educational and technical guidance, provide financial assistance to the AFA, and implement measures for the gradual withdrawal of existing private jetties.

d) BPM: Finance AFA revolving funds and provide collection services, provide staff for credit management.

e) NFA/SFA : Support AFA economic activities by providing diesel oil, ice, etc. to the AFA.

f) State government representatives: Responsible for securing the land site of the fishing port complex, accelerate investments in fish processing plant, etc., and supervise removal of private jetties.

g) DOF state branch office: Monitor fishery resources in study area waters and provide information to DOF headquarters

h) LKIM Branch Office: Execute duties stipulated by LKIM headquarters

i) BPM Branch Office: Supervise AFA credit system and execute duties as stipulated by BPM headquarters

j) Fishing boat owners: Adjust the advantages and disadvantages found within each class of boat, A, B, C, C2

k) Fishing crew members: Revise income distribution system according to the panggu system

l) Fish distributors: Represent the interests of this group

m) Fish processors: Represent the interests of this group

(4) Advisory committee

The advisory committee will provide advice to the fishing port complex manager. The committee will be composed of experienced personnel in the areas of fishing port management and the fish marketing system, etc.

(5) Organization and function

1) Manager

Responsible for the general administration of the entire fishing port complex.

2) Assistant manager

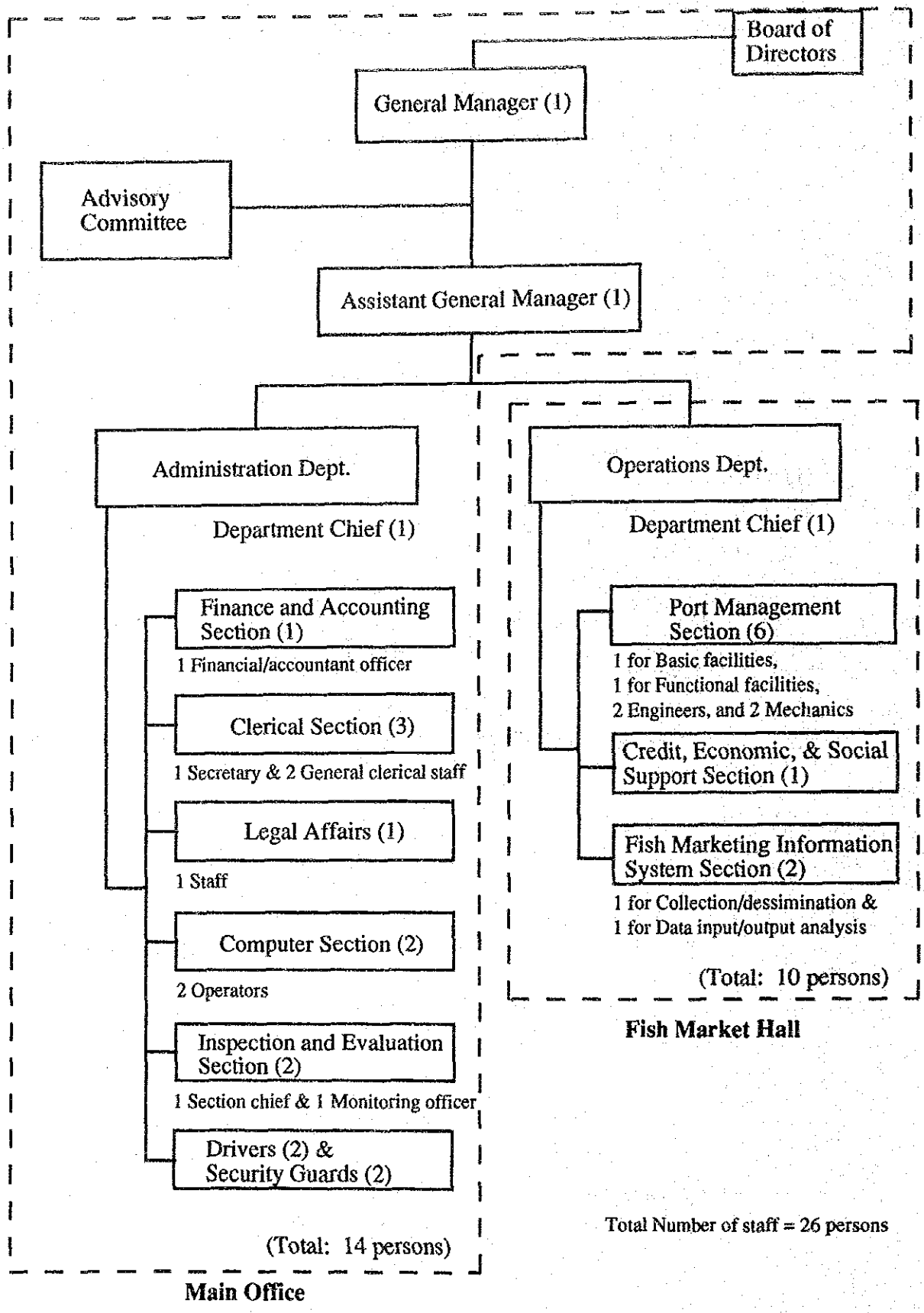
Responsible for carrying out the general administrative duties as stipulated by the general manager and to carry out the duties of the manager in his absence

3) Administration department

This department will be composed of a financial/accountant officer, clerical staff, legal advisor, computer controller, inspection and evaluation officer, drivers and security guards.

4) Operations department

The operations department will be responsible for fishing port operations (basic facilities, and the maintenance and control of all functional facilities), supporting AFA operations, and managing the fish marketing information system.



Operational Organization of the Complex

5. Project Evaluation

Based on the project plan to improve basic and functional facilities and to strengthen its organizational system, the Project's economic and financial aspects, as well as benefits such as land utilization, area development, etc. evolving from the Project, were comprehensively evaluated.

5.1 Economic Evaluation

The economic evaluation was based on an analysis of project cost, opportunity costs, and value added stemming from fish processing plants, etc. The economic internal rate of return (EIRR) in the evaluation, was estimated as follows.

The EIRR of the project was estimated at 12.05 percent; and the interest rate on long-term bank loans in Malaysia is 6.5 percent. Subsequently the EIRR is high; and constructing the facilities is possible and contributory to national economic growth.

By 1995 saving of opportunity costs will comprise approximately 80 percent of the economic benefits. This indicates the significance of the benefits accorded to fishermen and wholesalers (50 % for fishermen and 30 % for wholesalers) are great. The remaining 20 percent is for fish processors through value added in processing.

Based on the above, it has been evaluated that the Project is viable from economic viewpoint.

5.2 Financial Evaluation

(1) Evaluation of planning on organization and institution

An evaluation of the proposed credit system for the AFA and its main activities was made, in order to determine the financial viability of the plan. The findings are presented below.

1) AFA revenue stemming from loan collection and operation of revolving fund

The AFA revolving fund will be based solely on BPM capital, as subsidies from LKIM are minimal. If the loan source is SPKP, the BPM interest rate is two to six percent, excluding commissions.

According to the findings of a viability analysis, 50 percent of the beneficiary fishing boats who fall into case 6 (at 8% interest rate to fishermen) will be able to repay the loan. Subsequently, AFA will also make a profit. In order to offset the BPM interest rate of four percent (two percent interest and two percent commission), AFA will be required to charge seven to eight percent interest rate on loans to fishermen, that includes a four percent interest the association must collect for credit operations.

2) Financial evaluation of AFA activities

Financial evaluation on the activities of the Endau AFA was based on the income statement. The main source of revenue for the Endau AFA stems from the sale of diesel oil and ice, fish auctions, and fishing operations. According to the association's income statement and cash flow, it is anticipated that their net profit will be RM513,674 in 1996 and RM1,262,256 in 2011. If expenditures on social activities rise, there should be no difficulties in raising funds.

(2) Financial evaluation of pilot project

A financial evaluation of the pilot project was made using the income statement and cash flow. The financial internal rate of return (FIRR) is 7.38 percent in case of full construction, and 8.45 percent with phase construction. However, this value is based on the premise that 50 percent of basic facility construction costs would be offset by government equity.

5.3 Other Benefits

Other benefits evolving from the project are the effects of hinterland development and efficient land use after demolition of private jetties.

5.4 Preliminary Environmental Assessment

A preliminary environmental assessment survey was carried out, in accordance with the Environmental Impact Assessment Guidelines of the Department of Environment of Malaysia. Furthermore, a detailed environmental assessment study must be carried out before the project is implemented.

(1) Construction period

1) Natural environmental impact

A bucket dredger will be used to dredge the river bottom during the construction phase, to contain the degree and range of contamination to a minimum. An appropriate area will be selected to dispose the dredged sediment.

2) Socio-economic Environmental Assessment

a) Relief measures to assist private jetties

Relief measures will be implemented for two private jetties which will be unable to land fish during construction of the new fishing port, by allowing them to use the jetties at the existing LKIM complex.

b) Relocating the fish meal plants

Trash fish used by the two fish meal plants will be permitted to land at the existing LKIM complex. During the port construction period, the government will be required to prepare an alternate location for both plants as part of its relief measures and to complete the negotiations on reparations.

c) Navigational barriers of the river

The river can be easily crossed by passengers/cargo by an overland bridge. The number of fishing boats entering and exiting the river mouth per unit/time is minimal and pose no problems. The tourist ferry boats' use of their jetty on the opposite riverbank will not be disrupted by port construction, as only a narrow area of water will be affected during the port construction.

(2) Operational period

1) Natural environmental impact

a) Effect on ecosystem

The construction site of the new fishing port includes an area of mangroves. However, since the area is small, their removal is not expected to negatively affect the ecosystem of the area. Furthermore, the dimensions of the area are well within the limitations established by the Environmental Protection Act of Malaysia on large scale development projects which require environmental assessment.

b) Sand and soil accumulation at the river mouth

The level of sand and soil accumulation at the river mouth pose no major problems. However, if other new developments occur along the river, it may be possible for added sand and soil to flow downstream and accumulate at the river mouth. Therefore, it will be necessary to carefully consider any development along the river.

c) Changes in river flow conditions

The jetty will be a pier type structure rather than a massive gravity type structure. The dimensions of the jetty projecting into the river will be kept to a minimum, in order to lessen its effect on the river flow.

The landfill behind the jetty will be extended about 30 meters from the existing revetment into the river when the new fishing port is constructed. The area which will be reclaimed from the river, was once dry land which disappeared through erosion. The new reclaimed boundary will be closer to the original beach line; and it has been concluded that negative effects on river flow conditions would be minimal.

d) Countermeasures on waste and sewage water

Waste disposal, mainly waste produced during fish processing, will be carried out by government waste collection services. In addition, a waste water treatment facility which meets the standards established by the Department of Environment will be built within the new fishing port complex.

2) Socio-economic impact

a) Historical and cultural impact

The Project site and the surrounding areas do not contain any historical or archaeological artifacts or ruins.

Endau has historically been a major agricultural and fishing area, and therefore, implementation of this Project is not anticipated to negatively affect the historical and cultural elements of the area.

b) Relocation relief measures

(i) Fish meal plants

After their relocation has been completed, the two fish meal plants will be allowed to freely use the landing facilities at the new fishing port until the facilities have become fully engaged. However, if the plants wish to continue using the fishing port, the fish landing hours for food fish or the supply jetty operating hours can be adjusted to allow trash fish to be landed. Another option would be to construct a jetty in front of the newly relocated plant. This decision will be made by the owners of the fish meal plants in consultation with the government.

(ii) Relocation of relevant fishermen families and increase in fishermen population

The class C2 fishing boats owners and fishermen who rent both land and house, will be required to relocate from Mersing to Endau. They will be granted relief assistance.

In addition, when the Pilot Project is fully underway, the increase in the fishermen population will be included in the housing provisions.

However, the overall growing trend within the nation is a decline in fishermen; and subsequently, it is anticipated that there will be a rise in the number of foreign fishermen. The aforementioned housing provisions will not apply to this group of fishermen. Generally, such fishermen often stay aboard their fishing boats.

Based on the aforementioned factors, it has been concluded that the housing provisions plan should be prepared to accommodate roughly 150 households.

c) Traffic congestion on the access road

There is no significant traffic congestion on the access road.

d) Collision risk between tourist ferry boats and fishing boats at river mouth

Currently in Mersing both fishing boats and tourist ferry boats enter and exit through the river mouth. Due to its extremely shallow depths and narrow river mouth, all boats are only able to enter and exit this area during high tide. Despite the fact that there is a large number of ferry boats, no collisions have been reported at the river mouth to date.

It has been concluded that the risk of future collisions between fishing boats and ferry boats is nonexistent, judging from the width of the Endau river mouth.

e) Survey on Women in Development (WID)

The number of children in fishermen families most commonly ranged from five to three. Television sets were widespread and fishermen wives' knowledge of public health and education was acquired solely from television programs.

The jobs held by the wives of the fishing village in the areas surrounding the project site are described below.

(i) Head cutting at the jetty or at the fish cracker plant
(ii) Operating a small retail shop or coffee shop
(iii) Operating a fish cracker plant
(iv) Employee of rubber plantations
(v) Employee of fish processing plant
(vi) Operation of small home farm

In view of the fact that over half of the housewives expressed their desire for employment opportunities near their homes, the new fishing port is anticipated to become a source of employment. With an increase in working housewives, family incomes will increase, along with a rise in education and public health care standards.

f) Creation of employment opportunities

In addition to employment opportunities generated by new fishing port operations and the reorganization of AFA, employment opportunities will be created by new businesses that are anticipated to evolve in the surrounding area.

6. Conclusions and Recommendations

(1) Reforms in fish marketing system

The organizational and institutional reforms in the fish marketing system, including improvements to the fishing port and its related facilities, will shift the center of fishing activity from the existing private jetties to the new fishing port located in Endau; and subsequently, fish landings in the area will be concentrated in this one location. As a result, rationalization of the fish marketing system will progress, in conjunction with a rise in fishermen incomes due to a fish marketing system led by fishermen.

(2) Reforms in the FMIS

The existing FMIS in the private sector will be adapted to include fishermen and the AFA, which will help establish the principles of free competition. The public information system currently in progress as a national network will only fulfill a supporting role in the pilot project.

(3) Organizational and institutional reforms

Organizational and institutional reforms will include revising AFA member qualifications, improving its credit system, and strengthening its activities by establishing a committee on organizational and institutional reforms, which will include representatives of government and fishermen of all classes. Although during the initial few years of pilot project implementation, LKIM and other government bodies will be required to provide support in the area of human resources and fund, ultimately the project will be run independently by fishermen. Formulating the transitional process from the public to private sector is the responsibility of the aforementioned committee on organizational and institutional reforms.

(4) Improvements to the fishing port and fish marketing system

1) State government countermeasures on such issues as land acquisition for construction purposes, removal of private jetties, relocation of fish meal plants, relocation of fishermen houses, management of undeveloped land after construction, etc. are required.

2) Measures to restrict development along the river are required because there is a possibility of downstream flow and sedimentation of mud and sand at the river mouth.

(5) Funding for construction costs

In view of the benefits to fishermen, government subsidy will be required as well as low interest loans and private owned equity to cover 50 percent of the basic facility cost.

(6) Management of the pilot project

In its initial stages the pilot project will be directly managed by the government or statutory/subsidiary bodies. However, operations will be turned over to the private sector as early as possible after operations have commenced. In order to achieve a unified system of operations, the entire Project will be organized into one general administration. Each facility will be transferred to private operation or leased. The AFA will be considered as one of the

private organizations involved in project operations. A committee on operations will be established to formulate policies on organizational operations. Committee members will be composed of representatives from MOA, DOF, LKIM, BPM, NFA, SFA, state government representatives, state branch offices (DOF, FDA, LKIM, BPM), representatives of fishing boat owners, fishing crew members, fish traders, and fish processors.

(7) Technology transfer

Until Pilot Project operations get off the ground, it will be necessary to invite foreign experts to train future core members responsible for project administration and operations or to send these members for training abroad. Technology transfer will be required for the overall fish marketing system including fishing port management, and fishermen associations. Technology transfer from abroad does not signify simply technical knowledge, but the transfer of knowledge in terms of organization and institution. Therefore, it will be necessary to provide support in this area in the form of a comprehensive package. Details of package shall be considered during the implementation stage.

The Pilot Project will not only serve as a model for reform implementation of the domestic fish marketing system of Malaysia, but has the potential to evolve into a future international base for technology transfer.

(8) Reforms on fishery resource management

This Project study is concerned with reforms to improve the fish marketing system and it does not include a study on improving the environment for fish production. However, in recent years the growth of trawling within the fishing industry has strongly affected fish production volume to declining levels, in addition to a conspicuous drop in fishing efficiency. In order to further enhance improvements in the fish marketing system proposed in this study, instituting reforms in the resource management system for coastal fisheries is an urgent issue. In view of current conditions, it is recommended that a study on comprehensive use of coastal waters be implemented in the ocean waters off East Johor.

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III. PLANNING

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ABBREVIATIONS

ADB	:	Asian Development Baank
AFA	:	Area Fishermen's Association (PNK)
AJDF	:	Asean Japan Development Fund
BPM	:	Bank Pertanian Malaysia
CIDA	:	Canadian International Development Agency
DF/R	:	Draft Final Report
DID	:	Department of Irrigation and Drainage
DOE	:	Department of Environment
DOF	:	Department of Fishery
DOS	:	Department of Statistics
EEZ	:	Exclusive Economic Zone
EPU	:	Economic Planning Unit
FA	:	Fishermen's Associations
FAMA	:	Federal Agricultural Marketing Authority
FAO	:	Food and Agriculture Organization (United Nations)
FMDS	:	Fish Marketing and Distribution System
FMIS	:	Fish Marketing Information System
FMR	:	Fish Marketing Regulations
F/R	:	Final Report
GDP	:	Gross Domestic Product
GOM	:	Government of Malaysia
GPS	:	Global Positioning System
IC/R	:	Inception Report
IT/R	:	Interim Report
JKR	:	Public Works Department
LKIM	:	Fisheries Development Authority of Malaysia
MOA	:	Ministry of Agriculture
MOF	:	Ministry of Finance
M/P	:	Master Plan
NAP	:	National Agricultural Policy
NDP	:	National Development Policy
NEP	:	National Economic Policy
NFA	:	National Fishermen's Association (NEKMAT)
O/D	:	Origin and Destination
OPP2	:	Second Outline Perspective Plan
PPD	:	Primary Product Department (Singapore)
P/R	:	Progress Report
RM	:	Ringgit Malaysia
S/D	:	Supply/Demand
SEPU	:	State Economic Planning Unit
SFA	:	State Fishermen's Association
SPKP	:	Special Integrated Agriculture Loan Programme
WID	:	Women in Development

I. INTRODUCTION

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1. Background

The Government of Malaysia formally requested a study on improving the existing fish marketing and distribution system in order to raise fishermen income. In compliance with this request, JICA implemented a nationwide development study entitled "The Study on Fish Marketing and Distribution System in Malaysia" from November 1989 to March 1991.

Based on this study, it was proposed that governmental bodies responsible for fish distribution operations become locally self-autonomous or turned over to the private sector as part of the effort to restructure the fish distribution center on the east coast of the peninsular Malaysia and to strengthen the economic and credit functions of the AFA. As a first step toward instituting these improvements, east Johor was selected to be the center of a pilot project where such improvements could be carried out.

In response to a request by the Government of Malaysia for the F/S study concerned with the implementation of the pilot project, JICA conducted a preliminary survey in December 1991, and both the governments of Malaysia and Japan reached an agreement on "S/W for the Feasibility Study on the Pilot Project for Improvement of Fish Marketing and Distribution System in Malaysia". On the basis of the agreement records, JICA dispatched this study team to carry out the feasibility study.

2. General Outline of the Study

(1) The Objective of the study

The objective of the study is to conduct a feasibility study on implementation of a pilot project incorporating institutional reforms and a physical plan of facilities in east Johor as a model case to improve the existing fish marketing and distribution system in Malaysia.

(2) The study area

The study area shall cover the eastern part of Johor State

(3) Study approach

The study was conducted in two phases. The most appropriate model site in east Johor was selected and its basic structure was substantiated (as the regional M/P) during the first phase of the study. During the second phase of the study, a detailed survey was carried out on the site selected during the first phase and its feasibility was determined through data analysis and the project's design work.

The work in Malaysia was carried out by two groups of JICA Team members. One group was responsible for formulating improvements in the institution and organizations related to fish distribution. The other group was responsible for planning improvements in fish distribution facilities.

The work flow chart of the study is shown in Fig.I.2.1.

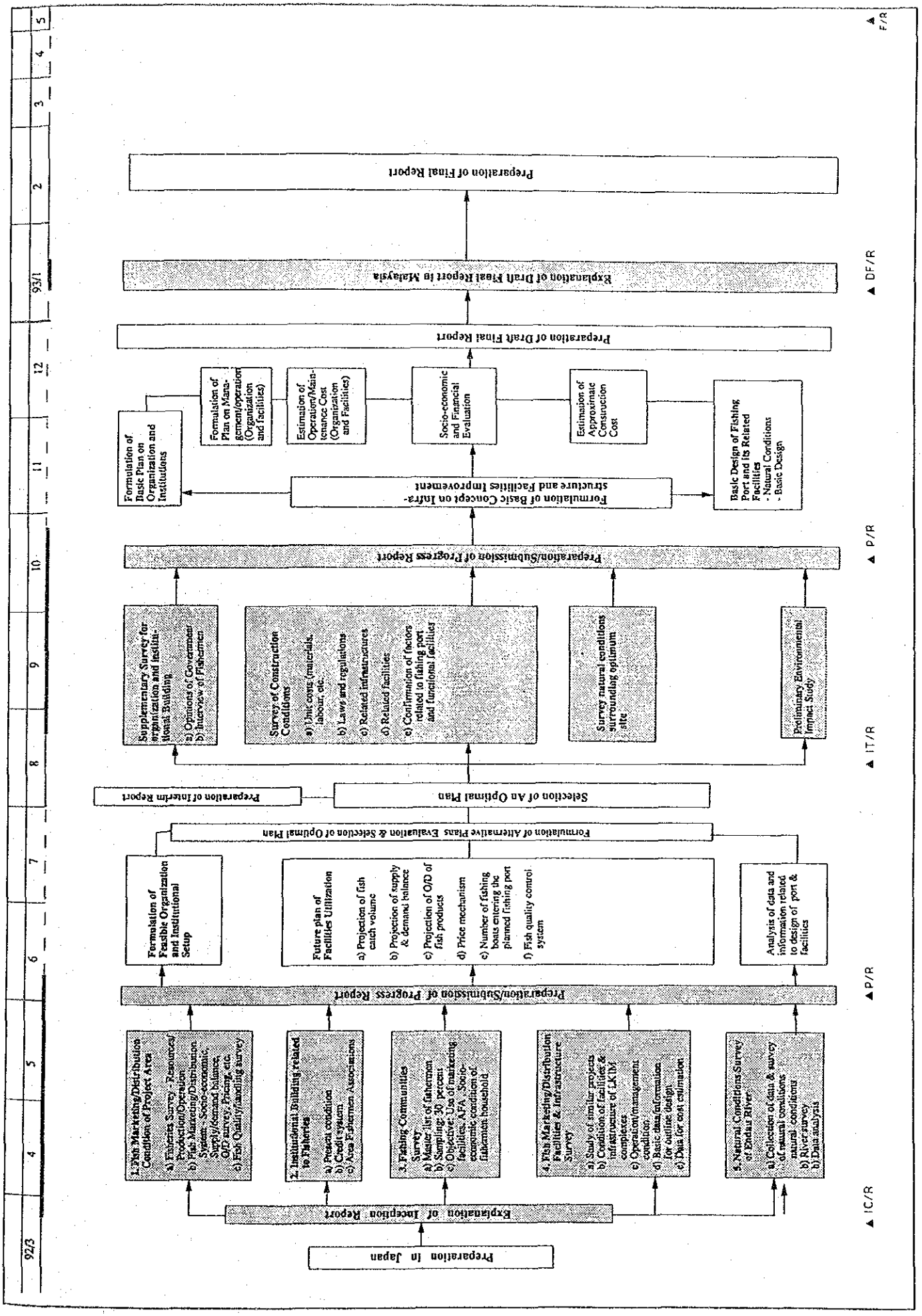

Fig. I.2.1 Work Flow Chart of the Study

II. PRESENT CONDITIONS

II. PRESENT CONDITIONS

1. National Policy

1.1 National Economy and Progress

(1) Performance in Fifth Malaysia Plan (FMP) (1986-1990)

The economic performance during the Fifth Plan period (1986-1990) has been remarkably good as shown by socio-economic indicators (Table II.1.1), although the economy experienced extreme changes in its growth performance due to the recession in 1985 and 1986. This remarkable performance can be attributed to the strong adjustment measures taken since 1983 to consolidate the public sector and reduce budgetary deficits, and to maintain a stable and sustainable rate of economic growth. Overall the Gross Domestic Product (GDP) grew by 6.8 per cent per annum in comparison to the target of 5.0 percent in the Fifth Plan. During the height of the recession, the GDP registered a negative growth of 1.1 per cent in 1985 and improved only marginally to 1.2 percent in 1986. Thereafter the overall GDP has shown increased growth. The GDP increased from RM 57,752 million in 1986 to RM 79,155 million in 1990; and the growth was led by the manufacturing and mining sectors, mainly oil and gas. The manufacturing sector grew from RM12.1 million (annual growth rate of 7.5%) in 1986 to RM21.3 million (15.5%) in 1990, and its share of the GDP was about 27 percent in 1990. The agricultural sector experienced a decreased growth rate from 4.2 percent in 1986 to 0.1 percent in 1990, and its share of the GDP dropped from about 21 percent in 1986 to 19 percent in 1990. The per capita GDP increased from RM3,587 in 1986 to RM4,447 in 1990.

(2) OPP2 -NDP

The second Outline Perspective Plan (OPP2) covering the period 1991-2000 has been formulated based on the New Development Policy (NDP) that sets the broad objectives, strategies and targets in development, similar to the New Economic Policy (NEP) in the First Outline Perspective Plan (OPP1, 1970-1990). This policy emphasizes the principle of balanced growth with equity, in order to further alleviate poverty and eliminate economic imbalance.

(3) Sixth Malaysia Plan (SMP) (1991-1995)

The Sixth Malaysia Plan (1991-1995) is the first phase of the OPP2 (1991-2000). Under the Sixth Malaysia Plan, the Malaysian economy is expected to grow at an average rate of 7.5 percent per annum and the agricultural sector is expected to grow at 3.5 percent per annum. The GNP is expected to be about RM205,000 million by the year 1995, while per capita income is expected to reach RM10,200.

1.2 Fisheries Sector

(1) Performance

Fisheries is one of the sources of growth in the agricultural sector that grew by 4.6 percent per year, higher than 3.1 percent attained in the Fourth Malaysia Plan. Fisheries production increased by 7.6 percent for marine production and 7.9 percent for aquaculture (Table II.1.2). Deep-sea fishing and aquaculture contributed mainly to the increase in production. Landings from deep-sea fishing rose from 18,300 MT in 1985 to 100,000 MT in 1990, while aquaculture production increased from 51,000 MT in 1985 to 75,000 MT in 1990. Simultaneously, 125 artificial reefs were established to propagate fish concentration as part of the overall program to conserve and enhance coastal fisheries. Under the support services, the LKIM, in order to strengthen the fisheries marketing system, established seven fisheries complexes equipped with freezer and ice facilities. The fish auction system was also launched to maximize returns to fishermen.

(2) Prospects

The potential in the fishing industry is bright in deep-sea fishing and brackish water fish culture. Due to a depletion of coastal fisheries resources, the future development in the fisheries sector will emphasize on deep-sea fishing and aquaculture in fresh and brackish water. The production of marine fish will be affected by offshore catches that will grow at a slower rate of 3.5 percent annually, to 984,000 MT in 1995, despite the expansion of deep-sea fishing activities. However, aquaculture production is projected to grow at a higher rate of 8.4 percent annually to reach 113,000 MT in 1995 (Table II.1.2).

Programs to conserve and enrich coastal fish resources will continue through development of artificial reefs and creation of marine parks for continuous reproduction of fish. Efforts at promoting deep-sea fishing will concentrate on broadening its network with proper management and the provision of good support services, particularly infrastructure, such as landing centers for deep-sea fishing boats of 40 GRT and above. Most of the centers will be equipped with boat repair facilities. Dissemination of information on research findings and viability of deep-sea fishing will be done through DOF training centers.

An efficient marketing and distribution system for fish will be set up to increase the incomes of fishermen and entrepreneurs and to meet consumer requirements. Training will be provided in fish handling, storage, reduction of post-harvest losses, and improvements of the market network. Aquaculture will be commercialized to meet domestic and international demand. Downstream processing activities will be supported by R&D at MARDI to increase fisheries value added.