

Japan International Cooperation Agency, Japan

No. 1

The Ministry of Agriculture, Lands, Forestry, and Fisheries,  
St. Lucia

**BASIC DESIGN STUDY REPORT  
ON  
FISHERIES DEVELOPMENT PROJECT  
(PHASE III)  
IN  
SAINT LUCIA**

**DECEMBER, 1994**

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(PHASE III) IN SAINT LUCIA

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Overseas Agro-Fisheries

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**DECEMBER, 1994**

**Overseas Agro-Fisheries Consultants Co., Ltd.**



## PREFACE

In response to a request from the Government of St. Lucia, the Government of Japan decided to conduct a basic design study on the Fisheries Development Project (Phase III) and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to St Lucia a study team headed by Senichi Kimura, Deputy Director, Second Basic Design Study Division, Grant Aid Study & Design Department, JICA and constituted by members of Overseas Agro-Fisheries Consultants Co., Ltd., from July 17 to October 13, 1994.

The team held discussions with the officials concerned of the Government of St. Lucia, and conducted a field study at the study area. After the team returned to Japan, further studies were made. Then, a mission was sent to St. Lucia in order to discuss a draft report, and as this result, the present report was finalized.

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 St. Lucia for their close cooperation extended to the teams.

December 1994



Kimio Fujita  
President

Japan International Cooperation Agency

Mr. Kimio Fujita,  
President  
Japan International Cooperation Agency  
Tokyo, Japan

Letter of Transmittal

We are pleased to submit to you the basic design study report on the Fisheries Development Project (Phase III) in St. Lucia.

This study was conducted by Overseas Agro-Fisheries Consultants Co., Ltd. under a contract to JICA, during the period July 13, 1994 to December 30, 1994 in conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of St. Lucia and formulated the most appropriate basic design for the project under Japan's grant aid scheme.

We wish to take this opportunity to express our sincere gratitude to the officials concerned of JICA, the Ministry of Foreign Affairs, and Ministry of Agriculture Forestry and Fisheries. We would also like to express our gratitude to the officials concerned of the Fisheries Department of St. Lucia, the Embassy of Japan in Trinidad and Tobago for their cooperation and assistance through our field survey.

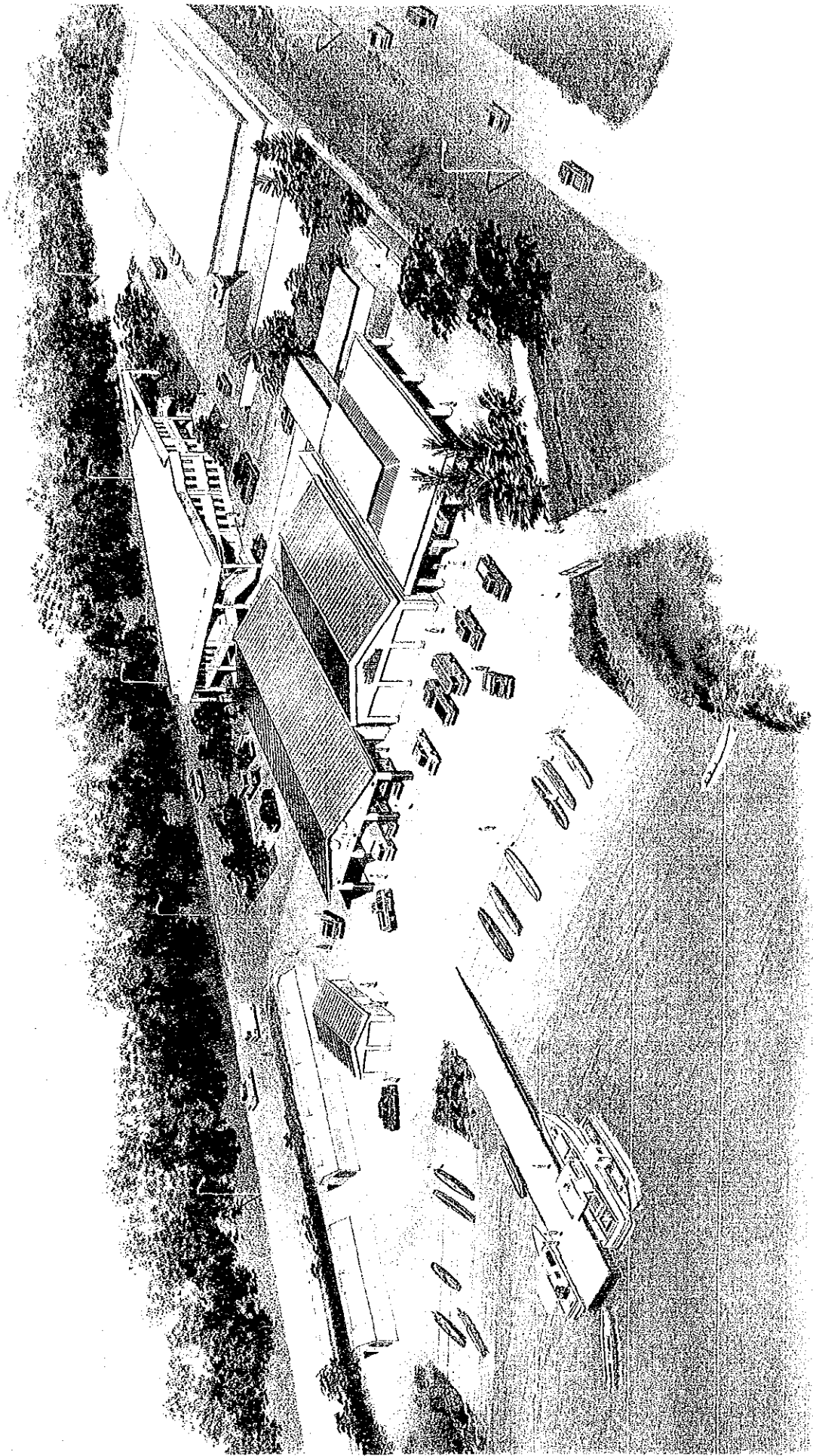
Finally, we hope that this report will contribute to further promotion of the project.

Very truly yours,



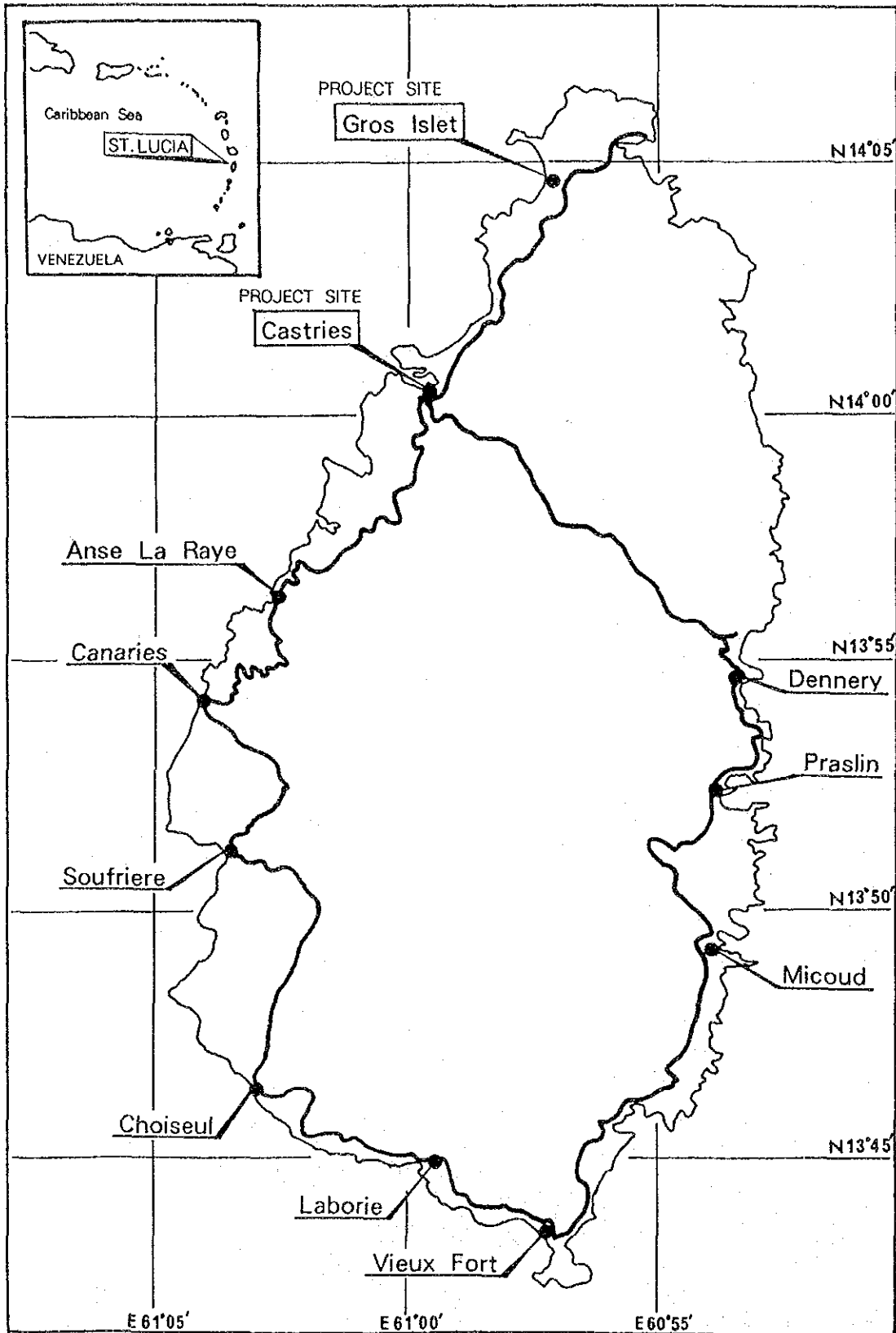
Kazumi Iida  
Project manager,  
Basic design study team on  
the Fisheries Development Project (Phase III)  
St. Lucia





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CASTRIES FISHERIES COMPLEX  
St. Lucia



## SUMMARY

Saint Lucia is an island country lying in the eastern part of the Caribbean Sea. It became independent of Britain in 1972. With a land area of 616 square kilometers, the country has a population of some 138,000. The economy depends heavily on agriculture and tourism.

The country's main industry is banana production which accounts for nearly 60% of total exports. Although banana production and export has grown thanks to a privilege granted by Britain, the country faces a difficult situation in the near future when the special protective measures existing in the EU markets are lifted, exposing the industry to stiff international competition. Efforts are being made to diversify the nation's industry as a whole in anticipation of this situation; and as one part of this, there is a need to promote the development of the fishing industry.

The nation's fishing industry plays an important role in providing its coastal residents with job opportunities and sources of cash income, and people across the nation with protein sources. However, its scale is not yet large enough to fully satisfy internal demand, necessitating the import of large amounts of marine products.

The fisheries use traditional wooden canoes and this largely restricts the scope of activity of the fishermen. For this reason, there is a need to introduce modern fishing boats and to develop and introduce the use of modern fishing gear and methods.

Furthermore, fish landings are concentrated within a certain time period of the year, making it impossible to sell out the whole catch during the bumper period or at times of a large catch, while during lean periods, there is a marked drop in catches. This unfavorable situation, in turn, dampens the fishermen's desire to catch fish, constituting a factor behind limited fish production as well as destabilizing the supply to consumer markets. Therefore there is a need to purchase and preserve excess fish at times of a large catch to create a stable supply for consumer markets. In response, the Government of St. Lucia set up the Fish Marketing Corporation, Ltd. in 1984 to purchase, store and sell fish, but because of insufficient refrigeration and cold storage capacities, the above goal has not yet been achieved.

In order to promote the development of fisheries by meeting all these needs, the Government of St. Lucia made a series of plans to strengthen supply networks by expanding refrigeration and cold storage facilities, to construct facilities of the Fisheries Department which is in charge of fisheries development and education, to introduce fishing equipment and materials necessary for these activities, and to improve the facilities of local fishing villages. The

government then requested the Japanese Government to provide grant aid in carrying out these plans.

In response to this request, the Government of Japan decided to conduct a basic design study. The Japan International Cooperation Agency accordingly sent a basic design study team to St. Lucia, and the team conducted a field survey in the country from July 17 to August 13, 1994. After returning to Japan, the results of the survey and material collected were examined and the basic design of the Fisheries Development Plan including the procurement of facilities, materials and equipment was set. Following which, the Japan International Cooperation Agency dispatched the team to Saint Lucia for explanation of the draft report, final discussion and confirmation of the contents of the basic design in the period from 29 October to 9 November in 1994.

As a result of this study, the team found it necessary to i) expand the refrigeration and cold storage facilities, ii) construct the Fisheries Department's facilities and introduce fishing equipment and materials necessary for its fisheries development activity, and iii) improve the fishery facilities in Gros Islet, and the team formulated a Fisheries Development Project (Phase III) comprising the following items:

1) Expanding facilities of Castries Fisheries Complex

To extend the refrigerating facilities of St. Lucia Fish Marketing Corporation, Ltd.

Freezer : 2.7 metric tons/day

Cold storage : 100 tons

To provide incidental work in connection with the expansion of the refrigerating facilities

Renovation of a part of the fish market

Construction of a new entrance/exit of the Fisheries Complex

Introduction of truck with insulated van: 2 tons × 1 unit

2) Setting up Fisheries Development Center

To construct buildings with the facilities and equipment necessary for the center from which the Fisheries Department can give guidance for fisheries development

Center building : With a total floor area of approx. 800 square meters

Workshop : Approx. 70 square meters

To introduce equipment and materials needed for research and development

Exploratory fishing boat:	Of FRP, approx. 12.7m long, with inboard engine,	1 unit
Small experimental boat:	Of FRP, approx. 10m long, with inboard engine,	1 unit
FRP boat for fishermen:	Approx. 7.6m long, with outboard engine,	20 units
Fishing gear, materials		
Laboratory equipment		
Equipment for data processing/management		
Radio equipment		
Project car:		1 unit

3) Improving Gross Islet landing port

Improvement of existing fishing port facilities, 1 set

Renovation of boat ramp

Reconstruction of fishing gear storage

Construction of a landing wharf

Renovation of other existing facilities

The period of time required to carry out the Project is estimated at about 12 months from exchange of notes.

With the aim of developing and promoting the fisheries in St. Lucia, this Project will improve the storage and distribution of fish catches, and make available fisheries facilities, equipment and materials, to conduct fisheries survey research, and guidance. The Project executing agency is well equipped to administer and operate the planned facilities, equipment and materials. The Project is expected to produce the following effects:

- 1) Refrigeration and cold storage capacities will be expanded so that more excess fish will be purchased during the bumper period. This will give fishermen an incentive for greater production, revitalizing their activity. This will in turn combine with improvements in fishing boats, gear and methods to increase fish catch and stabilize supply for consumer markets.

When fish catch is increased and the goal set by the Fish Marketing Corporation, Ltd. for its purchase is met, the nation's current monthly fish supply of about 99 tons during the peak season and 67 tons during the lean period will increase to 106 tons and 94 tons, respectively.

- 2) Research and consulting activities conducted by the Fisheries Department for fisheries development will be enhanced and streamlined, becoming a driving force behind fisheries development.
- 3) The existing fisheries facilities in Gros Islet will become available as the landing port as originally intended, and serve as a base for local fishermen. As a result, local fishermen will be able to perform efficient, revitalized fishing operations.

The Project will greatly contribute to fisheries development and promotion in St. Lucia, its effects extending not only to fishermen but also to the general population. Given these benefits, the basic design study team judges the Project's implementation in the form of a grant aid project of the Government of Japan both significant and appropriate.

# CONTENTS

PREFACE

LETTER OF TRANSMITTAL

MAP

SUMMARY

CHAPTER 1	BACKGROUND OF THE REQUEST .....	1
1.1	Background of the Request .....	1
1.2	Outline of the Request and Main Components .....	2
CHAPTER 2	OUTLINE OF THE STUDY.....	4
CHAPTER 3	CONDITIONS INVOLVING THE PROJECT.....	7
3.1	Fisheries.....	7
3.2	St. Lucia Fish Marketing Corporation, Ltd. (FMC) .....	12
3.3	Gros Islet Landing Port .....	18
3.4	Fisheries Department.....	20
3.5	Development principles.....	24
3.6	Aid Projects Implemented by Other Countries, Interna-tional Organizations, etc. ....	26
3.7	Aid Projects Implemented by Japan .....	26
3.8	Conditions of Project sites .....	29
3.8.1	Castries Fisheries Complex .....	30
3.8.2	Gros Islet .....	33
3.9	Environmental problems .....	35
CHAPTER 4	CONTENTS OF THE PROJECT .....	37
4.1	Basic Concept of the Project .....	37
4.2	Objectives of the Project .....	40
4.3	Project Implementation System.....	41
4.3.1	Fisheries Development Center .....	42
4.3.2	Castries Fisheries Complex .....	45
4.3.3	Gros Islet landing port .....	46

4.4	Basic Design.....	48
4.4.1	Design Principles.....	48
4.4.2	Examination of Design Conditions .....	49
4.4.3	Basic Plan .....	64
4.5	Construction Plan .....	105
4.5.1	Construction Principles .....	105
4.5.2	Points to Note for Construction Work.....	107
4.5.3	Work Supervision Plan.....	108
4.5.4	Equipment and Materials Procurement Plan .....	108
4.5.5	Implementation Schedule .....	109
4.6	Costs to be paid by St. Lucia Government .....	111
4.7	Technical Cooperation .....	111

CHAPTER 5	PROJECT EVALUATION AND RECOMMENDATIONS .....	113
5.1	Project Effects .....	113
5.2	Appropriateness of the Project .....	116
5.3	Recommendations .....	117

#### APPENDIX

1.	List of Member of the Survey Team .....	A-1
2.	Schedule of the Survey.....	A-2
3.	List of Persons Met by the Study Team .....	A-5
4.	Minutes of discussions .....	A-7
5.	FMC' Refrigerating Facilities Operating Plan and Expenses .....	A-17
6.	Exploratory Fishing Boat Operation Expenses .....	A-24



## CHAPTER 1 BACKGROUND OF THE REQUEST

### 1.1 Background of the Request

Fisheries in Saint Lucia play an important role in providing coastal residents with job opportunities and hence sources of cash income, and the nation's people as a whole with sources of protein, but because of their minute scales, production is not yet capable of meeting internal demand.

Aware of the importance of its fisheries, the Government of St. Lucia has worked to promote the development of the nation's fishing activities in cooperation with Canada, Japan and other countries. With assistance from Canada's CIDA, a fisheries development program was formulated in 1976, and in 1984, the Castries Fishery Complex, a facility in the country's capital of Castries, was constructed. Japan also received requests for cooperation from the Government of St. Lucia. In response, between 1988 and 1989, small-scale fishing facilities, and fishing boats and gear were provided for provincial fishing villages where Japan's assistance programs did not overlap CIDA's, and in Castries, a fish market was built; furthermore in 1993, a fishing port construction program was carried out at Dennery, the leading fishing village on the east coast of the nation.

Fisheries in St. Lucia are small scale, using traditional wooden canoes; this greatly limits their scope of activity. Because of this, there are needs to introduce modernized fishing boats, to develop and spread more effective fishing gear and methods, and to find new fishing grounds. Moreover, although landings are concentrated in the period from January to June when under favorable weather conditions, migratory fishes approach the island, after this period, the catch drops drastically. Ideally sufficient stores should be accumulated during the peak season to accommodate for the lean period, however, due to the indirect limitation on the number of fishing days caused by the lack of sufficient refrigeration and distribution facilities, the stores for the lean period are insufficient. As a result, imports of marine products matches the domestic catch. In response, there is a need to utilizing landed fish fully for a stable supply. To this end, there is a need to construct or expand storage and distribution facilities. In addition, there is another need to open up new offshore fishing grounds, as well as to introduce modernized fishing boats and develop new fishing gear and methods.

Although these needs have been addressed under various fisheries projects, the results are not yet satisfactory enough, and work must continue on the construction of fishery and storage and distribution facilities, the introduction of new types of fishing boats, and the development and spread of fishing gear and methods. Furthermore, for the purpose of promoting these

development and implement these instructional programs, the center about which the programs are carried out, namely, the Fisheries Department, needs to be reinforced and better equipped.

Under these circumstances, the Government of St. Lucia made a series of plans to introduce equipment and materials needed to expand fishing facilities, construct the Fisheries Department's facilities, and help the department conduct research and instructional activities. It then requested the Government of Japan to offer grant aid to realizing these plans.

## **1.2 Outline of the Request and Main Components**

The request from the Government of St. Lucia was made — in continuation with the fisheries development projects thus far implemented with the help of Canada, Japan and other countries — to achieve the common, final objective of promoting the development of the nation's fisheries by expanding fish storage and distribution infrastructure; by constructing the Fisheries Department's facilities; and by providing the Department with equipment and materials required for fisheries development.

The expansion of the fish storage and distribution facilities involves extending the refrigeration facilities of the Fisheries Complex, located at the nation's capital of Castries and improving and expanding the fisheries facilities existing in the provincial fishing village of Gros Islet. The part of the program involving the Fisheries Department consists of constructing facilities required for fisheries development through survey and instructional activities, and the introduction of equipment and materials necessary for survey and research work, and providing instruction for fishermen.

The facilities and equipment requested are outlined below.

- 1) Expanding the Castries Fisheries Complex  
Construction of refrigerating facilities
- 2) Constructing the Fisheries Department's research and instructional facilities  
Multipurpose facilities, including training rooms, study and research rooms, and workshops
- 3) Equipment and materials
  - a) Exploratory fishing boat: Of FRP, approx. 12 meters long, 1 unit

- b) Small experimental fishing boat: Of FRP, with inboard engine, 2 units
  - c) FRP boat: With outboard engine, 20 units
  - d) Fishing gear materials
  - e) Motor vehicles
    - Truck with insulated van of 2 ton capacity, 1 unit
    - Project car, 1 unit
  - f) Laboratory equipment
  - g) Equipment for data processing/management
  - h) Radio equipment
- 4) Expansion of the Gros Islet landing port

The Project will be executed by the Fisheries Department, the Ministry of Agriculture, Lands, Forestry and Fisheries. However, the refrigerating facilities of the Castries Fisheries Complex will be managed and operated directly by the St. Lucia Fish Marketing Corporation, Ltd. (FMC) under the guidance of the Fisheries Department. In addition, Gros Islet landing port will be managed and operated by Gros Islet Fishermen's Cooperative under the guidance of the Fisheries Department.

## CHAPTER 2 OUTLINE OF THE STUDY

In response to the request from the Government of St. Lucia for cooperation in its Fisheries Development Project, the Government of Japan instructed the Japan International Cooperation Agency (JICA) to conduct a study on the Project. JICA then dispatched a basic design study team, headed by Mr. Senichi Kimura, Deputy Director, Second Basic Study Division, Grant Aid Study and Design Department of JICA, to St. Lucia. The team conducted a field survey (third phase) in the country from July 17 to August 13, 1994.

The team discussed the background of the Project; the contents of the Project and the request; the Project implementation, operation and maintenance plans; and other matters of mutual interest with representatives from the Government of St. Lucia's Foreign Affairs Ministry, Planning Ministry, Agriculture, Lands, Fishery and Fisheries Ministry, and Fisheries Department. The team then surveyed fishery facilities and fishing villages in various parts of the country to determine actual fishing operations done there, the management, operation, maintenance and other conditions of the facilities thus far constructed or improved with international assistance. It also surveyed the Castries Fisheries Complex and the Gros Islet landing port, both of which are among the objects of the Project, to determine their actual conditions. During the survey of the Complex, discussions were held with the Fish Marketing Corporation, Ltd., and the operation, management and maintenance of the complex's facilities were surveyed. During the survey of the Gros Islet Fish landing port, discussions were held with the Fish Marketing Corporation, Ltd. and interviews were conducted with a large number of fishermen and residents in and around the port. In light of the results of these surveys, the team discussed the contents of the Project further with the Fisheries Department and other government agencies concerned.

Based on the results of the survey, final analysis were conducted after returning to Japan and a draft final report was compiled. A Draft Report Explanation Team headed by Mr. Satoshi Kuwahara, Section Chief, International Affairs Division, Oceanic Fisheries Department, Fisheries Agency, Ministry of Agriculture, Forestry and Fisheries was sent by the government of Japan through JICA to St. Lucia from October 29 to November 9 of 1994 to conduct final discussions about and confirm the basic design.

This report based on the results of the above surveys, encompasses an evaluation of the background, necessity, appropriateness of the project, the basic design and an overall evaluation of the project.

The composition of the study team, the study schedule, the counterparts and related persons in St. Lucia, the contents of discussions with them are as shown in the APPENDIX section attached to the end of this report.



## CHAPTER 3 CONDITIONS INVOLVING THE PROJECT

### 3.1 Fisheries

#### (1) Overview

Fishing in St. Lucia is of a minute-scale coastal type carried on by people of villages dotted along the island's shore.

Fishermen: Approx. 1,400 (approx. 800 of them full-time)

Fishing boats and methods: There are about 380 boats, the majority of which are accounted for by wooden canoes (Dugouts, with wooden boards added on the hull to provide enough freeboard, ranging in length from 5 to 8 meters). With recent efforts at modernization under the guidance of the Fisheries Department, the trend is a shift away from old wooden canoes towards FRP boats. The majority of the fishing boats are equipped with outboard engines (from 25 to 80 horsepower).

Fishermen and fishing boats

Fishing village	Fishermen			Fishing boats			
	Full-time	Part-time	Total	FRP boat	Wooden canoe	Wooden boat	Total
Gros Islet	69	41	110	15	4	12	31
Castries	137	69	206	20	35	20	75
Anse-la Raye	52	46	98	4	17	2	23
Canaries	45	38	83	3	21	8	32
Soufriere	73	48	121	14	33	20	67
Choiseul	86	51	137	2	14	0	16
Laborie	62	38	100	8	19	0	27
Vieux Fort	121	68	189	18	21	1	40
Micoud	60	61	121	9	10	0	19
Dennerly	108	74	182	22	31	0	53
Total	813	534	1,347	115	205	63	383

Source: Fisheries Department

Main fishing methods include hand-lining for demersal fish, trolling for large pelagic fishes, gill netting for small pelagic fishes like flying fish, basketing for demersal fish, and diving. A more recent method is longlining being tried in waters southwest of the island to catch tuna, under the guidance of the Fisheries Department. In any of these methods, the small boats make it impossible to stay in fishing grounds for an extended period of time and the rule is a single day's operation.

Fishing activity is subject to seasonal variations. Large pelagic fish approach the island between January and June, and during this bumper period, trolling is done for tuna, dolphin, kingfish and other fish. Of the usual annual catch of approximately 1,000 tons, around 70% is caught during this period. (About 60% of the annual total consists of the three species mentioned.) Between July and December, there are far fewer large pelagic fishes approaching the island. Because of rough seas, there are also much fewer fishing opportunities available. These two factors combine to reduce the catch markedly during this lean period.

Most of the fishing villages are situated on the west coast of the island that is downwind of the northeasterly trade wind and faces relatively calm waters. On the east coast of the island, northeasterly wind is constantly blowing, and this wind and rough waves directly striking the seashore from the Atlantic contribute to harsh weather conditions for fishing activities. Notwithstanding being in this area, Dennery which is near to fishing grounds has become a leading fishing base: In March 1994, the fishing port of Dennery was completed with Japan's grant aid. Vieux Fort, also being close to fishing grounds, at the southern tip of the island, enjoys the largest catch in the country.

Catch by species

	Tuna	Dolphin	Kingfish	Flying fish	Shark	Others	Total
1987	75	61	29	4	67	95	331
1988	133	102	32	4	84	59	414
1989	112	77	21	45	91	104	450
1990	142	98	27	57	117	132	573
1991	226	257	79	47	430		1,038
1992	223	239	150	32	4	320	968
1993	321	208	141	89	8	348	1,114

Source: Fisheries Department



### Monthly catch (1993)

	In tons												
Month	1	2	3	4	5	6	7	8	9	10	11	12	Total
Catch	162	147	192	95	98	89	53	51	64	60	50	63	1,114

Source: Fisheries Department. Estimated from catch records by landing point and month

#### (2) Fishermen's cooperatives

Under the guidance of the Associations Ministry and the Fisheries Department, fishermen are rapidly being organized into fishermen's cooperatives. Some cooperatives offer their member fishermen a wide variety of services, including the selling of fuel oil and fishing gear materials and the handling of their catches.

Locations of fishermen's cooperatives:

Gros Islet, Castries, Anse-la-Raye, Canaries, Soufriere, Choiseul, Laborie, Vieux Fort, Micoud, Proslin, and Dennery

In order to sell fuel oil to fishermen as a service, many fishermen's cooperatives are equipped with filling station in tie-ups with local fuel supply companies. Under a tax exemption scheme for fishermen implemented by the Government of St. Lucia, the fishermen's cooperatives keep a record of the volume and amount of each purchase made by a member fisherman, and upon receipt of a refund of the amount equal to the difference between the regular price and the tax-free special price, they pass it on to the fisherman involved.

Fishermen's cooperatives do not generally engage in the direct purchase and selling of catches, but major ones are engaged in their shipment in cooperation with the Fish Marketing Corporation, Ltd. (see section 3.2).

#### (3) Marketing of fish catch

##### 1) Overview

Fish catch is subject to seasonal changes. In recent years, the annual catch has been about 1,000 tons, about 70% of which is landed during the bumper period lasting from January to June. During this period, a large catch leads to excess supply. Conversely, during the lean period from July to December, the quantity of fish entering the markets drops substantially.

Fish marketing modes may be divided into three main categories:

- a) Direct sale from fisherman (or fish dealer) to consumer: Share is estimated at about 60% of the total catch.
- b) Purchase by middleman and sale from middleman to hotel and restaurant: Share is estimated at about 15%.
- c) Purchase and sale by St. Lucia Marketing Corporation, Ltd. (FMC): Share is estimated at about 25% (actual figures).

Catch is first sold by fishermen or fish dealers directly to consumers at each point of landing, and after immediate demand has been met, any excess fish are transported to Castries and other locations for sale.

In Castries, with the largest population in the country, fishermen or fish dealers from neighboring areas sell the fish they bring in directly to consumers on the street.

The scale of the market in each point of landing is small. Although any excess fish are carried to other areas for sale, both the scope of marketing and the quantity are limited as long as the sale is done individually by fishermen or fish dealers. For this reason, when there is a large catch during the bumper period, excess fish are often discarded, as witnessed by the study team. Conversely, during the lean period, there are days when no fish are available.

Under these circumstances, St. Lucia Fish Marketing Corporation, Ltd. (FMC) plays an important role in the marketing of marine products. Since its foundation in 1984, the Corporation has been engaged in the purchase, collection and sale of fish at the Castries Fisheries Complex, built with assistance from Canada's CIDA for the main purpose of fish processing and refrigeration, and at the local (Laborie, Anse-la-Raye) icing and refrigeration facilities built with a Japanese grant. FMC is the nation's only public organization engaged in the marketing and sale of fish, and as such, it contributes greatly to the purchase of excess fish during the bumper period and the supply of fish to markets during the lean period. In addition to FMC, individual middlemen purchase fish from fishermen and sell these to hotels, restaurants and other large consumers.

However, despite its efforts to stabilize supply for consumer markets by purchasing excess fish from local areas, FMC is now unable to purchase all of the excess fish capacities of its processing and refrigeration facilities. During the bumper period, therefore, there are days when fishermen are forced to give up going out to fish.

Fish exports are virtually negligible. In the country, FMC alone has refrigerating facilities capable of cold-storing fish for sale.

## 2) Marine-product imports

About 900 tons of fish and marine products, equalling the domestic catch, are imported annually. This amounts to 8 to 9 million EC dollars (about 3 million U.S. dollars), accounting for as much as from 5 to 6% of the nation's total imports.

Imported fish and processed products: 900,4 tons (1993)

### Breakdown

Frozen fish, shrimp	:	92.8 tons
Smoked or otherwise processed fish	:	108.6 tons
Salted dried fish	:	262.5 tons
Canned or otherwise processed product	:	435.5 tons
Live fish, including fish for breeding	:	1.0 ton

Main exporters include the United States, Guyana, Trinidad and Tobago, Barbados, and Jamaica.

The majority of frozen fish and shrimps are imported and sold by FMC.

Before importing fish, an import permit must be applied for and obtained from the Ministry of Commerce: Any import application is forwarded by the Ministry of Commerce to the Fisheries Department, which sees that there is no fish of the same species carried in stock. If there are any of the same species at FMC, the importer is instructed to purchase from FMC, and no import permit is issued to him. In other words, imports of frozen fish are restricted to some extent.

## 3) Distribution and consumption of the domestic fish catch

According to data and reference material collected during the field survey, fish is caught domestically as follows:

Domestic fish catch = 1,000 tons/year

Of this quantity, 70% or 700 tons are landed between January and June, while the remaining 30% or 300 tons between July and December.

The domestic catch of 1,000 tons is distributed as follows:

Approx. 75% (745 ton) is marketed as fresh fish directly from landing areas.

Approx. 25% (255 ton) is marketed through FMC.

Fish exports are practically negligible, so that the above-mentioned catch may be regarded as being consumed entirely in the country. This translates into 7.2 kg in average annual consumption per capita, which is a very low figure considering the people's great preference for fish, indicating that there is room to grow in both consumption and production.

### **3.2 St. Lucia Fish Marketing Corporation, Ltd. (FMC)**

This corporation was set up as a business enterprise under the control of the National Development Center (NDC) by the Government of St. Lucia in October 1984 in order to promote fisheries in the country.

#### **(1) Business purposes**

FMC's purposes are as follows:

To promote the development of fisheries in the interest of fishermen by increasing fish production through the purchase of catches at reasonable prices.

To improve the quality of fish products and stabilize supplies and prices by engaging in the processing and selling of purchased fish.

To engage in fish imports and exports.

To construct, operate and manage a fisheries complex equipped with facilities needed to perform these operations.

#### **(2) Supervision and organization**

FMC is a publicly-run corporation under the supervision of NDC. It is operated and managed by a Board of Directors consisting of the following seven directors:

Designated by NDC	:	4
From the Finance Ministry	:	1
From the Fisheries Department	:	1
Representative of fishermen's cooperatives	:	1

With General Manager at the head, FMC's personnel consist of the following:

At the Castries Fisheries Complex

Financial controller	:	1
Secretary and accounts clerks	:	5
Plant supervisor	:	1
Refrigeration supervisor	:	1
Fish processors and freezer men	:	10
Plant maintenance supervisor and mechanic	:	2
Retail shop supervisor and sales clerks	:	3
Collection truck drivers	:	2

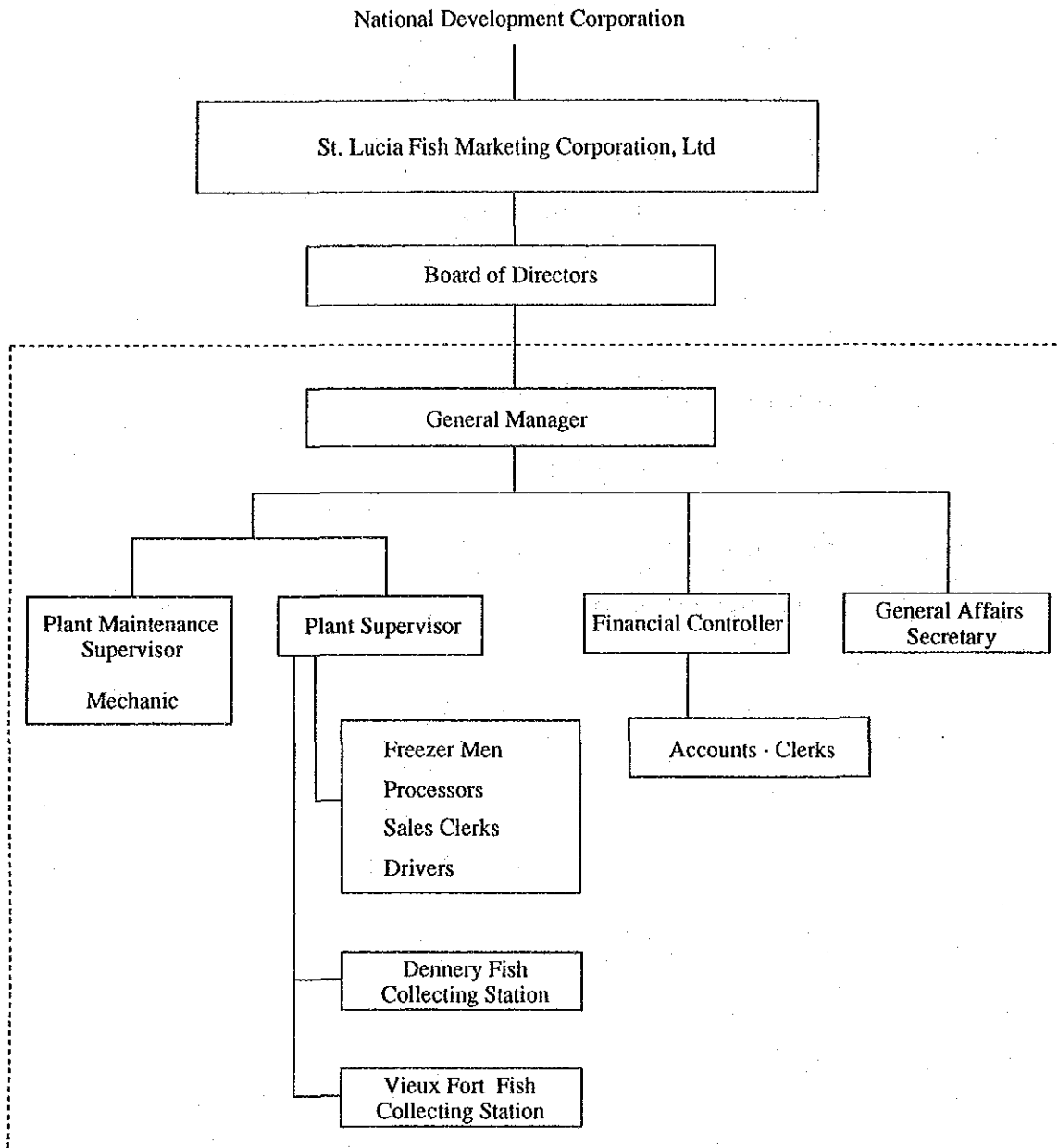
**At Vieux Fort Fish Collecting Station**

Purchasing officer and assistants	:	3
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**At Dennery Fish Collecting Station**

Purchasing officer and assistant	:	2
----------------------------------	---	---

FMC's organization chart



Number of FMC's personnel: 31

(3) FMC's facilities and equipment

FMC operates the following facilities and equipment to perform its operations:

1) Castries Fisheries Complex

Blast freezer	2.7 tons/day	(6,000 lbs.)	= Built with CIDA's grant aid
Cold storage	70 tons	(150,000 lbs.)	
Ice plant	4.5 tons/day	(10,000 lbs.)	

Cold storage attached to fish market	9 tons	(20,000 lbs.)	= Built with Japan's grant aid
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40-foot refrigerated container	18 tons	(40,000 lbs.)	= Rented by FMC
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2) Vieux Fort Fish Collecting Station

Insulated container

3) Laborie Fisheries Center

Ice plant	1.8 tons/day	(4,000 lbs.)	= Built with Japan's grant aid. FMC uses these facilities with electricity and water charges on FMC's account.
Cold storage	9 tons		

4) Anse-la-Raye Fisheries Center

Ice plant	1.8 tons/day	(4,000 lbs.)	= same as above
Cold storage	9 tons	(20,000 lbs.)	

5) Dennery Fish Collecting Station

Ice plant	1.8 tons/day	(4,000 lbs.)	= same as above
Ice storage	9 tons	(20,000 lbs.)	

(4) Purchasing and collecting

Fish collecting stations are located at two main points of landing: Vieux Fort in the south of the island, and Dennery in the east.

With its own purchasing staff and in collaboration with the local fishermen's cooperative, each station purchases fish catches, and FMC dispatches trucks with insulated vans from Castries to collect them. At the Laborie and Anse-la-Raye Fisheries Centers are ice plants and cold storages installed with Japan's grant aid. These items of equipment are used to supply ice necessary for collecting and transporting fish from provincial fishing villages and to store purchased fish temporarily. The ice plant and storage among the Dennery fishing port facilities completed in March 1994 will also be used by FMC to purchase and collect fish.

FMC's present refrigeration and cold storage capacities are not large enough to perform its operations fully, and FMC is forced to decrease substantially the quantity of excess fish it purchases during the bumper period.

As mentioned in the preceding section, FMC's maximum refrigerating capacity is 2.7 tons/day, and its cold storage capacity totals 94.5 tons, counting the 40-foot refrigerated container, for the Castries Fisheries Complex. Even when the cold storages of the Fisheries Centers at Laborie and Anse-la-Raye are added, the maximum cold storage capacity is as small as 112.5 tons.

In contrast, the monthly catch during the bumper period ranges from to 3.5 to 7.7 tons/day, quantities that by far exceed the current refrigerating capacity. In addition, the cold storages, even including those at Laborie and Anse-la-Raye, become full as early as sometime between March and April, making it impossible to accept large quantities of excess fish from then on. This sometimes forces fishermen to restrict the number of days they go out fishing, despite the fact that they are in the bumper period.

(5) Quantity of fish handled by FMC

In recent years, FMC has purchased and sold some 250 tons of fish annually, which is equivalent to about one quarter of the total domestic production.

The 1993 figures are as follows:

Domestically purchased fish	256.60 tons
(223.5 tons of these purchased during the January to June bumper period)	
Imported fish	77.32 tons

The figures between January and June 1994 are as follows:

Domestically purchased fish	226.18 tons
(roughly equal to that for the same period of last year)	
Imported fish	50.57 tons

Excess fish (consisting mainly of tuna, dolphin and kingfish) thus purchased during the January to June bumper period in order to stabilize supplies for consumer markets are refrigerated and cold-stored to sell according to demand.

As seen from the above-mentioned past records, FMC purchases and sells fish roughly as shown below.

Nearly 90% of the total annual purchase takes place between January and June, while the remaining 10% from July to December.



Purchase quantity : From January to June 225 tons .....(1)  
 From July to December 30 tons .....(2)

FMC's stock level at the end of the bumper period (end-June), when the cold storage is full, or 112 tons, minus the average stock level of imported fish, or 7 tons, gives the stock level of domestically purchased fish at the end of June (see (3)).

Stock of domestically purchased fish at end of June : 105 tons .....(3)  
 January/June sales quantity of domestically purchased fish : 120 tons .....(1)-(3)  
 Average monthly sales quantity for January/June : 20 tons/month

Stock at the end of June plus the quantity purchased from July to December is sold during the same six-month period (see (2) + (3)).

July/December sales quantity of domestically purchased fish : 135 tons .....(2)+(3)  
 Average monthly sales quantity for July/December : 22.5 tons/month

Total domestic distribution and consumption for the entire nation, including FMC-handled quantities, are estimated to be as follows:

January/June consumption: 595 tons  
 .....January/June nationwide catch 700 tons -(3)  
 Average monthly consumption for January/June: 99 tons/month  
 ..... (20 tons/month of this quantity supplied by FMC)  
 July/December consumption: 405 tons  
 ..... July/December nationwide catch 300 tons - (3)  
 Average monthly consumption for July/December: 67.5 tons/month  
 ..... (22.5 tons/month of this quantity supplied by FMC)

The breakdown of the buyers of these fishes is as follows:

Individual consumers	40%
Hotels and restaurants	55%
Supermarkets	3%
Others	2%

### FMC-handled quantities

In tons

Year	Catch	FMC-handled quantity			
		Purchased	Imported	Monthly total	Cumulative total
1993/ 1	162.15	43.87	1.46	45.33	45.33
2	147.37	84.01	12.03	96.04	141.37
3	192.07	70.55	3.93	74.48	215.85
4	95.33	18.77	4.59	23.36	239.21
5	88.70	2.31	6.60	8.91	248.12
6	88.68	4.06	12.20	16.26	264.38
7	53.45	1.42	7.04	8.46	272.84
8	50.66	8.57	2.50	11.07	283.91
9	63.59	9.66	6.89	16.55	300.46
10	59.70	7.66	12.45	20.11	320.57
11	49.72	3.15	7.09	10.24	330.81
12	63.09	2.57	0.54	3.11	333.92
Total for 1993	1,114.51	256.60	77.32	333.92	
1994/ 1		12.77	9.40	22.17	22.17
2		52.64	12.18	64.82	86.99
3		46.01	8.90	54.91	119.73
4		50.23	17.79	68.02	187.7
5		48.31	2.30	50.61	238.36
6		16.22	-	-	-
Total for January to June 1994		226.18	-	-	-

Source: Fisheries Department and Fish Marketing Corporation, Ltd.

### 3.3 Gros Islet Landing Port

#### (1) Overview of fisheries in Gros Islet

Gros Islet is a town located on the west coast of the northern part of the Island of St. Lucia. It has a population of 14,000 as of 1993, accounting for about 10% of the country's total. The town's fishermen operate mainly from the sandy beaches of Rodony Bay, opening westward; the beaches are used to put their boats and to land their catches.

Number of fishermen : Approx. 110 (69 of them full-time)

Number of fishing boats : Approx. 31

Annual catch : 45 to 70 tons

(Tuna, dolphin, kingfish, snappers, shark, lobster, and others)

These landed catches are in part sold by the fishermen directly to consumers (residents in the Gros Islet area) on the beach. The majority of the catch, including some going to hotels and restaurants of the area, are consumed in the area and Castries.

(2) Current conditions of the Gros Islet landing port

This port is a fishery facility constructed in the Gros Islet area with Japan's 1988 grant aid. It is located on the waterway (about 60 meters wide and about 300 meters long) between Rodony Bay, facing the open sea, and the inner bay, serving as a yacht harbor.

The facilities previously constructed with the Japanese grant aid include a rampway, lockers, a workshop and a market. Of these, the rampway has become difficult to use for fish landing operations because of its erosion, and this has lowered the utilization rate of the whole facilities, except the workshop, which is used by some fishermen for preparing their fishing gear and other purposes. Instead of the rampway, Gros Islet's fishermen use the sandy beach facing Rodony Bay to bring ashore their wooden canoes and to land their catches: There are also some fishermen who temporarily use a place some 300 meters farther into the waterway from the landing port to land their catches, by courtesy of the landowner (There is no equipment at all and only five or six FRP boats can come alongside there).

However, the use of the sandy beach facing Rodony Bay is not desirable for the two reasons given below, and the facilities under this part of the Project need to be improved for efficient fish landing.

The sandy beach does not allow bringing ashore FRP boats being introduced following the start of Japan's grant aid because the boats are too heavy to do so, making it difficult to land catch or repair the boats.

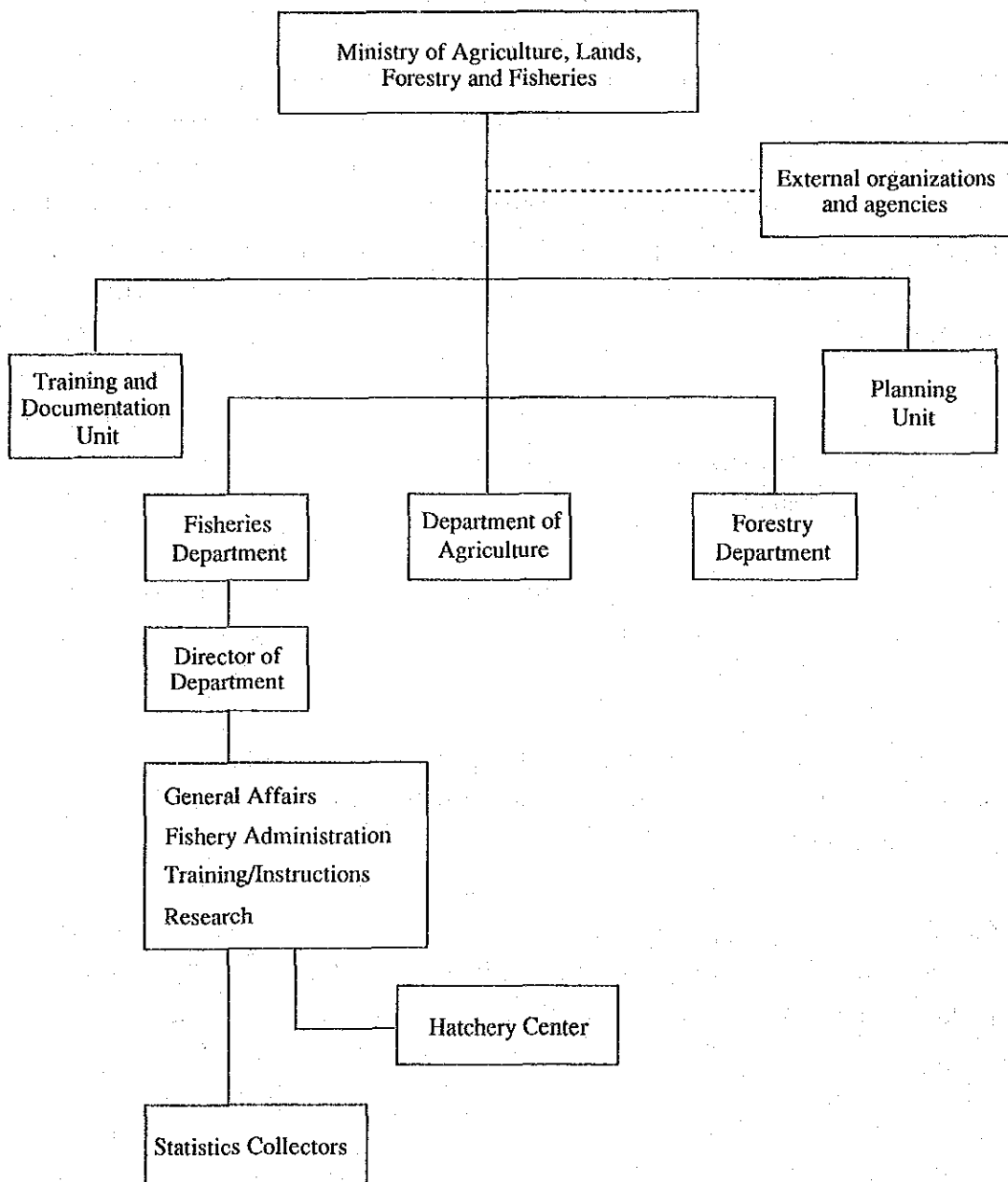
In case of stormy weather, especially a hurricane, the sandy beach as it is may be hit *directly by large waves from the open sea: This necessitates the provision of fishing facilities that are safe from such waves.*

Coincidentally, the sandy beach, which the fishermen have no choice but to use, is being considered for tourist development. According to the Ministry of Planning, this plan would substantially restrict the use of the sandy beach for fishing purposes.

### 3.4 Fisheries Department

This department falls under the jurisdiction of the Ministry of Agriculture, Lands, Forestry and Fisheries, and is in charge of national fisheries administration, the planning, implementation and management of fisheries development projects, survey and research, the spread and teaching of fishing methods, and other operations. Personnel number 42, with the Fisheries Department Director at the head, and its annual budget comes to 1.21 million EC dollars (1994).

(1) Organization chart



(2) Fisheries Department's Instructional activity

In spite of poor instructional facilities, equipment and materials available, the department conducts educational and instructional activity for fishermen and others concerned with the fisheries. The activities carried out or planned for 1994 are as follows:

1) Fishermen's registration

This is an indispensable procedure for getting the whole picture of the fishermen and the fishing activities they are carrying out. Under this program, they are registered for each point of fish landing, and the information thus obtained forms the foundation for the preparation of fishery statistics.

2) Fisheries legislation meeting

With the introduction of the new fisheries regulations (SI No. 9 of 1994) earlier this year, it is necessary to have consultations with fishermen so as to inform them and get their cooperation in assisting the Fisheries Department in administering this new area of fisheries law. These meetings will be held in every fishing area from July to September.

3) Net modification

The new fisheries laws have regulated the size of mesh or wire used for making of fish pots and nets. These modifications will be discussed in workshops held for fishermen. The program will be held during the months of October to November.

4) Navigation and safety at sea

This program seeks to train the fishermen in the use of navigational equipment in order to ensure them greater safety at sea. Fishermen will be trained in the use of compasses, flares, flash lights, life jackets, and VHF radios. The program will be carried out during the months of August and September.

5) Boat registration and licensing

This program is linked to fishermen's registration and provides information on the type of boat, size of boat, and the number of boats. The program will be completed in all the fishing areas during the period of July to September.

6) Navigation/safety and communications

This program seeks to improve and develop the knowledge and skills of the fishermen in navigation/safety and communications. Fishermen will be trained in use of the compass, marine radios, and global position system (GPS). Workshops will be held for these purposes.

7) Gear technology and guidance

This program will provide training and guidance in the preparation of different types of gear used for different types of fish. This is an ongoing program but will recommence in October 1994.

8) Fish handling and processing

This program seeks to train fishermen, women, those who have finished schooling and other unemployed persons in the community in the various techniques of proper fish handling and processing. Workshops will be held for these purposes.

9) Experimental fishing

This program is used to develop and test new fishing gear and fishing methods. These results are discussed with fishermen so that they can develop new fishing methods and use modern fishing gear. At the beginning of 1994, a fish breeding ground was built about 10 miles off Vieux Fort. Fishermen have been trained in its use with good results.

10) Inshore surveillance

This activity is carried out by Fisheries Wardens and is used to monitor illegal activities in the country's marine reserves and fishing priority areas.

11) Lobster search

This activity is carried out so as to curb the problem of illegal lobster fishing.

The Fisheries Department planned these activities and are implementing them as much as they can, however in actuality, operating from their offices rented in a privately-owned building, they are unable to conduct these activities as planned for, partly because of insufficient equipment. Virtually no dedicated space for research work is secured, and neither laboratory equipment nor equipment for data processing/management are fully provided, thus restricting the scope of work of each personnel, including the analysis and organization of samples taken from fishing places, and the storage of data and material.

Moreover, experimental preparation of fishing gear and preparations for experiments with aquaculture have to be done in the corridors of the Fisheries Department's offices. In the case of field guidance of fishermen and those involved in fisheries, which is important and must be continued, instructors go to local areas and use schools or other facilities, or outdoor places. Furthermore, when it comes to lectures or training sessions at a fixed place where local fishery advisors, fishermen's cooperative personnel and other fisheries advisors can meet, there is no such place available in the Fisheries Department. In terms of fishery equipment and materials, too, the Department is not fully equipped to develop new fishing techniques, to guide fishermen in them, or to spread such techniques among them, again substantially restricting the scope of its activity.

(3) Present operation of the Exploratory fishing boat

The Fisheries Department owns and manages one exploratory fishing boat, previously provided as a part of grant aid (approx. 11 m long, with inboard engine). The boat is operated to survey fish grounds, do experimental fishing, and perform other activities, in coastal waters, mainly off Castries and Vieux Fort. One principal example of the boat's recent accomplishments is the installation of floating fish-breeding reefs.

In fish production for the nation's fisheries development, there are continuing needs for the introduction of modern fishing boats, the development of fishing gear and methods, and other activities, especially the development of offshore fishing through the introduction and spreading of new fishing methods, such as longline fishing for tuna, through the development of new fishing grounds, and through other means.

However, the existing exploratory fishing boat cannot meet these needs in productivity, roominess, engine performance, speed and in other specifications. As such, it cannot efficiently be used to develop fishing gear, methods and grounds, particularly new fishing techniques, such as longline fishing for tuna. For instance, the Fisheries Department once equipped the boat with a longline reel and other fishing gear for experimental fishing operations, but the boat proved unstable and difficult to work on, not allowing for a practical run. In addition, without any living equipment, the boat has difficulties on long-run experimental fishing operations. Such being the case with the boat, the Fisheries Department finds it difficult to conduct necessary experimental fishing operations and surveys of fishing grounds. If the Department is to develop new fishing gear and methods, including tuna longline fishing, and new fishing grounds, it is imperative for the Department to introduce exploratory fishing boats which are equipped with appropriate fishing gear, living equipment, and other required features, and which are sufficiently mobile.

(4) Spread of fishing equipment and materials, and loan scheme for fishermen

As the project implementing agency, the Fisheries Department manages the fishing equipment and materials thus far introduced with Japan's grant aids, and with the aim of modernizing fishing means, it distributes and supplies these equipment and materials to fishermen by means of direct sales.

This sale is effected under a fishermen's loan scheme instituted in cooperation with the St. Lucia Development Bank. The department sets the price for any piece of such equipment or materials and screens fishermen desiring to buy it. The fishermen is required to make ready his own funds equal to 20 to 30% of the price, and applies for the necessary loan to the Development Bank. After screening the fishermen by inquiring with the department or otherwise, the bank signs the loan agreement with the successful fisherman and make the loan.

The selling price is deposited in the "Fisheries Development Account" opened with the Development Bank, and it is placed under strict control so that it can be used for fisheries development in the future. Under this scheme, starting with fishing equipment and materials introduced with 1987 grant aids and extending to those provided in 1994 (fishing boats and outboard motors), the funds so far deposited in the account have amounted to about 8 million EC dollars.

The loan scheme was originally implemented under the Caribbean Development Bank's guarantee, but it has now grown enough to operate on its own funds in the account alone.

In order to encourage young people to enter the fishing industry, the department has taken various measures, including the lowering of the minimum cash deposit requirement to 10%.

### **3.5 Development principles**

The Ministry of Planning's policy to diversifying the fisheries as outlined in the *St. Lucia Medium Term Economic Strategy Paper 1993-1996*, set in 1993, emphasizes the expansion of domestic fisheries to reduce the import of fishery products.

Accordingly the Fisheries Department will developing and promoting this policy based on the following guidelines.



- 1) To contribute to the creation of job opportunities and thus income-generating sources, and to the production of food for domestic consumption.
- 2) To increase domestic fish and marine-product production while decreasing their imports.
- 3) To contribute eventually to obtaining foreign currency by exporting fish.

In order to meet these goals, the Fisheries Department has set the following development principles:

- 1) The building and expansion of fishery facilities

To build or expand fish landing, conservation and distribution facilities and equipment, and other related infrastructure so as to ensure smooth, efficient production and distribution.

- 2) Development and modernization of fishing boats, gear, and methods

Efforts will be made to replace traditional small wooden canoes with new fishing boats of greater seaworthiness and fishing performance, while at the same time developing more effective fishing gear and methods, and finding and spreading the use of new fishing grounds.

Through these efforts, fishing operations will be made more efficient and production increased. In addition, the prevention of maritime accidents and safety at sea will also be examined.

- 3) Guidance and support of fishermen

Along with with the development of fishing boats, gear and methods mentioned in item 2) above, new skills will be spread among fishermen through education and instruction.

This education and instruction will include reading and writing, training in new fishing gear and methods, and practice in fishing using actual boats and gear. Importance will be attached to the guidance of young people, who will take on the responsibility of fishing in the future.

In parallel with the education and instruction, financial and other assistance programs will be worked out in order to help fishermen obtain new fishing boats and gear. These programs will include supplying fishing boats, gear and materials for fishermen under the sponsorship of the Fisheries Department, and establishing fishermen's loan schemes under the sponsorship of the Development Bank.

#### 4) Management and conservation of the marine environment

The marine environment, together with marine resources, are important "resources." The conservation of the marine environment is indispensable for the development of not only fisheries but also tourism. Efforts to be made for these purposes will include monitoring the environment, establishing its management and protection methods, and implementing and supervising these methods.

### **3.6 Aid Projects Implemented by Other Countries, International Organizations, etc.**

#### (1) Fisheries development projects

Starting in the latter half of 1970, the Government of Canada offered cooperation in formulating the Fisheries Development Project. Under this project, it extended assistance in various fields, particularly in the construction of the fish distribution facilities, and the establishment of the fisheries management system and the fishermen's cooperatives. One typical example is the construction of the Castries Fisheries Complex, completed in 1984. Since then, the country has conducted no particular activity.

#### (2) Aquacultural development

The Taiwanese Government has been extending assistance in the aquaculture of freshwater shrimp. Examples are the construction of hatcheries and nurseries. This construction activity has been followed up by training from Taiwanese specialists in aquaculture skills. The country has also emphasized the construction of privately owned nurseries, and local private aquafarmers, who, though small in scale, have already established themselves.

The Government of the United States once sent aquaculture members from the Peace Corps. This activity is now discontinued.

### **3.7 Aid Projects Implemented by Japan**

#### (1) Overview

At the request of the Government of St. Lucia for aid in the implementation of fisheries development projects, the following grant aid projects were carried out by the Government of Japan:

Year	Project Name and Main Contents	Aid Amount
	Fisheries Development Project, Phase 1	
1988	<ul style="list-style-type: none"> <li>• Construction of small-scale fishing facilities for 6 provincial fishing villages: Gros Islet, Tapion, Anse La Raye, Choiseul, Laborie and Micoud.</li> <li>• Supply of FRP boats, outboard motors, fishing gear materials, etc.</li> </ul>	290 million yen
	Fisheries Development Project, Phase 2	
1989	<ul style="list-style-type: none"> <li>• Construction of Castries Fish Market</li> </ul>	360 million yen
	Dennery Fishing Port Project	
1993	<ul style="list-style-type: none"> <li>• Construction of fishing port and supply of fishing equipment and materials for the provincial fishing village of Dennery</li> </ul>	738 million yen

Technical cooperation activities include technical guidance offered to the Fisheries Department by Japanese specialists in fisheries, starting in 1990, and short-term (6 months) guidance in the maintenance of engines given by Japanese specialist in engines, starting in March 1994.

## (2) Conditions of facilities

Current conditions of the facilities constructed under the above-mentioned cooperation projects are described below.

### 1) Facilities in provincial fishing villages

Boat ramps, fishing gear storages, fish shops and others were built at a total of seven places; from north to south on the west coast of the island, Gros Islet, Tapion, Anse-la-Raye, Canaries, Choiseul, and Laborie; and on the east coast, Micoud.

#### Anse-la-Raye, Canaries, Choiseul, and Laborie:

Fishing gear storages, fishing gear workshops, fish shops, etc. are in good repair, and are being used by local fishermen. The ice plants and cold storages built at Anse-la-Raye and Laborie are in good repair together with their buildings and equipment, and FMC are using both to collect catches. FMC and the Fisheries Department are planning to use these facilities and equipment to fillet flying fish.

#### Tapion:

This village is located at the tip of the southern shore on the entrance to Castries Bay. The original B/D project had called for the facilities to be constructed in Banannu, 2 kilometers farther into the bay, but at the request of the Government of St. Lucia, the site was changed over to Tapion. However, the plan to move the fishermen of Banannu to Tapion did not materialize, and the facilities have

been left unused. Last June, the fishing gear storage there was dismantled and the materials transported by the Fisheries Department for reconstruction on the fishing beach in Praslin.

**Micoud:**

Under the influence of constant winds and waves from the sea on the east coast of the island, the fishing gear storage, mainly constructed of steel, is conspicuously corroded.

Although the boat ramp originally consisted of sleepers laid on the sandy beach, an electric capstan for boat hauling, and rope-guide rollers, the sleepers are scattered, and the capstan is out of order in an advanced state of corrosion as it is left unattended. Thus except for these remains of the boat ramp, the beach looks just as it did before its construction. Essentially the same situation is seen at most other villages, too.

**Gros Islet:**

Earlier in Item 3.4, the facilities of this village is described. Because the boat ramp cannot be used, fishermen have trouble finding places to bring their boats ashore. The structures of the fishing gear workshop, fish shop, toilets and shower room are in good repair.

**2) Castries Fish Market**

This market is situated on the premises of the Castries Fisheries Complex. The location as originally planned for was adjacent to the central market of Castries City's commercial district, but failing to bring the plan into alignment with a Central Market Project, the construction site was changed over to the present location about one kilometer from the central market. Being far from the commercial district and the central market, the fish market has trouble attracting shoppers and is not the best location for a retail market, although it is bordered by the main road running through the city.

The fish market was to be publicly operated under the jurisdiction of the city hall of Castries, but because of careless administration on the part of the city hall, including failure to lock up for the night, it is now under the jurisdiction of the Ministry of Agriculture, Lands, Forestry and Fisheries.

When the fish market plan was originally made, there were some 20 fish retailers operating in the central market, and the plan called for these retailers moving to the fish market. However, the retailers do not seem to have moved as planned, the reasons including no shoppers being near the fish market and the market's fish stands not suiting the local way of fish retailing.

The fish retailers of that time are now of advanced age, and as some have closed their business or have died, the number of active ones has now declined to three or four, of which only one or two are using the fish market facilities.

Catches landed at the boat ramp of the Castries Fisheries Complex are sold directly from the fishermen to consumers on the spot.

The Castries Central Market Project is undertaken with national budgets of St. Lucia and funds from European Development Fund. Construction work is in progress, with completion scheduled for October 1994.

### 3) Dennery Fishing Port

With Japan's grant aid for 1992, the Dennery Fishing Port Project was executed, and in March 1994, it was completed.

When the basic study team conducted the field survey, it was already in the lean period, and there were no landings seen. At the wharf in the port, however, fishing boats, particularly those of FRP, of the Dennery area were moored safely, indicating that the port is being used.

The facilities in the port are operated and managed by the following organizations under the guidance of the Fisheries Department, the Ministry of Agriculture, Lands, Forestry and Fisheries:

Fishing gear storage and fuel supply station	:	Dennery Fishermen's Cooperative
Ice plant and storage	:	FMC
Fish shop	:	City hall of Dennery

## **3.8 Conditions of Project sites**

There are two Project sites:

1) Castries Fisheries Complex

Construction of refrigerating facilities for the Fisheries Complex

Construction of facilities for the Fisheries Department

2) Gros Islet landing port

Improvement and expansion of Gros Islet landing port's facilities

### **3.8.1 Castries Fisheries Complex**

(1) Overview

This Complex faces the inlet in the northern shore on Castries Bay, and is located about one kilometer from the central commercial district of Castries City.

The south edge of the Project site, facing Castries Bay, forms a fishing-boat moorage equipped with a boat ramp and a pier. The water in front of the moorage is the inlet deep into Castries Bay, well protected from winds and waves from the open sea, offering a most favorable place to moor small boats.

The east edge of the Project site is on the main road leading to the central district of the city.

On the Project site are installed the following facilities:

Marine product processing facilities and cold storage (Constructed in 1984 with CIDA's aid)

Fish market and attached facilities (Constructed in 1989 with Japan's aid)

Fishermen's fishing gear storage (Constructed by the Fisheries Department in 1994)

Boat ramp

Other fishermen's barracks

(2) Natural conditions

In St. Lucia, situated in a northeasterly trade wind region, the northeasterly wind prevails throughout the year. For this reason, the east coast of the island is exposed to the northeasterly winds and waves directly from the Atlantic. On the other hand, the west coast, on which the city of Castries is located, is downwind, and the influence of winds and waves is by far smaller. The sea conditions are relatively quiet. The water in front

of the Project site is the inlet deep into Castries Bay, and is well protected from winds hitting the bay from the open sea. Its tidal range is from 0.3 to 0.6 meter.

The average annual rainfall ranges from 3,500 to 4,000 millimeters for the mountainous region in the center of the island, and about 1,200 millimeters for coastal areas, including Castries.

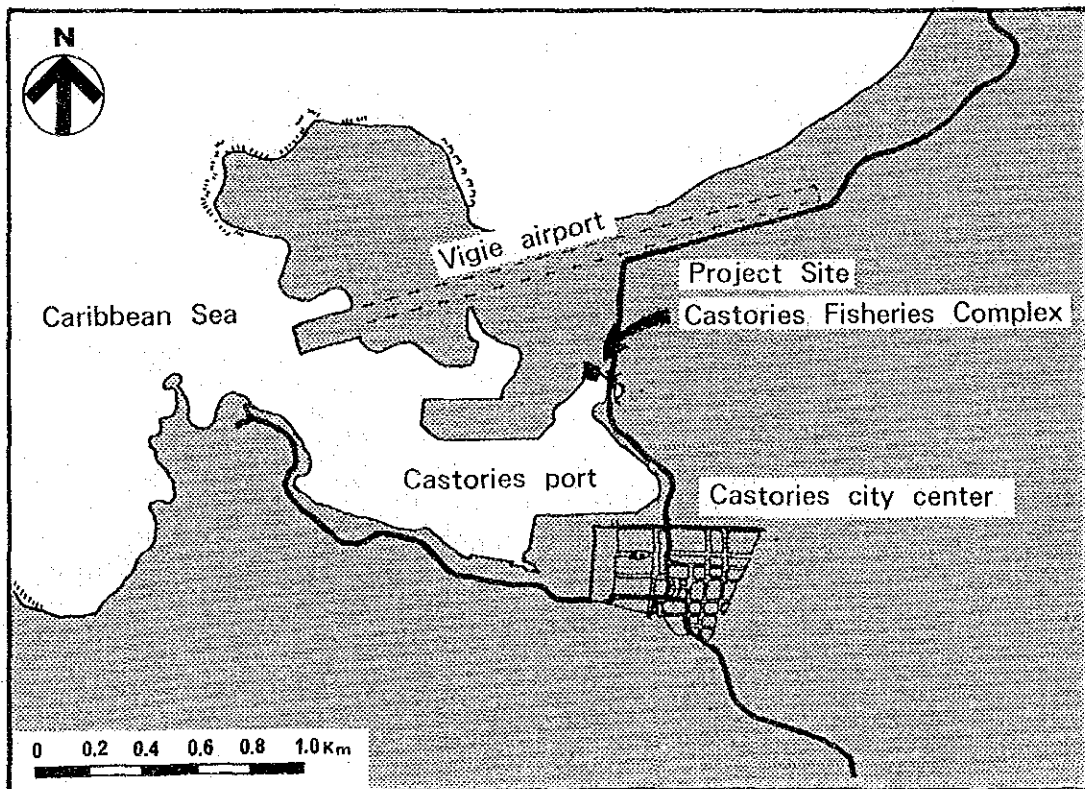
The area containing the Project site was reclaimed from a marsh in the inlet extending from Castries Bay. It is on relatively soft sedimentary ground, and signs of differential subsidence of some 50 millimeters have been seen in the existing cold storage. The ground needs to undergo ample foundation work according to the soil's bearing capacity before the construction of the facilities.

### (3) Infrastructure

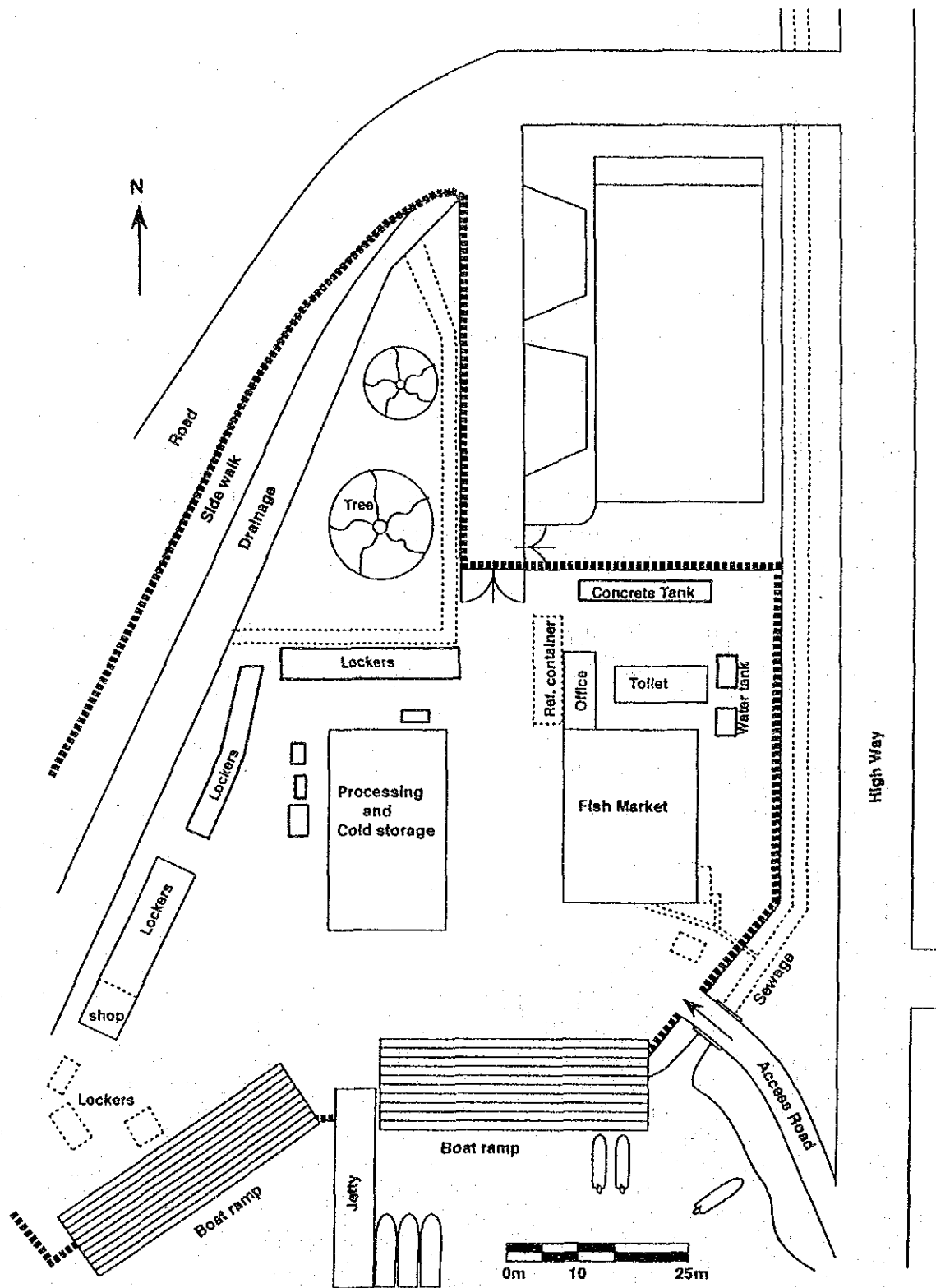
The Project site is situated in the city of Castries, the nation's capital. Refrigerating, cold storage and other facilities are already in operation on the site. Such services as road, electricity and water are well provided.

The east edge of the Project site is along the main road leading to the central district of the city. Its west edge is also along the road connecting with the main road north of the site.

Both electricity and water supplies are already provided on the site.



# CASTORIES FISHERIES COMPLEX





### 3.8.2 Gros Islet

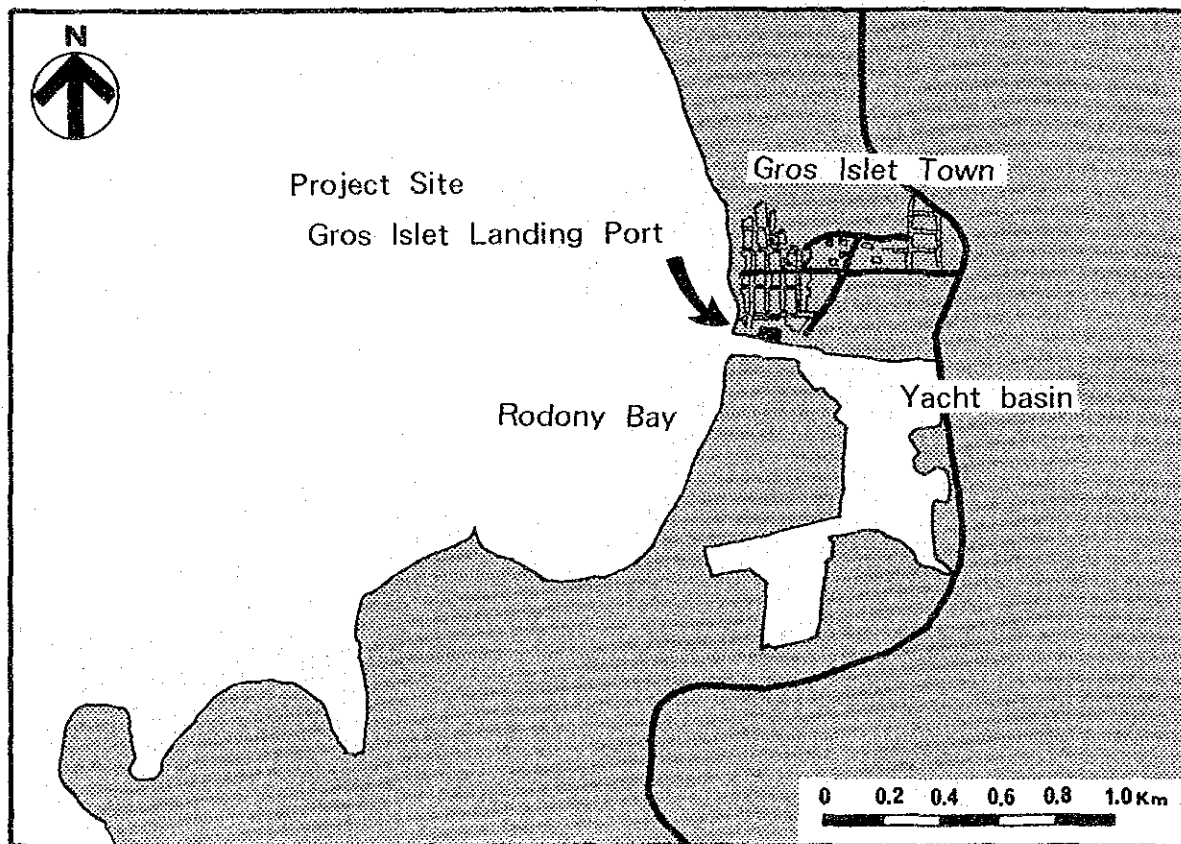
#### (1) Overview

Gros Islet is located on the west coast in the north of St. Lucia island, and faces Rodony Bay, which widely opens westward. In and around this village are hotels, restaurants, a yacht harbor and other facilities, making an area developed in the tourist industry on the island as well as the Castries area.

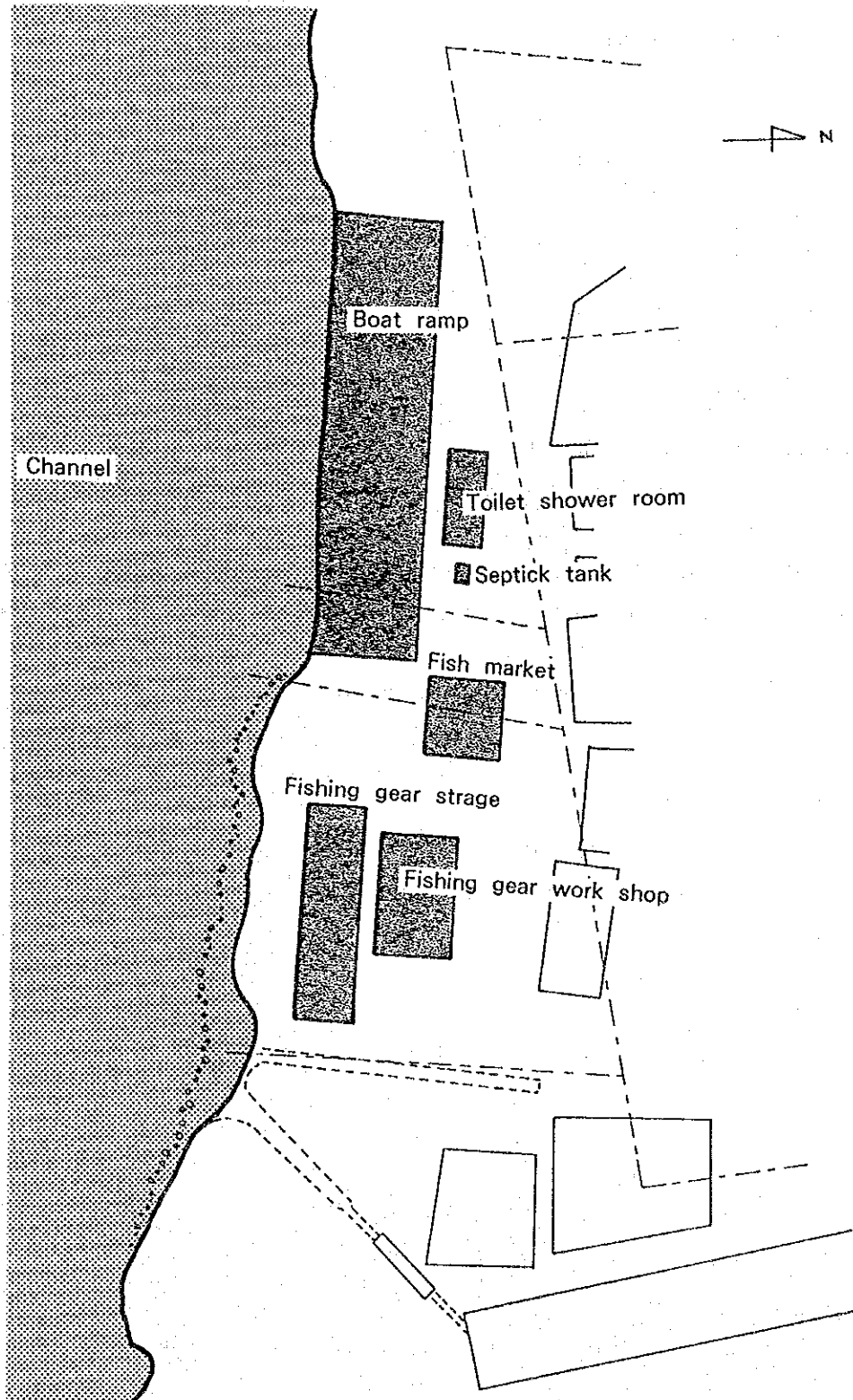
The village is situated some ten kilometers north of the capital of Castries, and the main road from Castries passes through the area.

A channel leading to the yacht harbor is located near the middle of the sandy beach on Rodony Bay. On this channel, some 60 meters wide and some 300 meters long, is the Gros Islet landing port, the Project site.

The central part of the channel (which at its deepest is approx. 3 m) is used as a passage for mainly yachts and motorboats. The part of the channel in front of the Project site, not including the passage, is an area which is required for the navigation of Gros Islet's local fishing boats, namely, outboard equipped wooden canoes and FRP boats, to reach and leave the landing port without hindering the navigation of other boats.



Gros Islet Landing Port



### **3.9 Environmental problems**

With industrial development in progress in St. Lucia, too, it has been pointed out that the natural environment is being adversely affected in various ways. The environment is an irreplaceable asset, and in its conservation, the utmost care must be exercised.

The facilities being considered under this part of the Project are refrigerating facilities on the Castries Fisheries Complex, facilities for the Fisheries Department, and the Gros Islet landing port. Although these facilities will be designed so as not to discharge particular contaminants that can cause environmental pollution during their operation, there is a need to pay attention to any deterioration in the water quality caused by drainage from the site.



## CHAPTER 4 CONTENTS OF THE PROJECT

### 4.1 Basic Concept of the Project

As pointed out in the fisheries development policy for St. Lucia, investment and restructuring are necessary in the areas of production and distribution, fisheries infrastructure and technical development and education. This Project meets the above restructuring needs by i) promoting the effective use and stable supply of fisheries products by expanding the current refrigeration facilities, ii) promoting survey, research and guidance activity by the provision of facilities, equipment and materials to the Fisheries Department, and iii) aiding local fishermen by renovating the Gros Islet fisheries facility. The Project consists of the following three components:

- 1) Expansion of facilities on Castries Fisheries Complex
- 2) Establishment of Fisheries Development Center
- 3) Improvement of Gross Islet landing port

#### (1) *Expansion of the facilities at the Castries Fisheries Complex*

The nation's fish catches are concentrated in a certain period of the year: At times of a large catch, an excess of fish occurs at landing areas, and without buyers, some of it is wasted. By contrast, during the lean period, the catch falls so that supplies for consumers decrease substantially. In these circumstances, there is a need to ensure sales outlets for the catches of the fishermen and stable supplies for the consumers by purchasing and preserving excess fish during the bumper period.

Meeting this need is the St. Lucia Fish Marketing Corporation, Ltd. (FMC), which operates from the Castries Fisheries Complex to purchase, cold-store and sell catches. However, the capacities of its existing refrigerating facilities are not large enough to purchase all of the excess catch. For this reason, there are days when fishermen have to give up going to sea in spite of being in the bumper period.

For fisheries development, it is indispensable to give fishermen an incentive to produce by ensuring them sales outlets. Expanding the operations of FMC in charge of marketing fish in the country will be effective towards achieving this purpose.

Thus the part of the Project concerned with the Complex has been designed to extend the refrigerating facilities, the bottleneck in the performance of FMC's operations, thereby

increasing its capacity to purchase catches. This will ensure sales outlets for fishermen and stable supplies for consumers.

(2) Establishment of Fisheries Development Center

For the purpose of fisheries development in Saint Lucia the following topics must be addressed:

For the nation's fisheries development, the following needs must be satisfied:

Modernization of productive means (Development, introduction and guidance of new fishing boats, gear and methods)

Availability of basic statistics (Collection of numerical and other data on fish catches, the number of fishing boats and the management of fishing operations)

Conduct of fishery surveys (Analysis of resources for quantities, development of new fishing grounds, development of marine products, and development of aquaculture)

Educational activities for fishermen (Consultations with fishermen for the protection of the ecosystem, holding of safety training sessions, and guidance in the value enhancement of fish catch)

However, because a base, equipment and materials necessary for these specific activities are not fully provided, the Fisheries Department is now obliged to use one room within the Department, or when a need arises to hold a training session, for example, to rent a place somewhere within the city.

As environmental conservation has been taken up as one of the nation's important policy goals, the Fisheries Department also needs to monitor the environmental conditions of the coastal waters, work out, implement, manage and otherwise deal with measures for environmental protection, in light of not only the protection of marine resources, but also of the conservation of the marine environment.

In order to deal with this situation, the Department needs to conduct and strengthen its research, instructional and other activities with required facilities, equipment and materials fully provided. As the base for such activities, the Fisheries Development Center with the following functions will be established:

(a) Research:

Collection and analysis of data on fisheries, and preparation and management of statistics

Assessment and management of marine resources through analysis of fisheries data and survey of fishing grounds

Survey of the marine environment, and its conservation and management

Monitoring of fisheries

Basic research

Basic research on the development of marine products, and inspection of their quality

(b) Spread of and guidance in fishing techniques:

Experimental fishing to develop new fishing gear and methods, to find new fishing grounds, and to spread and guide in these techniques and grounds

Various educational and instructional activities for fishermen and those concerned with fisheries

Technical guidance in the maintenance and repair of fishing-boat engines

The following equipment and materials necessary for the above-mentioned activities will be introduced:

(a) Exploratory fishing boat, and fishing equipment and materials

(b) Fishing boats, equipment and materials for use in spreading fishing techniques among fishermen

(c) Equipment and materials for the Fisheries Development Center and the Workshop

Equipment and materials for data processing/management, equipment and materials for the laboratory and the workshop, radio equipment, project car, etc.

(3) Expansion of the Gros Islet landing port

This intends to improve and expand the existing fisheries facilities at the Gros Islet landing port as a part of effort to improve local fishing villages.

In the present boat ramp, fish landing is difficult to carry out because of the ramp's erosion. Therefore, most fishermen use the sandy beach facing Rodony Bay to bring their wooden canoes ashore, while some operate from a temporary landing situated further into the waterway leading to the yacht harbor from the Project site.

Gros Islet's coastal area being used by the local fishermen is planned for tourist development. Also, the temporary landing place is situated within private land, and therefore cannot be developed as a permanent one.

In dealing with this situation, it is necessary to improve the landing port facilities for easier use, thereby ensuring the local fishermen their operating base.

Located within the channel, the landing port is free from direct action of waves from the open sea. As such, it is a safe fishing boat yard in times of stormy seas. The local fishermen, and moreover the fisherman's cooperative, would like to see this facility become useable. When the facilities in the port become easier to use, they will help local fishermen in Gros Islet. Thus it has been decided to improve the existing facilities of the landing port under the Project.

All the three components of the Project are realistic ones in terms of the situation in St. Lucia and its current technological levels. These three components are also required in various activities including fish distribution, guidance in fishing techniques, and assistance for fishermen which are conducted by the country in order to meet the national goal of fisheries development and promotion. Moreover, the Project implementation body is experienced enough in similar projects to implement the Project.

Given these facts, the Project's benefits and feasibility, and St. Lucia's capability to implement the Project have been confirmed. Moreover, the benefits which will result from the Project are in line with the purpose of the Japanese grant aid system. Judging from this, the Project's implementation as a grant aid project of the Government of Japan is deemed appropriate. Thus, assuming that the Project will be carried out as a Japanese grant aid project, in the following part of this report the basic study team will describe the outline of the Project and its basic design.

## **4.2 Objectives of the Project**

As mentioned in Item 4.1, with the final objective of fisheries development in St. Lucia, the Project consists of the three components; i) the expansion of the facilities on the Castries Fisheries Complex, ii) the establishment of the Fisheries Development Center, and iii) the



improvement of the facilities on the Gros Islet landing port. The specific objective of each component is as follows:

(1) Expansion of the facilities on the Castries Fisheries Complex for FMC

Although catches are concentrated in a certain period of the year, the fish storage and distribution means are still underdeveloped. In particular, fish cold storage capacity is small, making it difficult to make the most of the catches, and also forming a factor behind limited fish production. In order to improve this situation, refrigerating facilities will be built to increase FMC's cold storage capacity. The larger capacity will then lead to a greater amount of the amount of the catch (excess fish) being purchased from fishermen to help stabilize supplies to consumer markets.

(2) Establishment of the Fisheries Development Center

The Fisheries Department's research and instructional activities are constrained due to lack of proper facilities, equipment and materials. In order to improve this situation, the Fisheries Development Center will be built as the base for the Department's activities, and necessary equipment and materials will be provided. This will help the Department increase and enhance its activities.

(3) Improvement of the Gros Islet landing port

In order to improve this situation, the facility will be improved, including renovations to existing facilities. This will ensure local fishermen a base for their operations and assist them in their activities.

### **4.3 Project Implementation System**

The Project's implementing body is the Fisheries Department within the Ministry of Agriculture, Lands, Forestry and Fisheries. Under the Department's supervision and guidance, the following working organizations will directly manage and operate the facilities, equipment and materials in their charge.

Fisheries Department	:	Fisheries Development Center
St. Lucia Fish Marketing Corporation. Ltd.	:	Refrigerating facilities
Gros Islet Fishermen's Cooperative	:	Gross Islet landing port

### **4.3.1 Fisheries Development Center**

#### **(1) Organization and personnel**

The administrative and research / education sectors of the Fisheries Department shall be divided and the latter shall be set up in the new Fisheries Development Center which will be directly managed by the Department.

The Center will be for the personnel of the Department to conduct their research and instructional activities. The Fisheries Development Center will not be a new organization outside the Department, and, save future new recruits, no new personnel will be added. The Center will be operated by department employees in charge of research and instructional activities in the following sections.

##### **Data Management and Resource Assessment:**

Will collect, organize and analyze various fisheries data, and prepare and manage statistical material; will assess fishing-place survey findings and marine resources, and prepare basic material for use in fisheries management. There will be five personnel.

##### **Conservation and Management:**

Will survey and monitor the coastal marine environment by fixed point observation, visual inspection through diving and other methods; will also prepare basic material for use in preparing environmental conservation measures and policies; and guide fishermen, travel agents and others concerned in cooperation with the Data Management and Resource Assessment Section. There will be two personnel.

##### **Aquaculture:**

Will conduct basic researches on aquaculture, manage aquacultural development projects, and analyze and organize data. There will be three personnel.

##### **Product Development:**

Will conduct basic researches on fish processing and product development. Personnel will be one food scientist.

##### **Extension Section:**

Will educate and guide fishermen and those concerned with fisheries. Will also guide in and spread methods of fishing, and engine repair and maintenance in

cooperation with the Fishing Development Section. Personnel will be comprised of six members.

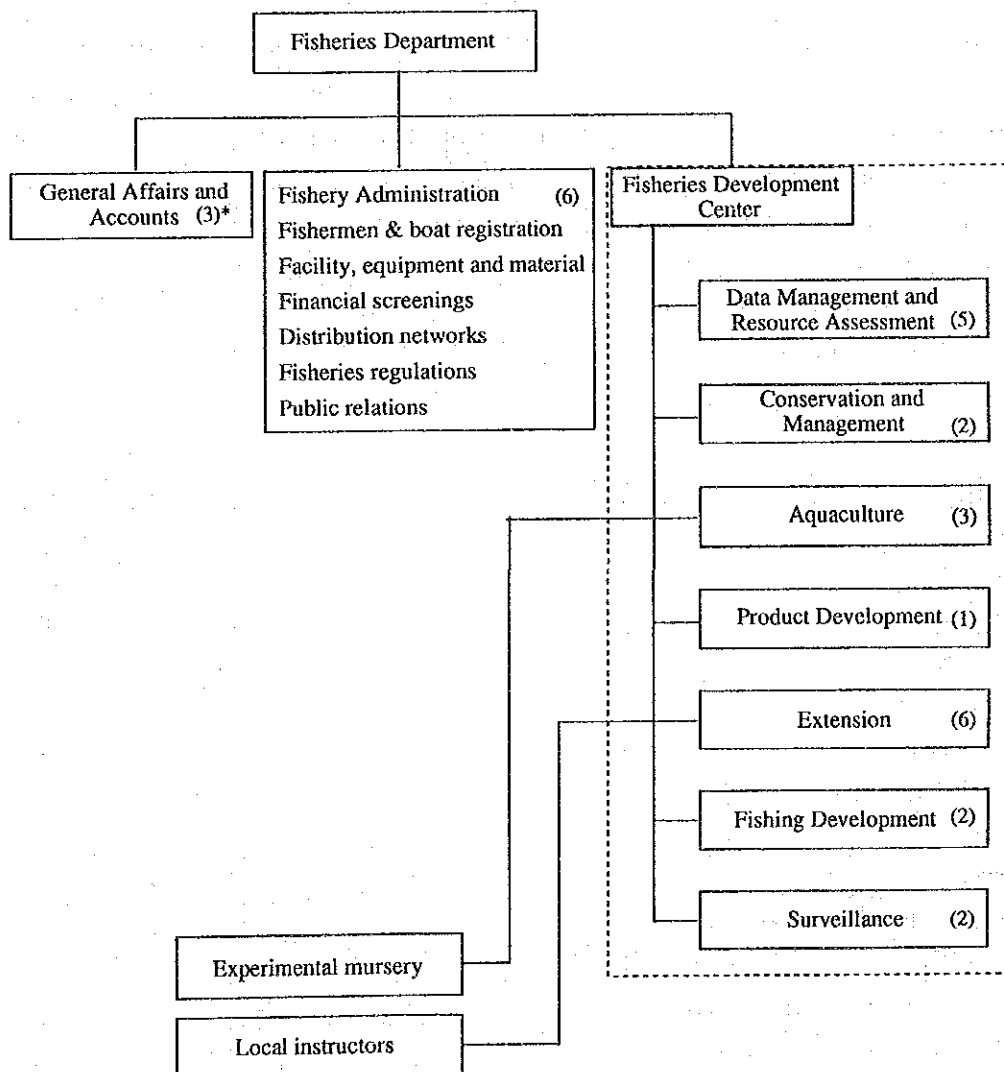
**Fishing Development:**

Will develop new fishing gear and methods through fishing-gear preparation and experimental fishing in cooperation with the Extension Section. There will be two personnel.

**Surveillance:**

Will survey and give guidance in fishing operations and the implementation of fisheries regulations. There will be two personnel.

**Organization of the Fisheries Development Center**



\* note number of personnel in brackets

(2) Budgets

The Fisheries Department's budget has grown nearly 15% on an annual basis, as shown below:

Fiscal year		
1992/93	914,382 EC dollars	
1993/94	1,051,301 EC dollars	14.9%
1994/95	1,206,358 EC dollars	14.7%

For fiscal year 1994/95, 600,334 EC dollars have been approved as expenditures on various development programs to be carried out by the Department. For fiscal year 1995/96, the expenditures are planned at 2,404,464 EC dollars, including external financial aids.

As noted above, the Fisheries Development Center will be the base for the personnel of the Fisheries Department in conducting their activities using the facilities and equipment provided in the Center, and no particular personnel increase is planned. Thus, the opening of the Center will not increase the Department's operating expenses, and the Center's operation will be well financed by the Department's budgets.

The Center's largest expense item is the cost of operating the exploratory fishing boat. Including this item, its operating expenses will certainly be within its budget, as shown in the APPENDIX section at the end of this report.

Fiscal year	1992/93	1993/94	1994/95	1995/96 Estimate
Budget	914	1,051	1,206	1,618
Expenses	914	1,051	1,206	1,267
Personnel expenses	402	497	576	604
Travel, subsistence	88	104	134	141
Office expenses	5	6	6	60
Supplies/materials	40	31	37	38
Operating/Training	79	66	70	73
Subsidies	259	257	315	331
Insurance	41	90	69	72
Expenses for the Center/Equipment				85
Electricity/water expenses for the Center				10
Operation cost of the project car				162
Operation cost of the exploratory fishing boat				94
Operation cost of the small experimental fishing boat				

Total expenses for the year 1995/96	1,618
Revenue by sale of fish caught in experimental fishing operation	
by the exploratory fishing boat	1156
by the small experimental fishing boat	96
Total revenue	252

(Unit: 1,000EC\$)

(The details of FMC's operating budget including the Project facilities are included in the Appendices.)

### (3) Maintenance and management

The Fisheries Development Center will be maintained and managed by the Fisheries Department as its facilities on its budget. The Center will be provided with no special equipment that require special maintenance techniques. All equipment and materials, except the FRP boats for fishermen, will be owned by the Fisheries Department and operated and maintained by the Fisheries Development Center. Direct management of these equipment and materials will be provided by the Department's staff who will operate them.

The exploratory fishing boat will be based in Castries (the Fisheries Complex's fishing boat jetty) for direct operation and management by instructors in fishing gear and methods from the Fisheries Department (the Fisheries Development Center).

The FRP boats for fishermen will be distributed to the fishermen to be selected by the Fisheries Department after it provides technical guidance to them. The Department will guide the fishermen in the operation of the boats after the distribution as well.

## **4.3.2 Castries Fisheries Complex**

### (1) Organization and personnel

The refrigerating facilities under the Project will be operated and managed directly by the St. Lucia Fish Marketing Corporation, Ltd. under the Fisheries Department's supervision and guidance. FMC's organization and personnel are as mentioned in Item 3.6.1, Chapter 3.

The refrigerating facilities will be run and maintained basically by FMC's present personnel, except several fish collectors and processors (part-time) to be added for increased fish purchase.

## (2) Budget

In spite of being a publicly-run organization, FMC is under a self-supporting accounting system. For a few years from the start of its operation, it was subsidized in the form of capital subscriptions by the Government of St. Lucia and the National Development Corporation (NDC), but since 1990, it has had no subsidies; its financial conditions have turned favorable due to growth in its operations.

The FMC's budget is as follows including the operating costs of the Project facilities and increased general administration costs. There are no budgetary problems for the FMC in operating the Project facilities.

Below are the expenditure and budget of the Fisheries Department including the expenses for the Project.

Actual records	Items	Estimate including the planned facilities	Remarks
6,216	Sales	7,624	Approx., 100 tons is increased in sales. Sales of imported products is kept at present level.
4,977	Purchase (a)	5,804	Approx. 100 ton is increased in purchase. Import of fish products is kept at present level.
979	Production Cost (b)	1,306	327,000EC\$ is increased of r operation and maintenance of the planned facilities.
5,956	Cost of sales (a + b)	7,110	
260	Gross profit	514	
450	Operating expenses	450	Operating expenses is not to be changed
-180	Operating income	64	

(Unit: 1,000EC\$)

## (3) Maintenance and management

The facilities under the Project will be maintained and managed directly by FMC. FMC has a plant maintenance department staffed with technicians, who maintain and manage the facilities on the Fisheries Complex, including the fish processing and cold storage.

The facilities will also be maintained and managed by FMC as its facilities on its own expenses.

### 4.3.3 Gros Islet landing port

#### (1) Organization and personnel

The Gros Islet landing port is managed by the Gros Islet Fishermen's Cooperative under the Fisheries Department's supervision and guidance. The Cooperative consists of 37

members (all of them full-time fishermen), with five officers, including the chairman. These officers are volunteers, without any remuneration received from the Cooperative.

(2) Management of the facilities

The facilities under the Project will be managed by the Cooperative in accordance with the regulations for use of the facilities which a facilities management committee to be formed in the Cooperative will adopt.

The facilities will incur no particular operating expenses, except those for water and lighting. These operating expenses will be paid out of facilities use fees collected from the fishermen on the user payment principle. This fee must be fixed in an amount that will not be too much for the fishermen, and the facilities management committee and the fishermen will consult each other to fix the amount. In addition, part of the sales commissions for fuels handled by the committee will also be used to pay the facilities operating expenses. Their percentage will also be fixed in consultation between the Cooperative and the fishermen by reference to the corresponding figures charged by other cooperatives.

An estimate is shown below on expenses / revenue of the facilities, as a reference.

Expenses		
Electricity	$500\text{whr} \times 5\text{h/day} \times 300\text{ days/year} \times 0.78\text{EC\$/kwhr}$	= 585EC\$/year
Water	$1.5\text{m}^3/\text{day} \times 300\text{days/year} \times 1.20\text{EC\$/m}^3$	= 540EC\$/year
Wages for person in charge of management of the facilities and gas stand	@ 850EC\$/year	= 10,200EC\$/year
<hr/>		Total 11,325EC\$/year
Revenue		
Rent of boat ramp	$50\text{EC\$/boat/year} \times 30\text{ boats}$	=1,500EC\$/year
Rent of fishing gear storage	$100\text{EC\$/room/year} \times 16\text{ rooms}$	=1,600EC\$/year
Charges for selling fuel oil	$30\text{l/boat} \times 20\text{ boats/day} \times 24\text{ days/month} \times 12\text{ months/year}$	= 172,800 l/year
	Charges 0.05EC\$/l $\times 172,800\text{ l/year}$	= 8,640EC\$/year
<hr/>		Total 11,740EC\$/year

The balance of 415EC\$/year (11,740 – 11,325) is to be managed by the Cooperative for maintenance of the facilities.

## **4.4 Basic Design**

### **4.4.1 Design Principles**

In the basic design under the Project, the current situation in St. Lucia will be taken into full consideration. Also, consideration will be given to the following three items so that the Project will be carried out within the scope of the Government of Japan's financial grant aid, to provide the facilities, equipment and materials that will best meet the needs on the basis of which the Government of St. Lucia made the request for cooperation:

(1) Design fully considering natural conditions

Castries and Gros Islet are both situated down the northeasterly trade wind, and usually enjoy moderate climate conditions, although they are sometimes hit by hurricanes. In view of these conditions, the facilities under the Project will be of sufficient strength and construction.

Being built on the coastal areas, the facilities, particularly those on Gros Islet, facing the waterway and near the open sea, will be directly influenced by salty breezes. In consideration of possible salt damage, anti-corrosion materials will be employed.

In consideration of the fact that the Castries Fisheries Complex's ground was reclaimed from a marsh, the foundations of the facilities will be of sufficient strength.

(2) Design considering social conditions

St. Lucia has long been under the influence of Britain, with many social institutions introduced from it. Regulations and standards concerning construction, transportation, disaster prevention, etc. are also based on British ones.

(3) Construction method and supervision befitting the local construction industry

The implementation of development projects and the construction of facilities are all under the supervision of the Ministry of Planning, and the design of facilities needs to be screened in advance and certified by the Ministry. For this certification, the relevant development project and the design of its facilities must conform to the regulations for the planning of facilities laid down by the Ministry. Therefore, construction operations



under the Project will be undertaken with contact and confirmation with the Ministry of Planning, as well as the Project implementing body.

Judging from the fact that the existing local hotels and governmental facilities and buildings are high in construction quality, local construction companies will be able to construct sound facilities with the Japanese grant aid if the construction specification is appropriate and work supervised appropriately. There are several such local construction companies. Assuming that a few good construction companies will be selected, guidance given in specifications and construction accuracies for sure compliance, and on-site supervision provided in regard to progress, etc., company selection and construction work principles will be worked out so that the facilities will be completed within the date specified for the Project as an grant aid project.

The facilities in the Project will be designed so that they can be constructed by common methods available in St. Lucia. For this reason, in consideration of local constructors' experiences, the construction periods they require, and the like, the refrigerating facilities will be thermally insulated with prefabricated insulation panels, which are relatively easily installed and not with other insulation types which may be difficult to construct on site.

#### **4.4.2 Examination of Design Conditions**

##### **(1) Basic Principles**

Facilities and equipment will be designed and constructed in accordance with the following standards and regulations specified by the Government of St. Lucia:

Facilities Planning Standard laid down by the Ministry of Planning, St. Lucia

(???)

The basic principles concerning facilities and equipment are as follows:

##### **1) Refrigerating facilities**

These facilities will be constructed to increase the operating capacity of the Castries Fisheries Complex's existing freezer and cold storage facility, which is operated and managed by FMC. Concerning the facilities, the conditions given below will be met.

The planned facilities will be laid out so as to meet these conditions:

- To ensure a smooth flow of people and cars for efficient fish processing operations, with the relative position with the existing facilities in mind
- To avoid as much as possible moving or dismantling existing facilities

The structures of the freezer room and the cold storage will be insulated with prefabricated insulation panels. Local constructors have had no experience in constructing insulated refrigerating facilities, making this kind of construction difficult. In contrast, prefabricated insulation panels will be easy to installed for local constructors, and they are also advantageous in terms of having a shorter construction period. These are the reasons for having selected prefabricated insulation panels. Furthermore, the existing refrigerating facilities are also insulated with the same type of panels.

The freezer room and the cold storage will be divided into two or three compartments each so that the operation of the refrigerator can be adjusted according to the fish purchase quantity and stock level.

The current refrigerating capacity is small, and any large arrival is slowly refrigerated in the cold storage; this kind of operation should be avoided in order to preserve good administration of the storage and fish quality. In order to facilitate freezing operations and to improve fish quality, sufficient refrigerating capacity will be provided.

In addition, the volume of the cold storage is too small to offer enough working space inside, and this makes it impossible to sort out fish by species and stow away. It is also difficult to take ordered fish out of the cold storage and to perform other operations efficiently, including stock control and shipment. In order to improve this situation, the cold storage will be provided with sufficient working space.

The freezer equipment will be one that is operable and maintainable by FMC with its experience and technical level.

#### Renovation of part of the fish market

It is necessary to increase the counter space, office space and fish processing space at the fish market to accommodate the increase in frozen fish sales which is certain to happen when the freezing and refrigerating facilities in this project are built. For this purpose, one part of the existing frozen and fresh fish sales counters will be replaced

by a new expanded frozen fish sales counter, processing space and office. The removal of the existing counters will be conducted by the St. Lucia side.

Space for the sales of fresh fish will be reduced in this renovation, however, this will not hinder fresh fish sales as there is a fresh fish market planned as a part of the new large scale market currently being constructed in the city.

The renovation principles are:

The existing fish market's structure and roof will be used as is as much as possible.

Part of the fish stands in the present market will be removed, and the following facilities and equipment will be installed on the vacated space:

A retail shop specialized in frozen fish; a station to cut and package frozen fish for retail sale; an office; and retailer's equipment consisting of band-saw, vacuum packer, balance and frozen products case

Furthermore, with the establishment of this frozen fish retail shop, fish will be available to any one at anytime, greatly improving the convenience of the fish market for the consumer.

## 2) Fisheries Development Center

Facilities and equipment necessary for the Fisheries Department's research and instructional activities will be provided to form its base. In addition, research and working spaces will be provided for the Department's personnel.

The following main facilities will be provided for the Center:

### General Affairs Room:

The Center's general affairs will be handled here. The director's and deputy director's offices of the Center will be included.

### Working Room for Researchers/Staff:

Will be used by each research section.

### Meeting Room:

Will be used for training sessions for fishermen, Cooperative's members, etc., for meetings of the Center's personnel, and for other purposes.

**Laboratory:**

Will be used for basic experiments relating to marine environmental studies, aquacultural development, etc. and for developmental experiments, the analysis of quality, etc. relating to processed fish.

**Diving Survey and Equipment Room:**

Will be used to store, repair and prepare equipment necessary for field surveys by diving in the study of fishing places, resources, and marine environment. Will be comprised of an equipment storage room, repair and preparation room, and compressor room.

**Working Room for Extension Officers/Surveillants:**

Will be used to make plans for giving fishermen guidance in fishing techniques and spreading those techniques among them; to make preparations for preparing reference material; to design and fabricate fishing gear; to make experimental fishing plans and organize experimental results; and to prepare plans for fisheries surveys and surveillance; to make preparations for surveys; and to prepare reference material.

**Storage:**

Will be used to store equipment and materials needed to develop fishing gear and methods and spread these techniques among fishermen.

**Workshop:**

Will include equipment needed to guide in techniques of repairing and maintaining fishing-boat engines; a repair compartment, and a tool and equipment storage.

**3) Gros Islet landing port**

- a) The work, centered around the renovation of the existing facilities, will consist of building and expanding the facilities. Introduction of mechanized equipment will be avoided as much as possible and the facilities made as durable and as inexpensive to run and manage as possible. The main kinds of work will include:

#### Renovation of boat ramp:

The boat ramp's front part and slope will be finished to an even concrete surface so that a boat can be brought.

#### Construction of landing wharf:

A landing wharf will be built in front of the fishing gear storage so that such operations as catch landing, fishing-gear loading and unloading and refueling of FRP fishing boats, which have been introduced in recent years, can be done both safely and easily.

#### Reconstruction of fishing gear storage:

The existing storage, of steel and markedly corroded, will be reconstructed in the present size at the present location.

#### Installation of fuel supply station:

Fishermen now have no choice but to go by bus or taxi to a filling station, some one kilometer away, to their inconvenience. In cooperation with the St. Lucia side (to procure and install a filling pump and guarantee a supply of fuel), a fuel supply station will be built within the existing facilities of the landing port for the fishermen's convenience.

#### Construction of access roads:

Roads will be built between the facilities' premises and nearby roads to facilitate traffic for not only fishermen but also the general public (who come to shop for fish).

- b) The facilities under this part of the Project will be designed so as not to hinder ships (mainly yachts and leisure boats) sailing through the waterway in front of the landing port.
- c) The landing port will be redesigned in line with Gros Islet's present fisheries levels and scale, namely, to accommodate a total of 30 or so wooden canoes and FRP boats, both equipped with outboard engines.

(2) Setting the scale of the planned facilities

1) Expansion of the facilities on the Castries Fisheries Complex

a) Refrigerating facilities

On the basis of FMC's purchase records and an estimate of future annual national catch, FMC' purchase goal will be set, and accordingly the necessary cold storage and freezer capacities set.

FMC's purchase records: 250 tons/year

Rate of this figure to 1,000 tons in current annual national catch = 25%

Setting for the future catch: 1,200 tons/year

As mentioned in chapter 3, item 3.2 【\*\*check this: could be 3.1】, the annual catch for the 1987 to 1993 period increased by more than 20% every year, and in recent years, the annual catch has ranged from 960 to 1,110 tons. As continued progress is made in productive means such as fishing boats, gear and methods, the catch is expected to increase as before. In addition, although the number of days when fishermen go fishing is now restricted, once FMC expands its refrigeration capacity to purchase all the excess fish from the fishermen without any restrictions, this greater incentive to produce on part of the fishermen combined with the increase in productive means will increase the catch by some 100 tons. This increase also needs to be taken into account. Thus, the annual catch to be realized through the improvement in the productive means following the start of operation of the facilities and equipment under the Project has been set at 1,200 tons. This catch estimate may be considered realistic.

Ratio between seasons concerning the catch estimate of 1,200 tons/year

It will be assumed that this ratio is the same as before (bumper period 70% and lean period 30%).

In the January/June period, 70% or 840 tons will be landed .....(1)

In the July/December period, 30% or 360 tons will be landed .....(2)

FMC's purchase goal: 360 tons/year

FMC's share will be increased to 30%, and its purchase goal set at 360 tons/year.

In the January/June period, 90% or 324 tons will be purchased .....(3)

In the July/December period, 10% or 36 tons will be purchased .....(4)

Cold storage capacity required to increase by

It will be assumed that FMC's sales for the January to June period is the same as before.

FMC's January/June sales	=	20 tons/month × 6 months	
	=	120 tons	.....(5)
FMC's January/June purchase	=	324 tons	.....(3)
Domestic stock at end of June (3) – (5)	=	204 tons	.....(6)

It will be assumed that sales and stock of imported fish remain unchanged from before.

Imported-fish stock at end of June	=	7 tons	.....(7)
Cold storage capacity required to increase by	=	(6)–(existing cold storage capacity 112 tons – (7))	
	=	99 tons	
	÷	100 tons	

Freezer capacity required to increase by: 2.7 tons/day

The average catch in the bumper period ranges from 3.5 to 7.7 tons/day. In order to deal with this catch plus an increase expected in the future by purchasing excess fish at times of large catch for refrigeration, FMC's past operational records indicate that the same refrigerating capacity as that of the existing freezer needs to be added.

If the purchase goal is met at the annual catch level of 1,200 tons, the domestically produced fish will be supplied in the quantities indicated below.

Future catch = 1,200 tons/year

It is assumed that the catch ratio between the seasons will be the same as before (bumper period 70% and lean period 30%) and that the catch for each month will increase by 20%.

70% caught between January and June, or 840 tons .....(1)

The remaining 30% caught between July and December, or 360 tons .....(2)

Supplies to domestic markets, including shipments from FMC

Supplies from January to June = (1)-(3)+(5) = 636 tons

Average monthly supply for January/June = 106 tons/month  
(99 tons/month at present)

Supplies from July to December = (6) + (2) = 564 tons

Average monthly supply for July/December = 94 tons/month  
(67.5 tons/month at present)

Thus the future supplies for the lean period are expected to reach nearly the levels for the present bumper period.

Per capita average annual consumption of fish is still very small at 8.7 kg, so that there is ample room for further consumption if production and supplies are increased.

## 2) Fisheries Development Center

As the base for the Fisheries Department's research activities, the Fisheries Development Center will be provided with the main equipment indicated below.

### Working Room for Researchers/Staff:

For use in researching, organizing data, preparing reports and performing other operations, the following spaces will be provided:

Data Management = For 3 personnel

Resources Assessment = For 2 personnel

Conservation and Management = For 2 personnel

Aquaculture = For 3 personnel

Product Development = For 1 personnel

The total number of personnel (11) × 10 square meters/person =  
approx. 110 square meters

### Meeting Room:

Will be used for meetings of the Center's personnel and for training sessions for fishermen and the Cooperative's members

Capacity = 30 persons × 3 square meters/person = approx. 90 square meters



**General Affairs Room:**

Will provide offices for general affairs personnel, secretaries, and the Center's director and deputy director:

For general affairs personnel and secretaries =  
4 persons × 8 square meters/person = approx. 32 square meters

For director, deputy director and experts =  
3 offices, totaling approx. 48 square meters

**Laboratory:**

Will be used to conduct basic experiments, and food analyses and inspections, for the development of processed fish food, and basic experiments and research for marine environmental research and aquacultural development

= 57 square meters

**Diving Equipment Room:**

Will be used to store, repair and prepare equipment needed to conduct research by diving, including target survey and sampling on the site, in the survey of fishing places, resources and the marine environment. Will provide the following equipment storage/ preparation and compressor rooms:

Equipment storage/preparation room = approx. 38 square meters

Compressor room = approx. 16 square meters

**Working Room for Extension Officers/Surveillants:**

Will be used to make plans for developing and researching fishing boats, gear and methods, plans for spreading and guiding in these techniques, and plans for fisheries survey and surveillance, and preparations for these surveys and the preparation of reference material.

8 persons × 8 to 9 square meters/person = approx. 68 square meters

**Storage:**

Will store equipment and materials needed to develop fishing gear and methods, and to spread these techniques.

With floor area similar to that of existing rented storage =  
approx. 90 square meters

### Workshop:

Will provide facilities and equipment for use in guiding fishermen in the maintenance and repair of fishing-boat engines.

Equipment repair compartment and tools and materials storage =  
approx. 70 square meters

### 3) Gros Islet landing port

#### a) Boat ramp

It is assumed that the existing local wooden canoes will be entirely replaced by FRP boats in the future. The ramp's capacity will be set enough to accommodate 50% of the current local fishing boats.

$$\text{Number of boats} = \text{local fishing boats} \times 50\% = 15$$

Assuming that the width of a FRP fishing boat is about 2.0 meters and the space needed to bring each boat ashore is about 1 meter wide, the ramp's width will be as follows:

$$\text{Boat ramp's width} = (\text{width of a boat} + \text{space need to bring ashore each ship}) \times \text{number of boats} = (2 \text{ meters} + 1 \text{ meter}) \times 15 \text{ boats} = 45 \text{ meters}$$

#### Boat ramp's depth:

It is assumed that with the draft of a FRP boat in mind, the water in front of the boat ramp will be made about 0.7 meter in depth, measured at low tide, and that a space of 9 meters in length will be set aside for putting boats on the ramp, the depth of the ramp will be made 16 meters.

#### b) Landing wharf

It is assumed that the operating rate of the local fishing boats will be two thirds of the total, or about 20 boats a day. Assuming further that these fishing boats will use the wharf as mentioned below to prepare for fishing, to load and unload fishing gear, to land catch, and to do other operations, the effective wharf length will be made 30 meters.

#### Berth turnover rate

$$\begin{aligned} &= \frac{\text{working hours of boats at berth before and after going out fishing}}{\text{working hours of a single boat at berth}} \\ &= 3 \text{ hours} / 30 \text{ minutes} \\ &= 6 \text{ boats/berth} \end{aligned}$$

Effective landing wharf length

= (number of boats / berth turnover rate) × (boat length + spacing between boats)

= 20 boats / 6 boats / berth × (9 meters + 1 meter)

= approx. 30 meters

c) Fuel supply station

A fuel tank with the following capacity will be installed underground:

Tank capacity

= consumption/boat/day × 20 boats/day × number of refuelings/week

= 30 liters/boat/day × 20 boats × 6 days/week

= approx. 4,200 liters

The supply pump will be purchased and installed by the St. Lucia side in cooperation with a local fuel supply company.

(3) Principles concerning the provision of equipment and materials

1) Equipment and materials for the Fisheries Development Center

The following equipment and materials will be introduced for direct operation by the Fisheries Development Center under the Fisheries Department in conducting research activities, guiding fishermen in fishing techniques, spreading such techniques among the fishermen, and attaining other purposes:

a) Exploratory fishing boat

With regard to productive means for fisheries development in St. Lucia, there are needs to introduce modern fishing boats, to develop and spread new fishing gear, methods and grounds, and to give guidance in those techniques. These needs are particularly felt in the development of a fishery for large pelagic fish like tuna. Moreover, there are needs to exercise surveillance over fishing operations, assess marine resources, and giving guidance in coastal marine environment monitoring for environmental conservation. However, these needs are not yet fully met because the Department's existing exploratory fishing boat is not mobile enough and is lacking in living equipment, fishing and other gear. In order to take the place of the existing boat in performing the operations required of the Department, another exploratory boat will be introduced. The new boat will be owned by the Department and directly operated by the Fisheries Development Center.

The boat will be operated with the necessary equipment on board to achieve the following main objectives:

- To conduct experimental fishing operations, especially tuna longline fishing and vertical line fishing, and to survey and develop offshore fishing grounds.
- To survey the marine environment
- To guide fishermen in fishing techniques

The boat will be equipped to accommodate a total of five on a 2 to 3 day voyage: In addition to the two operating personnel, staff for the development of fishing gear and methods, for surveys and/or for other purposes will be on board.

b) Small experimental fishing boat

This boat will be introduced for use in modernizing fishing boats, developing new fishing gear, methods, and grounds, spreading them among fishermen, and providing related technical guidance. It will be also owned by the Fisheries Department, and operated by the Fisheries Development Center, as is the exploratory fishing boat mentioned in the preceding item.

Steady progress is being made in the motorization of fishing boats with outboard engines and in the introduction and spread of new types of boats, all toward the goal of modernization of the nation's existing fishing boats. As one of its goals for the next term, the Fishing Department has set the introduction and spread of fishing boats with inboard diesel engines of long service life in place of short-lived outboard engines. In order to meet this goal, the Department has decided to introduce a fishing boat with inboard engine on a trial basis, for the purpose of experimental fishing operations, demonstrations and for use in technical guidance of the fishermen.

The small experimental fishing boat will also serve as the model for a fishing boat equipped with an internal engine to be adopted in the next term.

The experimental boat will be made as small-sized as possible to make its introduction among fishermen easier in the future. It will be equipped with the type of longline fishing gear that is to be further developed for the purpose of spreading it among the nation's fishermen.

c) FRP boat for fishermen

This is a FRP boat with outboard engine that will be introduced to spread modern fishing boats among fishermen. It is basically the same as those boats introduced by the Fisheries Department under the previous projects for spread among fishermen. The Department has decided to take a further step toward alleviating the work of the fishermen and making more efficient fishing operations through the provision of appropriate fishing gear. As an experimental boat in pursuit of this goal, this type of boat will be introduced with a longline reel or a gill net, and a line or other hauler on board.

This type of boat will be distributed to the fishermen to be chosen by the Fisheries Department for the spread among fishermen in general. The Department will offer technical guidance for the selected fishermen before distribution. After the distribution as well, the Department will monitor the way the boats are operated, and accordingly provide the fishermen with technical guidance.

d) Fishing gear and materials

These will be used by the Fisheries Development Center for the development of fishing gear and methods, for experimental fishing operations, and for the spread of fishing techniques among fishermen. Among them are materials for tuna longlines, vertical lines, troll lines and gill nets. They will also include compasses, small navigational devices, life jackets and other equipment that the Department is instructing the fishermen to have aboard on their boats for easier operations and greater safety at sea. All of these pieces of equipment will be used at sea to provide technical guidance and to help with their spread among the fishermen.

e) Project car

This car will be used by the Fisheries Development Center for its research, instructional and other activities. This kind of car is indispensable for the smooth operations of the Center in transporting its researchers and instructors, or equipment and materials. One vehicle will be introduced for exclusive use by the Center.

f) Laboratory equipment

These will be installed in the laboratory of the Fisheries Development Center for use in experiments and studies in the survey of the marine environment, the

analysis of processed fish products for quality, the development of aquaculture, and other articles.

The survey and monitoring of the marine environment will be conducted both at sea on the experimental fishing boat, and in the laboratory by analyzing sample seawater for salinity, density, pH, dissolved oxygen content and other properties, and by identifying, counting or other analyses of sampled plankton. In the development of processed fish products, basic laboratory experiments will be conducted in fundamental food processing research. In the inspection of food, the level of crude protein, the number of bacteria, and other qualities will be measured. Basic general-purpose equipment to be used for these experiments and analyses will be introduced in the laboratory.

g) Fisheries data analysis and management equipment

The Fisheries Department is beginning to prepare and manage statistical data by using computers. However, these computers are all old-models and of different formats, so that there is no data interchangeability between them, with the undesired result of inefficient data organization. In this situation, it is necessary to make it possible to use data more effectively and perform research and analytical operations more efficiently not only by organizing and storing data on fisheries and research results that will substantially increase following activities by the Fisheries Department and the Fisheries Development Center, but also by building a database so that each section and personnel can use each other's statistical and research data. In response to this need, a network of equipment for data processing/ management will be introduced in the Fisheries Development Center for the sharing of data among each section.

h) Audiovisual aids

Slide projector and other audiovisual aids will be introduced in the Fisheries Development Center to create a more effective training environment and for use in other instructional activities.

i) Radio equipment

SSB radio equipment will be installed in the Fisheries Development Center for communication between the Center and the exploratory fishing boat in assisting the boat with its operations.

To prevent fishing boats from being involved in marine accidents and to improve safety at sea, safety devices and a means of communication with fishing boats must be provided and distributed along with the training for the fishermen to use them. To this end, it has been decided to equip fishing boats with portable radio equipment to establish a communication system with fishermen's cooperatives, the Fisheries Department, and other relevant land-based organizations. In line with this decision, VHF small radio equipment will be installed at each fishermen's cooperative and the Fisheries Department; furthermore as an attempt to spread them among fishermen as part of the technical guidance program, 20 sets of VHF transceivers will be introduced in fishing boats.

j) Equipment and materials for the Workshop

For use in the Workshop attached to the Fisheries Development Center, equipment, tools and materials for the repair of outboard engines, small diesel engines, etc. will be provided.

k) Air compressor

This will be installed in the Compressor Room of the Fisheries Development Center's Diving Equipment Room for use in filling diving air cylinders.

2) Equipment for the Fisheries Complex

For use by the Fisheries Complex, the following equipment will be introduced:

a) Fish transport vehicle to be purchased

In expanding the quantity to be handled by the Fish Marketing Corporation, Ltd., it is necessary to increase the freezer and cold storage capacities, and at the same time the capacity to transport purchased fish. The existing two trucks with insulated van (load capacity 2 tons each) are in full operation carrying purchased fish during the bumper period. Under the Project, the annual purchase quantity will be increased from the current 250 tons to 360 tons, and the daily purchase quantity during the bumper period will also increase by an average of 50%. To deal with this increase, it is imperative to add one 2-ton truck with insulated van to the existing two.

(b) Sales equipment

The new frozen-fish sales station to be installed by renovating the existing fish market must be visible to general consumers and convenient for them to shop