

CHAPTER 5

PLANNING OF CONSTRUCTION WORK

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5-1 Planned Facilities

(1) Scope of work to be conducted by the Government of Japan

- 1) Landing quay (including dredging, road construction, and pavement)
- 2) Cold Storage (including forklifts and balances)
- 3) Packing hall (including an office)
- 4) Other services (a crane, water and fuel supply)

(2) Necessary Measures to be Taken by the Government of Mauritius

- 1) Securing of an access road in order to realize the Project.
- 2) Provision of facilities for electricity, water supply, drainage and other incidental facilities to the project site.
- 3) Provision of available data and information needed for the Project.
- 4) Demolition or removal of the existing structures
- 5) Ensuring construction vessels access to the site freely and easily.
- 6) Prompt customs clearance and internal transportation of imported material.
- 7) Exemption of taxes, duties imposed locally on material and equipment for the Project.
- 8) Exemption of local duties, taxes, etc. imposed on the Japanese personnel concerned.
- 9) Granting entry and stay permits to the Japanese personnel.
- 10) Proper and effective use and maintenance of facilities granted.

5-2 Construction Plan

5-2-1 Local Conditions

The following construction projects financed by the World Bank, the African Development Bank, etc. are being carried out under the economic boom in the country.

- 1 Motorway through Port Louis Project
- 2 Phoenix-La Vige-Nouvell France Motorway Project
- 3 First Highway Project

The above projects are scheduled to be completed by the end of this year, with a possible extension, which may result in problems from shortage of coarse aggregate and labor force. With such a situation in mind, the work schedule should be prepared so as to avoid any problems.

(1) Construction material

1. Stone and sand

Concrete aggregate is obtainable by crushing stone, an abundant resource, collected in the sugar cane fields. A large quantity of coral sand is not available due to the government restriction.

2. Cement and ready-mixed concrete

Imported bulk cement is packed into bags, and the local stock is sufficient.

Two firms are involved in producing ready-mixed concrete, productivity of which is 80 cu.meters a day each. Concrete hollow blocks are produced locally.

3. Steel

Steel materials and steel bars are imported from European nations and South Africa. A constant supply of the material is difficult due to insufficient stock.

(2) Labor

The wages for unskilled labor are 75 Rupees per day, an increase of 20% over last year. Skilled workers such as carpenters, barbenders, dozer operators, etc. are available, but operators of heavy cranes are not existent.

(3) Construction machinery

Local construction firms own lots of machinery for earth and pavement work such as dozers and excavators, which are not maintained properly. It is difficult to hire them on an hour-contract basis.

Concerning machinery for marine work, a grab dredger, hopper barges, a flat barge, tug boats, etc., are owned by the Mauritius Marine Authority, and can be rented for the contractor.

(4) Construction standard

Both civil and building work are based on the British standards. Due to the lack of specific laws and regulations in Mauritius governing the type of civil and building work involved in the current Project, Japan's architectural and construction laws, regulations and various standards shall be applied as a principle.

(5) Local construction firms

There are several construction firms which have experience in road and building construction. After checking some of their projects, such as construction of the concrete bridge financed by AfDB, it is recognized that these firms have sufficient ability to carry out civil and building work.

5-2-2 Work Plan

(1) Construction methods

The construction work of the fishing port can be divided into the following categories:

Basic Facilities (Landing quay)

- 1) Dredging
- 2) Dumping stone
- 3) Steel sheet piling
- 4) Concrete capping
- 5) Reclamation and revetment
- 6) Road construction
- 7) Ancillary work

Functional Facilities (Cold storage, etc.)

- 1) Foundation work
- 2) Steel frame erection
- 3) Roofing work
- 4) External walls
- 5) Exterior and interior finishing work
- 6) Installation of a chilling plant, etc.

Marine work covers items 1) - 4) listed in the table for the basic facilities.

Dredging and the dumping of dredged material will be conducted with the machinery owned by M.M.A. As replacement of material of soil, stone and sand carried on barges will be dumped with a crawler crane fixed on a flat barge.

Steel sheet piles will be driven into the replaced seabed with the same crawler crane equipped with a vibration hammer.

The machinery for the above construction work will be available on the basis of a contract with M.M.A. However, machinery which will be involved for a long period, such as a dozer and a wheel loader, should be transferred from Japan in order to avoid any trouble with breakdown of machinery, and to keep on the schedule.

(2) Construction yard

Steel sheet piles, steel bars, building materials, etc., which will be imported from Japan, will be landed at the general cargo quays No. 2-4, and temporarily stocked in the yard just behind Quay C after customs clearance. The stone and sand for replacement will be stocked in the yard where old buildings have been demolished near the customs gate.

5-2-3 Construction Supervising Program

To comply with the policy set forth by the Japanese Government on the grant, the consultant shall form a project performance team, to cover consistently the whole period of the project implementation from the detailed design stage through the supervising stage, as per the framework set by "the Basic Design". During the work supervisory stage, the consultant shall provide competent resident engineers as well as periodically by dispatch specialist engineers in pace with the work schedule, to guide and inspect and witness the work's execution.

(1) Major Objective of the Supervisory Work

- 1) To control the work on time according to the construction schedule, maintaining close contact with and reporting to the authorities and the responsible personnel in both countries.
- 2) To provide adequate guidance and advice to those concerned with the work's execution so that they can complete construction of the facilities to meet the design plans.
- 3) To adopt the local method of construction, using local materials and subcontractors as much as possible.
- 4) To transfer technology concerning construction methods and engineering to make the most of the grant.

- 5) To provide adequate advice and guidance in relation to the maintenance of the delivered facilities to help smooth operation thereof.
- (2) Details of the Supervisory Work
- 1) Assistance in concluding contract on the Work
To provide assistance in selecting contractors, determining the type of contract, preparation of drafts of contract agreements, reviewing details in work plans and witnessing contract awarding.
 - 2) Checking and Approval of Shop Drawings, etc.
To check and approve shop drawings, samples of materials and finishings, and equipment submitted by the contractors.
 - 3) Guidance in Construction Work
To review work plans, process, etc., and provide guidance for contractors, and report the progress of the work to the owner.
 - 4) Assistance in Payment Approval Procedures
To collaborate in checking and processing bills on payments for progressing work and completed work.
 - 5) Witnessing Inspections
To inspect periodically each progressing and completed work and guide the contractor. The consultant shall, upon confirmation of the completion of the work and the fulfillment of requirements of the contract, witness delivery of the objects of the contract and confirm owners' acceptance thereof to complete obligations. The consultant shall also provide reports for the Government of Japan in relation to work progress, payment procedures and delivery of completed facilities.

Total organization for the Project is shown in Fig. 5-2-1.

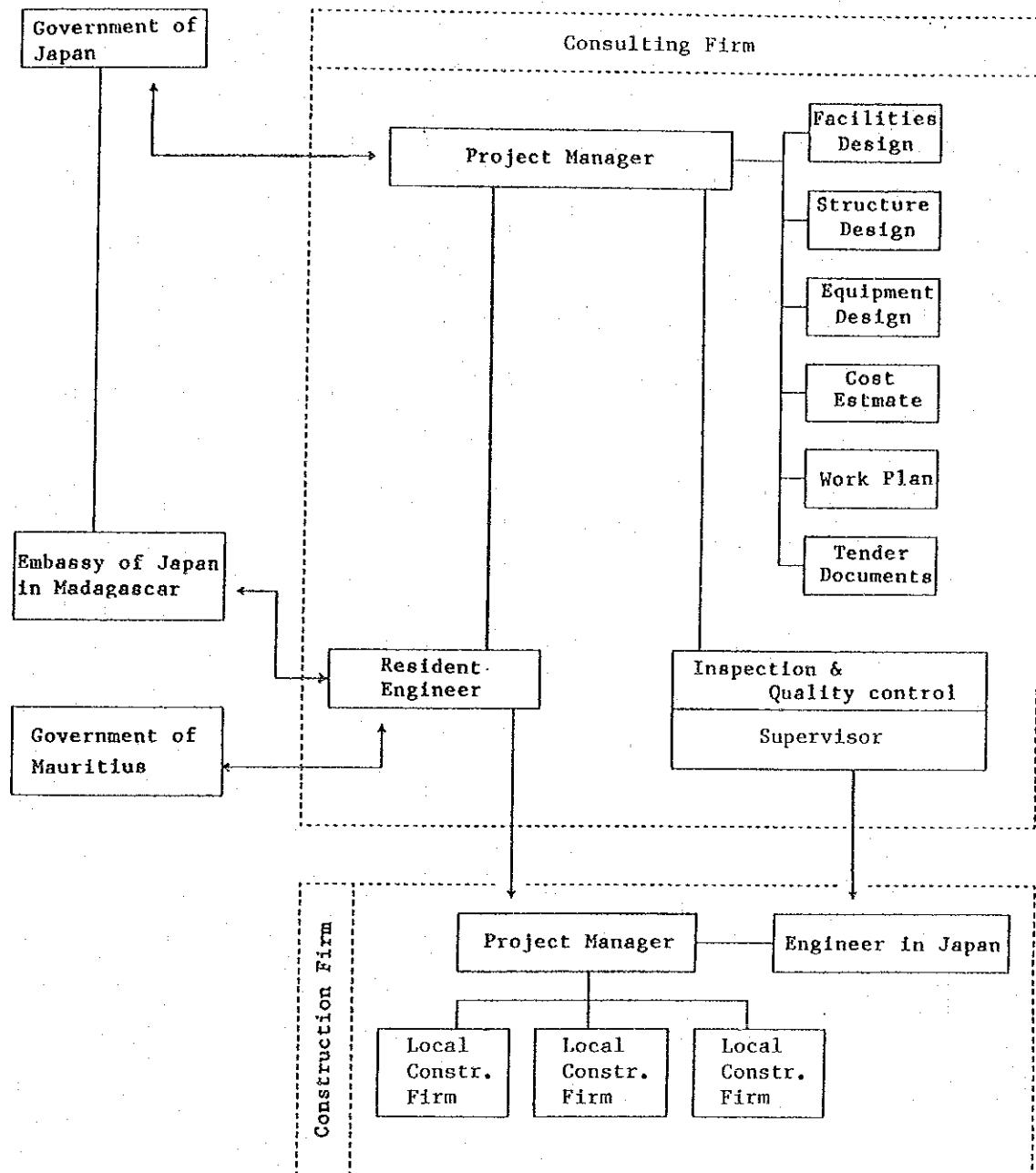


Fig. 5-2-1 Total Organization for Supervision

5-3 Construction Schedule

The following chart shows the outline of the schedule from the detailed design study to the commencement of work.

The total term of work is estimated at 23 months, summing up the period for the detailed design stage of 5 months and for construction stage of 18 months.

Due to the budget system of the Government of Japan, the Project will be divided into the following two phases.

1) First phase

Dredging

Improvement of subsoil

Driving steel sheet pile

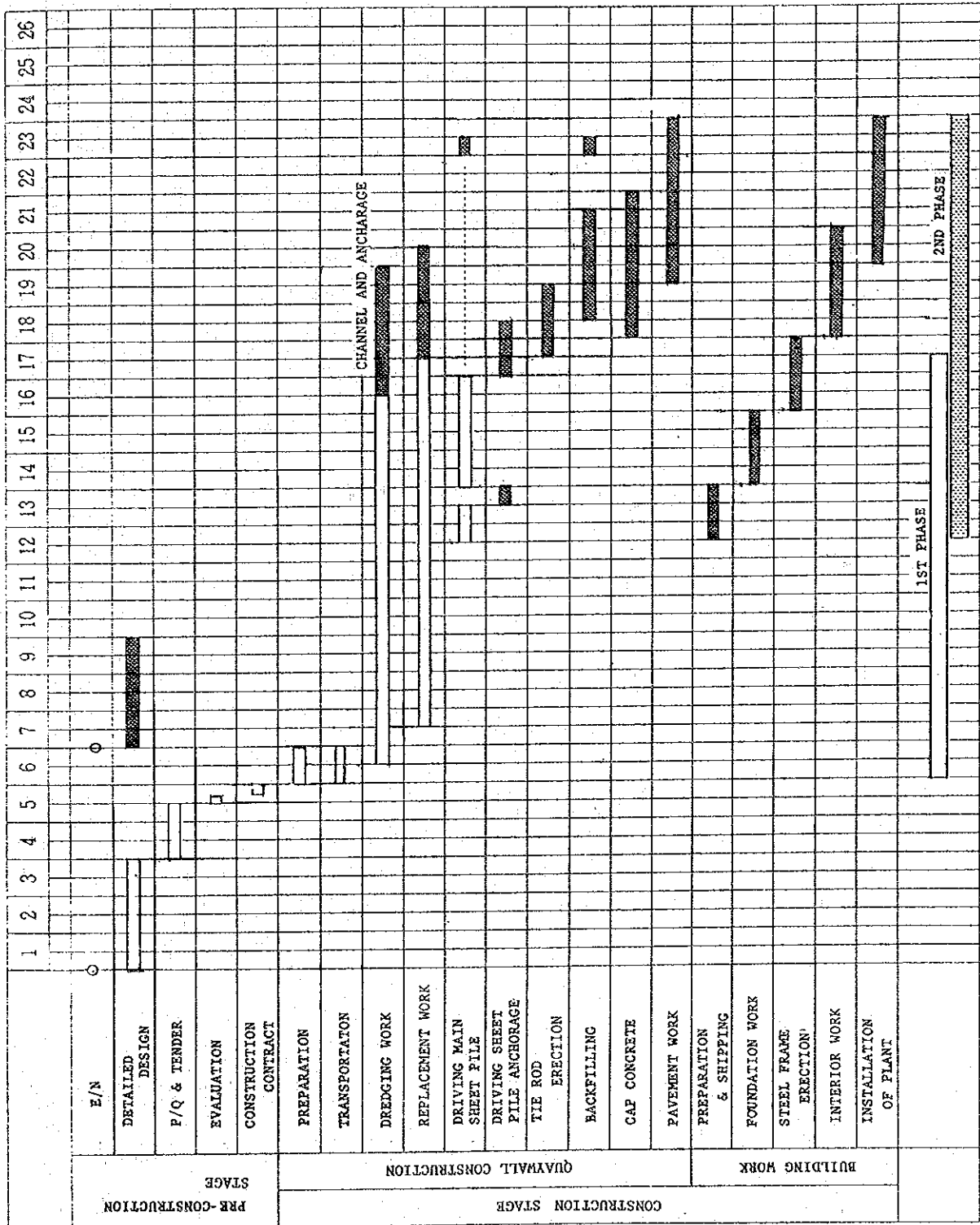
2) Second phase

Cap concreting

Road/pavement

Cold storage facility

WORK SCHEDULE



CHAPTER 6

PROJECT EXECUTION SYSTEM

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6-1 Administration Sectors

As a result of the consultation with the personnel concerned of the Government of Mauritius, it has been confirmed that the following organizations will be responsible for the respective stages of the project execution.

(1) Tender and contract

Ministry of Agriculture, Fisheries and Natural Resources
Representative: Mr. R.R.Dookhony, Permanent Secretary

(2) Project execution

Mauritius Marine Authority (MMA)
Representative: Mr. J.H.Nagdan, Director-General

The MMA played a similar role in the previous fishing port construction project and agreed to establish the priority of the equipment in working in the port. The MMA is the extra-governmental organization which is directly controlled by the Prime Minister's Office and which is totally responsible for the management of the Port Louis harbour.

(3) Facility management and maintenance

1) Landing quay

Mauritius Marine Authority (MMA)

The existing fishing quay is managed by the MMA and the weight of the fish catch is confirmed by 2 traffic officers. Actual unloading is entirely conducted by stevedores of the Cargo Handling Corporation (jointly funded by the Government and the MMA). Tuna transshipment is attended by customs officers.

Maintenance and repair of the port facilities are Port Engineer's duties and the Port Master is responsible for port operation for fishing vessels.

The new fishing quay will require the same number of officials. However, it is confirmed that the current staff will be able to run the new quay in addition to the existing quay as they will be adjacent to one another and that no permanent staff will be required for the new quay.

The Mauritius Marine Authority employs 579 persons who are attached to the organization composed of four departments shown in Fig. 6-1-1.

The staff of the departments of Engineering, Marine and Traffic will be involved in operation and maintenance of the fishing port.

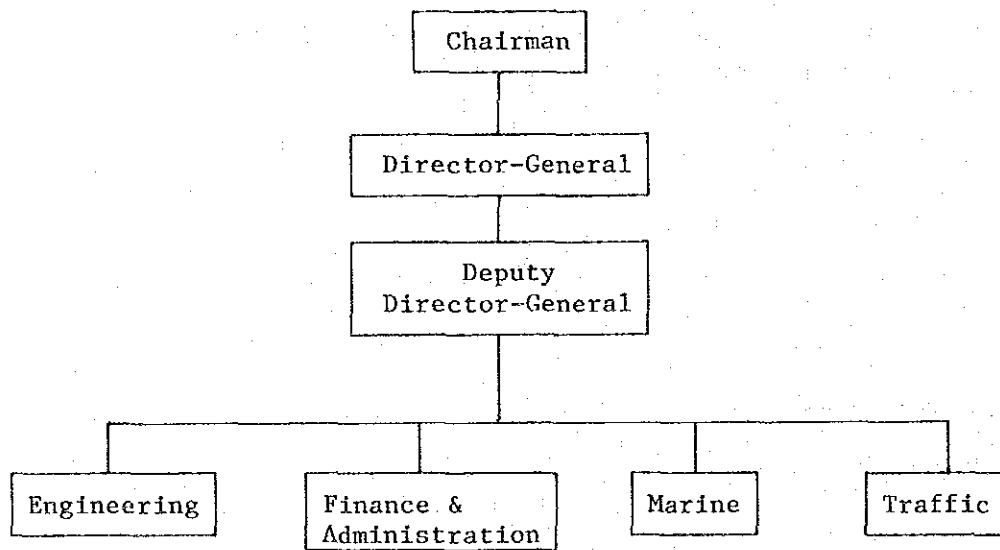


Fig. 6-1-1 Organization of MMA

2) Cold storage

The Ministry of Agriculture, Fisheries and Natural Resources (MoAFNR)

The Agricultural Marketing Board (AMB)

While the MoAFNR will be directly responsible for the cold storage, its actual management will be in the hands of the AMB which is an extra-governmental organization attached to the MoAFNR. The activities of the AMB aim at encouraging the production locally, limiting price fluctuations with provision of its own cold storage and supplying agricultural production to satisfy consumer demands.

The AMB is mainly involved in the purchase and regulated marketing of agricultural products. It also manages cold storage with a capacity of 12,000-ton class, with sufficient experience of the management and maintenance of the cold storage. It is believed that the AMB will be the appropriate sector for the cold storage management. The AMB is composed of three divisions with 137 employees as shown in Fig. 6-1-2.

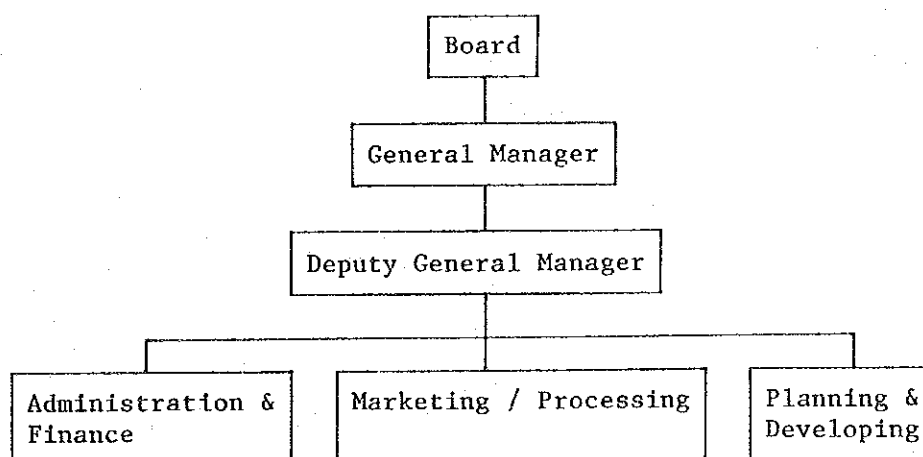


Fig. 6-1-2 Organization of AMB

6-2 Operation Staff Planning

The necessary staff for operation of the new fishing port is mentioned below and organization charts for operation of the facilities are shown in Fig. 6-2-1

(1) Staff for Fishing Port

Traffic officer	2
Customs officer	2

The above officers are involved in operation of the existing fishing quay. As described in 6-1, no extra-officer will be necessary.

(2) Staff for Cold Storage

The present staff in charge of operating the cold storage will be involved in the management of the new cold storage, and some of necessary mechanics will be recruited. The present staff of the Marketing/Pressing Division is listed below.

Managers of Cold Storage	4
Chief Engineer	1
Engineer	1
Mechanics	11
Electrician	1
Machine Room Attendants	1

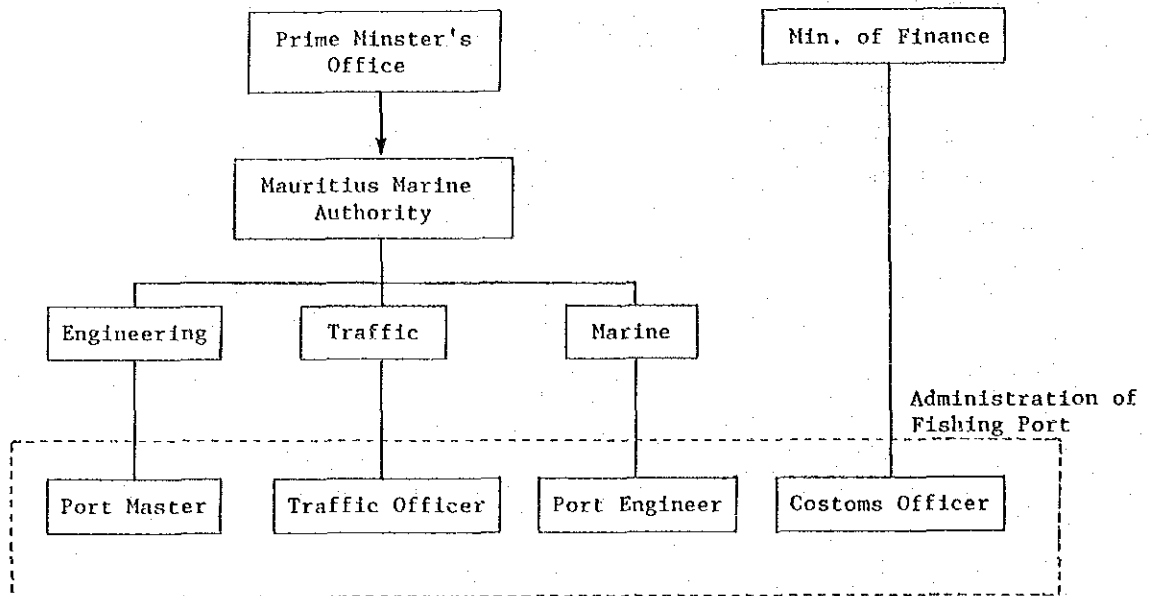
The following staff is proposed for the operation of the new cold storage.

Manager	1
Engineer	1
Mechanician	4
Chief Clerk	1
Assistant Clerk	1
Forklift Operator	2

- The engineer currently serves for other cold storage and will provide operation and maintenance instructions when necessary.

- The clerks will be engaged in storage administration, such as measuring and sending storage bills, etc.
- The refrigeration system will operate 24 hours/day with 4 mechanics in two shifts. The day-shift mechanic will conduct the daily maintenance work.

FISHING PORT



COLD STORAGE

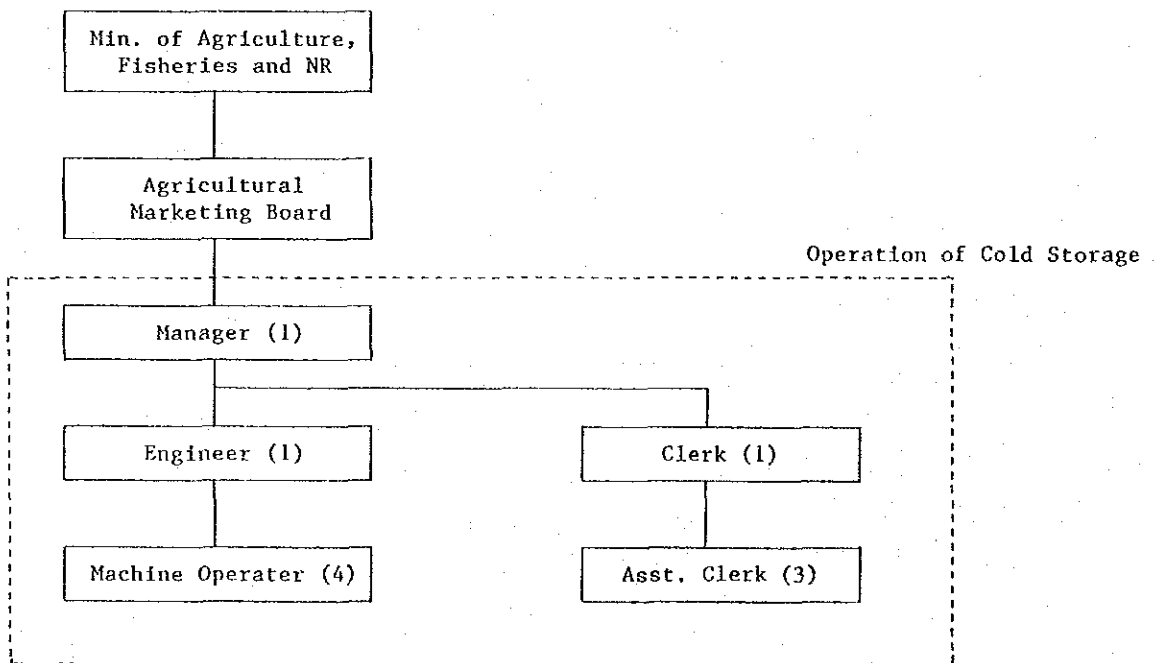


Fig. 6-2-1 Organization of the New Facilities

6-3 Operation Cost

6-3-1 Fishing Quay

Usual maintenance costs after completion will be needed for the painting of corner protection metal, curbing and mooring bitts, and change of fender bolts. Annual cost for them will be 0.1% of the total construction cost of these facilities, i.e. about Rs 4,000.

The cost is believed to be prepared with the total maintenance cost of the harbour, the budget of which was Rs12,800,000 in fiscal 1987.

6-3-2 Cold Storage

(1) Operation cost

Operation cost for the new cold storage is estimated as follows:

1) Electricity

252 tons x 500 KWA/year/ton x 1.45 Rs/KWA = Rs182,700

2) Water

16 c.m/day x 365 days x 6.16 Rs/c.m. = Rs35,974

3) Labour

Manager 1 x 12 mths x 6,000 Rs/mth = Rs72,000

Engineer 0.3 x 12 mths x 6,700 Rs/mth = Rs24,000

Clerk 1 x 12 mths x 3,600 Rs/mth = Rs42,000

Asst. clerk 3 x 12 mths x 2,100 Rs/mth = Rs72,000

Forklift optr 4 x 12 mths x 3,000 Rs/mth = Rs144,000

Total

Rs355,200

4) Office

Transportation cost 2,000 Rs/mth x 12 mth = Rs24,000

Office supplies 1,500 Rs/mth x 12 mth = Rs18,000

Communication cost 1,800 Rs/mth x 12 mth = Rs21,600

Welfare expenses 355,200 Rs/mth x 0.05 = Rs17,760

Total

Rs81,360

5) Repair & maintenance	Rs36,000
6) Overhead	Rs21,312
7) Others	Rs22,578

Grand Total	Rs735,124
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The storage fees of private cold storage firms are generally 125-150 Rupees/ton/week or some 100 Rupees/ton/week for large quantity contracts. Operation cost for the new facilities will be covered with the storage fees proposed as 100 Rupees/ton for initial two weeks and 190 Rupees afterwards.

Considering each turnover for the storage terms is 6.26/year, the total storage fee will be

(for initial two weeks) $252 \text{ tons} \times 6.26 \times 100 \times 2 = \text{Rs}315,504$
(for more than two weeks) $252 \times 0.7 \times 6.26 \times 190 \times 100 \times 2 = \text{Rs}419,620$

Rs735,124

It is understood that the AMB will be able to operate the new cold storage by itself, in view of the proposed storage fees, which is equivalent to the present ones of private firms, and necessity of the facility to compensate the inland shortage of storage capacity. The team confirmed and recognized that the Government of Mauritius will easily budget the necessary cost for the operation, which is equivalent to only 0.2% of the total budget of MoAFNR.

Therefore, it is no doubt that the new cold storage will be operated well without any management problems so as to play the given roles.

(2) Budgeting Opening Cost

On the occasion of opening the new cold storage, the initial cost for operation and purchase of office equipment will be necessary for two or three months. The initial opening cost will include the expenses for personnel, office, preparatory operation, electricity, etc.

It has been confirmed that the AMB will be able to budget the necessary cost at the opening of the said facility, referring to the annual budget of the body such as Rs24,000,000 in 1985 and Rs27,000,000 in 1986.

CHAPTER 7

PROJECT EVALUATION

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The Trou Fanfaron fishing port, granted to the Government of Mauritius by the Government of Japan in March, 1985, is an important base for bank and pelagic fishing. The importance of its facilities is expected to increase in the future with the further development of fisheries in Mauritius. The extension of the fishing port facilities under the Project is, therefore, highly appreciated in Mauritius as a part of the National Development Plan.

The project evaluation was conducted as mentioned below, from the viewpoint of benefits of the new fishing quay and cold storage. As a result, the Project was judged to be feasible as grant aid cooperation since the direct and indirect benefits were confirmed.

7-1 Development Benefits of Facility Expansion and Consolidation

7-1-1 Benefits of Extended Fishing Quay

(1) Direct Benefits

- 1) Reduced waiting time and improved unloading efficiency by additional mooring facilities

As described in Chapter 3, there is a shortage of 2 berths at the existing fishing quay in terms of the efficient handling of the fishing vessels using the quay. The additional 2 berths to be provided under the Project will reduce the current waiting time, thereby improving the unloading efficiency.

- 2) Reduced waiting time of large fishing vessels and improved unloading efficiency by increased water depth of the fishing quay

Following the completion of the new fishing quay with an increased water depth, those large fishing vessels currently using the commercial quays and often ordered to move to other quays because of their low priority vis-a-vis cargo ships will no longer have to wait for their turn to unload, resulting in an improved unloading efficiency.

(2) Indirect benefits

The following indirect benefits are anticipated.

- 1) Increased catch due to the increased number of fishing days, in turn resulting from the reduced waiting time in the fishing port.
- 2) Increased employment opportunities for the port workers due to the provision of 2 additional berths.

7-1-2 Benefits of Cold Storage

(1) Direct benefits

- 1) Reduced waiting time of fishing vessels due to cold storage shortage and increased number of fishing days

At present, the number of fishing days in bank fishery are kept small for fishing vessels to be used for temporary storage purposes until the sale of the fish catch can be confirmed.

With the provision of cold storage at the new fishing quay, these wasted days can be either partially or entirely used for fishing purposes and a minimum of one additional trip/year can be secured for each bank fishing boat.

- 2) Reduced operation costs due to decrease of waiting time

Fish prices are expected to be stable.

- 3) Prevention of fish price collapse due to hasty sale

During the end of the year period, increased imports of frozen foods which have priority over fish leave little cold storage space for frozen fish. Consequently, the latter is stored on fishing boats, reducing the number of fishing days. In the high season for fishing, the catch temporarily stored on board is quickly sold at a low price, thereby affecting the business of small fishing operators. The provision of new cold storage will improve this situation and will further promote bank fishing.

(2) Indirect benefits

An increased number of fishing days is expected to achieve an increased catch. If the number of trips for the 7 fishing vessels regularly operating at present is increased by 1 trip/year/boat, the annual catch will be increased by some 700 tons, achieving the medium-term production target. As a result, a reduction in fish imports, i.e. increase of the self-supply ratio, will also be achieved.

7-1-3 Other Benefits

In addition to the direct and indirect benefits of the Project described in the previous sections, the following benefits are also anticipated.

- (1) Promotion of investment in pelagic fishery-related industries following the extension of the fishing port and resulting increased employment opportunities.
- (2) Increased employment and income following the construction work.
- (3) Increased land area due to the land preparation work and improved land productivity.

Taking all the above benefits into consideration, the Project is to be of great significance for the promotion of fishery in Mauritius.

7-2 Evaluation from Viewpoint of Natural Condition & Execution Methods

The project site is located at the innermost part of the Port Louis harbour, and deemed to be the best place for the new fishing port without any influence of tidal currents, littoral drift, and wave action. It is understood that the unloading of fish catch will not be affected and that no siltation will occur there.

Despite accumulation of seabed material of the thick loose silty clay on the steep bedrock, there remains no problem in constructing a

steel-sheet-pile quay with improvement of subsoil material as the existing fishing port was constructed. For the execution of the methods, working craft are locally available.

Considering the above, the Project will be appropriately carried out without any doubts.

7-3 Evaluation from Viewpoint of Management & Maintenance

* Organization for management & maintenance

The Mauritius Marine Authority will be responsible for operation and maintenance of the new fishing port. The body, which is the extra-government organization, operates the Port Louis harbour and the existing fishing port.

The Agricultural Marketing Board, which is the extra-government organization attached to the MoAFNR, will be engaged in operating the new cold storage. The activities aim at supporting prices of agricultural products, promoting exports of the products, with the cold storage.

It is believed that the both parties have sufficient experience and capabilities for managing the respective facility.

* Staff

No extra-staff of the MMA will be involved in the operation of the new quay, since the two officers of the MMA and of the Custom House manage the existing fishing quay and will be able to run the new quay.

The new cold storage will be operated by the ten staff of the AMB which are believed to have capabilities for management and maintenance of the said facilities.

There is no difficulty in staffing plan for the management of the both facilities in view of the respective scale of the organization, and the projected facilities will be managed well by the two bodies.

* Operation cost

Operation cost of the landing quay is estimated at about Rs4,000 only for usual painting of the metal facilities, and will be covered with quay fees paid by fishing vessels.

The AMB is believed to budget the necessary opening cost for three months for the new cold storage, and to compensate the operation cost with storage fees, which is almost equivalent to the fees of the private firms.

Since both bodies have their own management establishment with a self-supporting accounting system, they will be able to manage the facilities for the Project.

Accordingly, it is understood that the management of the said facilities will be performed well by the organization concerned.

From the viewpoint of the management and maintenance, the Project is considered to be feasible.

CHAPTER 8

CONCLUSION AND RECOMMENDATIONS

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8-1 Conclusion

The Fisheries Development Plan of the Government of Mauritius lays stress on an improved self-supply ratio of fish by the promotion of bank fishery, the promotion of pelagic fishery and the increased earning of foreign currency through the development of the canning industry. In this context, the fishing port facilities granted by the Government of Japan in March, 1985 have been playing an important role in the development of Mauritian fisheries by providing a fishing base.

With the various fisheries promotion measures of the Government of Mauritius and the improved infrastructure by the Japanese grant aid cooperation, the bank fishing catch in 1987 totalled 5,150 tons, approaching the medium-term production target. In addition, the trade balance for fish and fish products has been in the black since 1983 due to the development of skipjack/tuna fishing and canning by a joint venture between private Japanese and Mauritian companies. There is strong belief that further development of the pelagic fishing industry, and the related processing industry will take place along with the expansion of the bank fishing industry.

At present, however, the capacities of the port facilities, which provide the basis for fishing operation, are inadequate. The project for the extension of these facilities is expected to improve the situation and result in the further development of fishery in Mauritius. Therefore, it is recommended that the Project as grant aid cooperation be put into effect at an early date.

8-2 Recommendations

The following are recommended with the view of fully materializing the effects of the Project.

(1) Smooth control of fishing quay

Fishing vessels to moor at the fishing quay (with the additional 2 berths provided under the Project) should be limited to those unloading the catch or making preparations to return to sea so that no fishing boat wastes time waiting for a vacant berth and idle fishing vessel should be moored to posts off the quay to avoid congestion near the quay.

(2) Proper maintenance and appropriation of maintenance cost

Proper maintenance/repair of the facilities and machinery is indispensable to prolong their working lives and for their efficient utilization. Therefore, regular checks and maintenance/repair should be planned and the necessary cost appropriated.

(3) Appropriation of management cost and manpower

The manpower required to run the facilities should be secured during the construction period so that the facilities can be utilized immediately after their completion. Therefore, the management cost should be appropriated in the budget to run these facilities.

(4) Operation of cold storage

The cold storage is mainly intended for speedup of the unloading of frozen fish in order to shorten the waiting time of the fishing boats in the port. Therefore, the cold storage should always be able to accept new cargoes to achieve this objective. For this purpose, an adequate operational method and fee system will be necessary to increase the turnover rate with consideration given to not increasing the burden on small fishing operators but to improving their position.

APPENDICES

I Appendices for the Basic Design Study

- I-1(1) Organization of the Agricultural Marketing Board
- (2) Revenue and Expenditure Account
- I-2 Results of Laboratory Tests for the Basic Design Study for the Existing Fishing Port
- I-3 Windroses at Port Louis
- I-4 Wave Hindcast Results

I-1(1) Organization of the Agricultural Marketing Board

CONSTITUTION

In accordance with Section 4 of the Mauritius Agricultural Marketing Ordinance No. 38 of 1963 (as subsequently amended) the Minister of Agriculture, Fisheries & Natural Resources had by Notice No. 386 of 1984 constituted the Agricultural Marketing Board for the year 1984 as follows:

<i>Chairman</i>	: Mr. K. Servansingh
<i>Vice Chairman</i>	: Mr. J. Ramjada, Administrative Officer, Ministry of Agriculture, Fisheries & Natural Resources up to July 1984. Mr. I. Rajkomar, Ministry of Agriculture thereafter.
<i>Official Members</i>	: A representative of the Ministry of Finance. The Permanent Secretary, Ministry of Trade & Shipping or his representative. The Registrar of Cooperative Societies or his representative.
<i>Unofficial members</i>	: Dr J. C. Autrey Mr. Philippe Chan Mr. J. Dacruz Mr. C. Fookune Mr. D. Sarjua Mr. Jean Baptiste Wiehe Mr. M. Murday, representative of Agricultural Marketing Board workers.

SENIOR ADMINISTRATIVE STAFF

<i>General Manager</i>	: Mr. B. Joynathsing, B.A. Hons Econ., M. Phil (Agricultural Econ.)
<i>Deputy General Manager</i>	: Mr. F.C. Lim Fat, B.Sc.
<i>Secretary/Accountant</i>	: Mr. M. Boodhna, A.C.C.A.
<i>Section Heads</i>	
<i>Stores Manager</i>	: Mr. S. Dahal, Diploma in Public Administration.
<i>Senior Marketing Officer</i>	: Mr. K.B. Daby.

I-1(2) Revenue and Expenditure Account

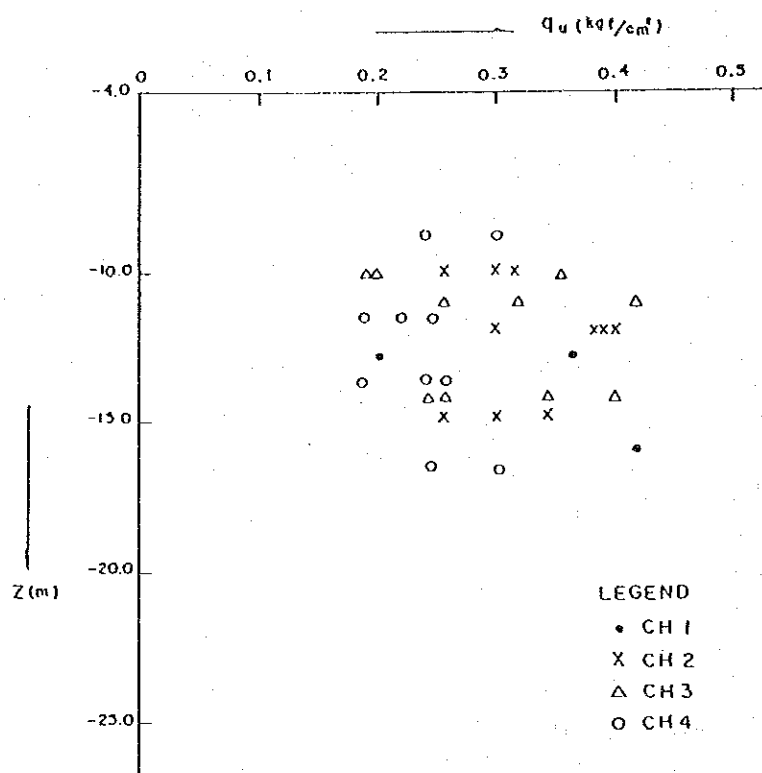
Revenue and Expenditure Account

Year ended December 31, 1984

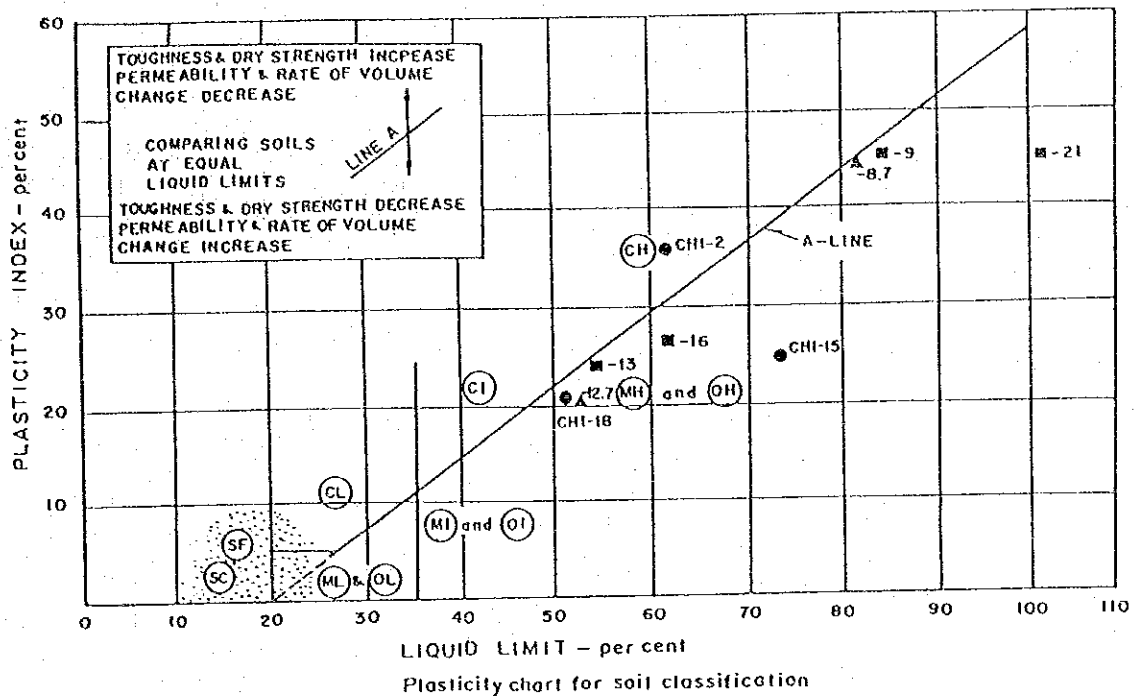
	1984	1983
	Rs	Rs
SURPLUS BEFORE CHARGING OVERHEADS	4,943,469	6,187,358
SUNDRY INCOME	196,480	95,857
	<u>5,139,949</u>	<u>6,283,215</u>
ADMINISTRATIVE EXPENSES	1,737,944	1,717,607
DEPRECIATION	198,875	193,578
INTEREST	2,989,399	3,974,422
	<u>4,926,218</u>	<u>5,885,607</u>
NET SURPLUS FOR THE YEAR	213,731	397,608
TRANSFER FROM GENERAL RESERVE	760	—
	<u>214,491</u>	<u>397,608</u>
TRADING EQUALISATION RESERVE BROUGHT FORWARD	(8,666,871)	(9,064,479)
PRIOR YEAR ADJUSTMENT	403,863	—
TRADING EQUALISATION RESERVE CARRIED FORWARD	<u>(8,856,243)</u>	<u>(8,666,871)</u>

I-2 Results of Laboratory Tests for the Basic Design Study for the Existing Fishing Port

1) Unconfined compression tests



2) Laboratory tests



RESULTS OF PHYSICAL TESTS

CH1

	- 1 2.5 ~ 1 3.0 M	- 1 6.0 ~ 1 6.5 M
BULK DENSITY	1.7 9 t/m ³	1.6 8 t/m ³
MOISTURE CONTENT	5 1.4 %	6 7 %

CH2

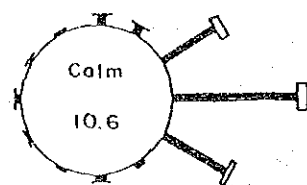
	- 1 0.0 ~ 1 0.5 M	- 1 2.0 ~ 1 2.5 M	- 1 4.5 ~ 1 5.0 M
BULK DENSITY	1.7 5 t/m ³	1.7 9 t/m ³	1.7 7 t/m ³
MOISTURE CONTENT	6 6.4 %	5 4.4 %	5 1.0 %

CH3

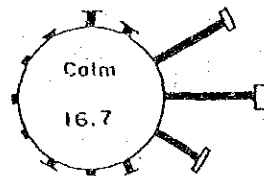
	- 1 0.2 ~ 1 0.7 M	- 1 2.2 ~ 1 2.7 M	- 1 4.2 ~ 1 4.7 M
BULK DENSITY	1.5 8 t/m ³	1.8 3 t/m ³	1.8 0 t/m ³
MOISTURE CONTENT	7 8.2 %	4 3.5 %	5 3.9 %

I-3 Windroses at Port Louis

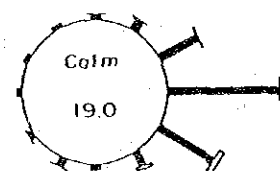
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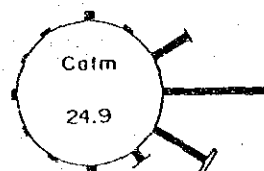
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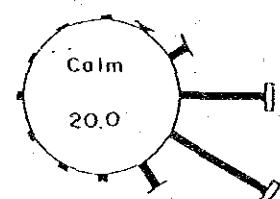
MAR.



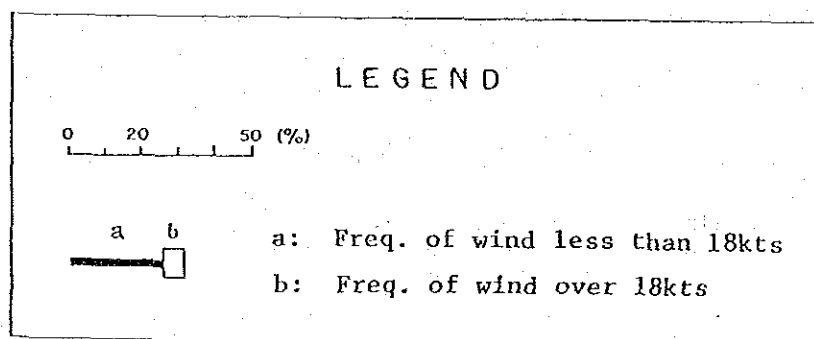
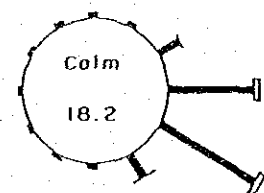
APR.



MAY

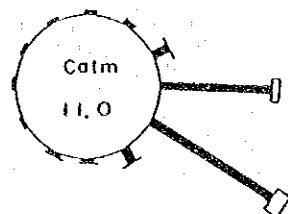


JUN.

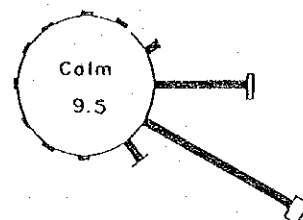


Windroses (Fort William)

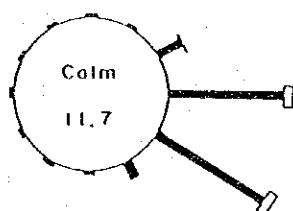
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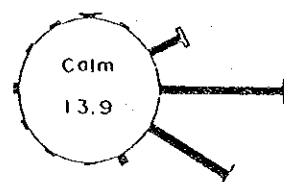
AUG.



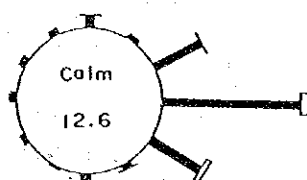
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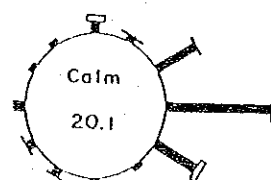
OCT.



NOV.

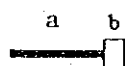


DEC.



LEGEND

0 20 30 (%)



a: Freq. of wind less than 19kts
b: Freq. of wind over 18kts

Windroses (Fort William)

I-4 Wave Hindcast Results

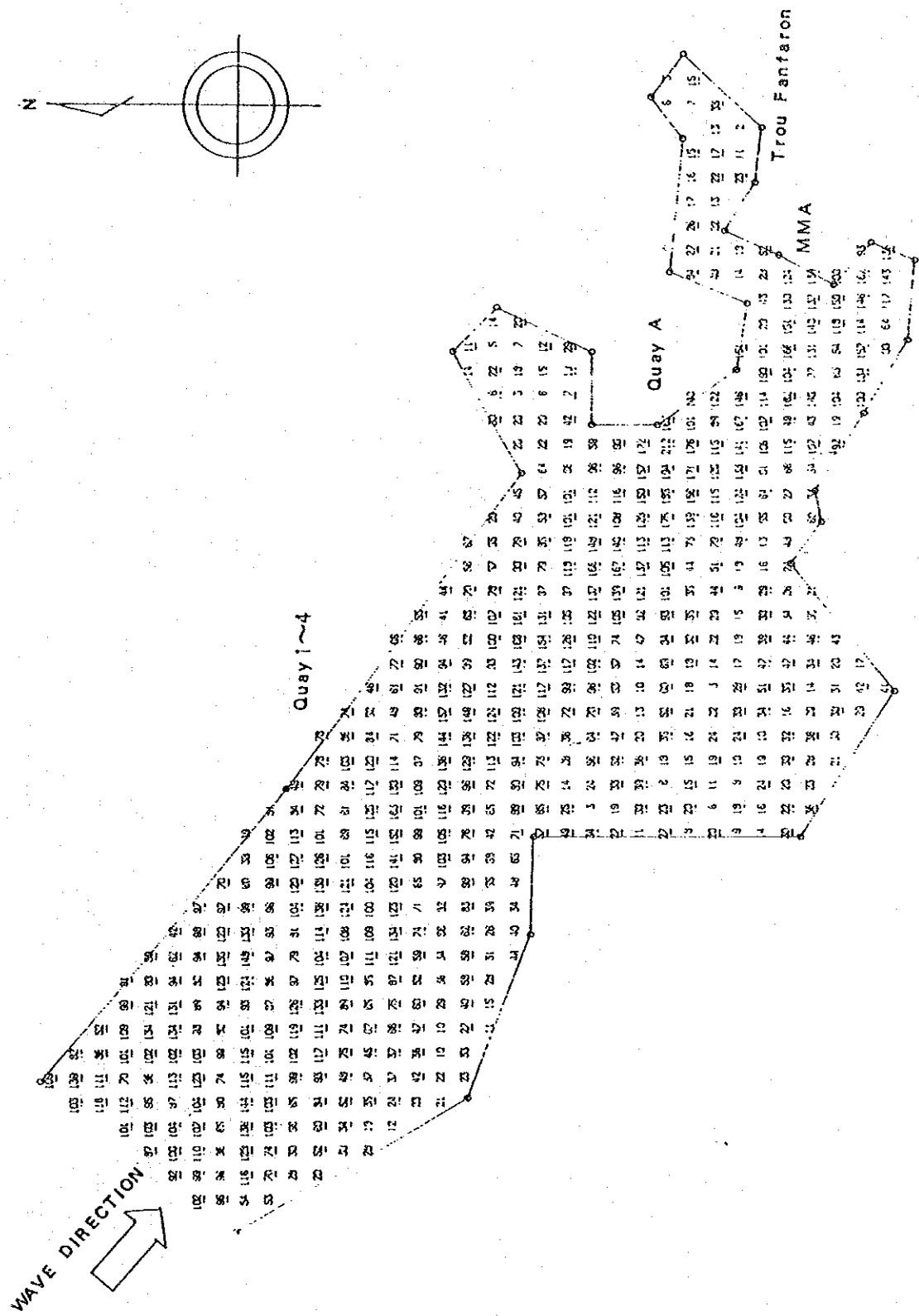
The following are the calculation results of hindcasting of waves generated by the cyclone "Gervaise", which was carried out in the "Basic Design Study for Fishing Port Construction Project".

Wave height at the harbour mouth : $H=2.4\text{m}$

Max. wave height ratio in Trou Fanfanron : $k=0.33$

Max. wave height in Trou Fanfaron : $H=2.4 \times 0.33$
 $=0.8\text{m}$

Wave height distribution in Port Louis Harbour is shown in the following figure.



Distribution of Wave Height in the Harbour

II Field Survey

II-1 Organization of Study Team

II-2 Itinerary of Field Survey

II-3 Interviewed Personnel

II-4 Minutes of Discussions

II-1 Organization of Study Team

(1) March - April, 1988

Yoshinori Ugajin	Team leader	Fishing Port Construction Division Fishing Port Dept., Fisheries Agency, Ministry of Agriculture, Forestry and Fisheries
Masaki Hoshina	Coordinator	Grant Aid Division, Economic Cooperation Bureau, Ministry of Foreign Affairs
Taiji Endo	Fishing Port Planning	Nippon Tetrapod Co., Ltd.
Kozo Matsumura	Port Civil Engineering	ditto
Hisashi Hiratsuka	Cold Storage Facility	ditto
Masafumi Ito	Natural Conditions	ditto
Kazuo Yamada	Cost Estimation	ditto

(2) July, 1988

Yoshinori Ugajin	Team leader	Fishing Port Construction Division Fishing Port Dept., Fisheries Agency, Ministry of Agriculture, Forestry and Fisheries
Taiji Endo	Fishing Port Planning	Nippon Tetrapod Co., Ltd.
Kozo Matsumura	Port Civil Engineering	ditto
Hisashi Hiratsuka	Cold Storage Facility	ditto

II-2 Itinerary of Field Survey

(1) March - April, 1988

Date

- March 27 (Sun) * Departed Tokyo and arrived at Paris
- 28 (Mon) * Departed Paris
- 29 (Tue) * Arrived at Antananarivo. General meeting with Hon. Ambassador Mr. Yamaguchi and staff of the Embassy of Japan. Departed Antananarivo.
* Arrived at Mauritius
- 30 (Wed) * Courtesy call on the Minister and Permanent Secretary of Agriculture, Fisheries and Natural Resources (MoAFNR) and Mauritius Marine Authority
- 31 (Thu) * Site visit at Trou Fanfaron and a general meeting with personnel concerned.
* Contract with a local boring firm
- April 1 (Fri) * Interview and discussion on the request of the Project and its background.
- 2 (Sat) * Collected information on local construction conditions and artisanal fishing.
- 3 (Sun) * Team meeting
- 4 (Mon) * Reviewed request contents and explained the grant aid system. Visited Albion Fisheries Research Center.
* Sounding the site and survey of boring points.
- 5 (Tue) * General meeting with MoAFNR, MoW and MoHE. Visited private cold storage.
* Topographical survey and sounding.
- 6 (Wed) * Meeting with AMB. Interview with officials concerned of MMA on Master Plan of Port Louis Harbour.
* Topographical survey and sounding.
- 7 (Thu) * Meeting with MoAFNR and MoW.
* Detailed discussions with the boring firm.
- 8 (Fri) * Signed the Minutes of Discussions.
* Started drilling BH-1.
* Messrs Ugajin and Hoshina departed Mauritius.
- 9 (Sat) * Messrs Ugajin and Hoshina arrived at Singapore.
* Meeting with MMA.
* Continued BH-1, and interviewed private construction firms to collect their quotation for unit prices of material and machinery.

- 10 (Sun) * Messrs Ugajin and Hoshina arrived at Tokyo.
* Team meeting.
- 11 (Mon) * Meeting with MoAFNR and MMA.
* Interviewed construction firms on local conditions.
* Preparation of shifting a barge.
- 12 (Tue) * Visited MTFCE, New Cold Storage and construction firms.
* Drilled BH-2.
- 13 (Wed) * Meeting with Port Master of MMA, and MoW.
* Started drilling BH-3
- 14 (Thu) * Discussion with officials concerned of the Government on cold storage.
* Discussion with the Director-General of MMA.
* Drilled BH-3
- 15 (Fri) * Discussion with MMA on berth occupancy.
* Visited private cold storage
* Drilled BH-3
- 16 (Sat) * Visited construction firms.
* Drilled BH-3
- 17 (Sun) * Team meeting and data analysis.
* Drilled BH-3
- 18 (Mon) * Visited AFRC to collect information on tuna industry.
* Drilled BH-3
* Collected data and information on filling material.
- 19 (Tue) * Collected data on economic affairs
* Drilled BH-3
- 20 (Wed) * Investigated the utilization of the existing fishing port
* Start drilling BH-4
- 21 (Thu) * Visited MoEP, and MoW
* Drilled BH-4
- 22 (Fri) * Meeting with officials concerned of MoAFNR and MMA.
* Completed drilling BH-4.
- 23 (Sat) * Messrs Endo, Matsumura, Ito, Hiratsuka and Yamada left Mauritius.
- 24 (Sun) * The above team members arrived in Tokyo.

(2) July, 1988

- July 4 (Mon) * Departed Tokyo
- 5 (Tue) * Be invited to the Agricultural Festival.
* Arrived at Mauritius.
- 6 (Wed) * Draft Final Report was submitted to MoAFNR.
* Courtesy call to Permanent Secretary of the MoAFNR.
- 7 (Thu) * Explained Draft Final Report to MoAFNR and MMA.
Through discussions, Mauritius side agreed with the Report.
- 8 (Fri) * Site investigation at the existing fishing port.
Courtesy call to Minister of MoAFNR.
- 9 (Sat) * Investigated the fishing facilities in the east coast.
- 10 (Sun) * Team meeting.
- 11 (Mon) * Explained the detailed plan of the cold storage to the Director. Discussed on the operation of the facilities.
- 12 (Tue) * Confirmed the Minutes of Discussions. General meeting with MoAFNR, MMA and AMB.
- 13 (Wed) * The Minutes of Discussions was signed by Permanent Secretary and the Team Leader.
* Arrived at Antananarivo to explain the Project and the Minutes to Mr. Yamaguchi, Ambassador to Mauritius. (Messrs Ugajin and Endo)
* Other members discussed with AMB on the operation organization.
- 14 (Thu) * Reported to Ms. Nakagawa on the present operation of the Marine Shrimp Culture Center.
* Messrs Ugajin and Endo arrived at Mauritius.
- 15 (Fri) * Departed Mauritius at 20:30.
- 16 (Sat) * Mr. Matsumura arrived Tokyo.
- 17 (Sun) * Messrs Ugajin, Endo and Hiratsuka arrived Tokyo.

II-3 Interviewed Personnel

(1) March - April, 1988

1) Mauritius Government Officials Concerned

Hon. M. Dulloo	Minister of Agriculture, Fisheries and Natural Resources (MoAFNR)
Mr. R. R. Dookhony	Permanent Secretary, MoAFNR
Mr. S. C. Seebaluck	Permanent Assistant Secretary, MoAFNR
Mr. Munboddh	Divisional Scientific Officer, MoAFNR
Mr. A. S. Gooljar	Engineer, Min. of works
Mr. P. Duhau	Dept. Chief Surveyor, Min. of Housing, Land, E.
Mr. H. D. Phokeer	Economist, Min. of Economic Planning & Devpt.
Mr. R. R. Vaghjee	Assistant Director, Meteorological Services
Mr. D. H. Nagdan	Director-General, Mauritius Marine Authority
Mr. R. Maunthrooa	Dept. Director-General M.M.A.
Capt. W. C. Toi	Port Master, MMA
Mr. S. Suntah	Civil Engineer, MMA
Mr. Judoosingh	Financial Controller MMA
Mr. Dabee	Workshop Manager, MMA
Mr. B. Joynathsing	Agricultural Marketing Board

2) Embassy of Japan in Madagascar

Mr. Yoichi Yamaguchi	Ambassador
Mr. Yoshiaki Ito	Councillor

(2) July, 1988

1) Mauritius Government Officials Concerned

Hon. M. Dulloo	Minister of Agriculture, Fisheries, and Natural Resources (MoAFNR)
Mr. S. C. Seebaluck	Permanent Assistant Secretary (MoAFNR)
Mr. Munbodt	Divisional Scientific Officer (MoAFNR)
Mr. S. Sooknundun	Engineer, Agricultural Marketing Board (AMB)
Mr. J. Nagdan	Director-General, Mauritius Marine Authority (MMA)
Mr. R. Maunthrooa	Deputy Director-General (MMA)
Capt. W. C. Toi	Port Master (MMA)
Mr. K. Dharmalingam	Port Engineer (MMA)
Mr. B. Lalsing	Traffic Manager (MMA)
Mr. V. Randeny	Accountant (MMA)
Mr. P. Duhau	Deputy Chief Surveyor, Min. of Housing, Land and Environment
Capt. P. Moorogan	Director-General, Cargo Handling Corporation (CHC)
Mr. K. Appadu	Accountant (CHC)
Mr. Joynathsing	General Manager, Agricultural Marketing Board

2) Embassy of Japan in Madagascar

Mr. Yoichi Yamaguchi	Ambassador
Mr. Yoshiaki Ito	Councillor

MINUTES OF DISCUSSIONS
ON
THE PROJECT FOR EXTENSION OF FISHING PORT
IN
MAURITIUS

In response to the request of the Government of Mauritius, the Government of Japan decided to conduct a basic design study on the project for the extension of the fishing port (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA"). JICA sent to Mauritius the study team headed by Mr. Yoshinori Ugajin, Construction Division, Fishing Port Department, Fisheries Agency, Ministry of Agriculture, Forestry and Fisheries, from March 27 to April 24 1988.

The team had a series of discussions on the Project with the officials concerned of the Government of Mauritius headed by Mr. S. C. Seeballuck, Principal Assistant Secretary, Ministry of Agriculture, Fisheries and Natural Resources and conducted a field survey in Mauritius.

As a result of the study and discussions both parties have agreed to recommend to their respective Governments that the major points of understanding reached between them, attached herewith, should be examined towards the realization of the Project.

April 8th, 1988

宇賀神 義宣
.....

Yoshinori UGAJIN
Team Leader,
Japan International
Cooperation Agency (JICA)

.....
R. R. DOOKHONY

Permanent Secretary
Ministry of Agriculture,
Fisheries & Natural Resources

.....
Dr. J. H. NAGDAN

Director-General
Mauritius Marine Authority

ATTACHMENT

1. Title of the Project

The Project for the Extension of Fishing Port

2. Objective of the Project

The objective of the Project for the Extension of the Fishing Port is to promote fisheries in Mauritius and to contribute to the development of the economy of Mauritius.

3. Executing Agency

The Ministry of Agriculture, Fisheries and Natural Resources will be responsible for administration of the Project, and Mauritius Marine Authority will be executing agency for the Project.

After the completion of the works, the Ministry of Agriculture, Fisheries and Natural Resources and Mauritius Marine Authority will maintain and manage the facilities.

4. Request of the Government of Mauritius

The team will convey to the Government of Japan the request of the Government of Mauritius that the former takes necessary measures to cooperate in implementing the project and provide port facilities listed in Annex I in order of priority within the limits of Japanese grant aid.

5. Project site

The project site will be neighboured with existing Fishing port at Trou Fanfaron in Port Louis Harbour.

6. Necessary Measures to be taken by the Government of Mauritius.

The Government of Mauritius will take necessary measures listed in Annex II on the condition that the Grant Aid of the Government of Japan is extended to the Project.

7. System of the Japan's Grant Aid Program

The Government of Mauritius side has understood the system of the Japan's Grant Aid, explained by the team, which includes a principle of the use of a Japanese consultant and a Japanese firm for the implementation of the Project.

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ANNEX 1

Items requested by the Government of Mauritius are as follows
in order of priority:-

- (1) Landing Quay (including dredging, road and pavement)
- (2) Cold Storage (including forklifts and weight balance)
- (3) Packing hall (including office)
- (4) Other services (crane, water, power, fuel supply)

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ANNEX II

Necessary measures to be taken by the Government of Mauritius

- 1) to provide access roads to the site of construction, the construction yard and for transportation of fish;
- 2) to provide facilities for distribution of electricity, water supply and drainage and other incidental facilities to the project site;
- 3) to provide available data and information necessary for the design and construction of the Project;
- 4) to demolish or remove the building and structures in the proposed site;
- 5) to ensure that all vessels for construction be given free and easy access to the construction site;
6. to ensure prompt unloading and customs clearance at the port of disembarkation in Mauritius and prompt internal transportation of imported materials and equipment to the construction yard/site;
7. to exempt any equipment, materials and supplies brought into and/or purchased in Mauritius in connection with the performance of the works from any taxes, duties, fees, etc. which are imposed in Mauritius;
8. to exempt Japanese personnel working on the project in Mauritius from customs duties, internal taxes and other fiscal levies which are imposed in Mauritius;
9. To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contract such facilities as may be necessary for their entry into Mauritius and stay therein for the performance of their work; and
10. To maintain and use properly and effectively those facilities constructed under this grant aid.

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MINUTES OF DISCUSSIONS

ON

THE PROJECT FOR EXTENSION OF FISHING PORT

IN MAURITIUS

In response to the request of the Government of Mauritius for grant assistance for the project for Extension of Fishing Port (hereinafter referred to as "The Project"), the Government of Japan decided to conduct a basic design study on the project and entrusted the study to the Japan International Cooperation Agency (JICA). JICA sent to Mauritius the team headed by Mr. Yoshinori Ugajin, Fishing Port Construction Division, Fishing Port Dept., Fisheries Agency, Ministry of Agriculture, Forestry and Fisheries from March 27 - April 24, 1988.

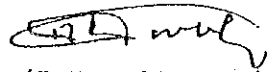
As a result of the study, JICA prepared a draft report and despatched a mission to explain and discuss it with the Mauritius Government Officials concerned from July 4 to July 17, 1988. Both parties had a series of discussions on the Report and agreed to recommend to their respective Government that the major points of understanding reached between them, attached herewith, should be examined towards the realization of the Project.

July 13, 1988

Port Louis.

宇賀神 義宣

(Yoshinori Ugajin)
Team Leader
Japan International
Cooperation Agency (JICA)



(R.R. DOOKHONY)
Permanent Secretary
Ministry of Agriculture,
Fisheries and Natural
Resources

Mustaphan.

(J.H. Nagdan)
Director-General
Mauritius Marine Authority

ATTACHMENT

1. The Mauritian side was satisfied with the Draft Report in principle.
2. The Mauritian side understood Japan's grant aid system and the necessary measures to be taken by the Mauritian side as shown ANNEX II of Minutes of Discussions on the Project signed on April 8, 1988, on condition that the grant aid by the Government of Japan would be extended to the Project.
3. The Mauritian side stated that necessary budget will be prepared for the effective management, operation and maintenance of the facilities in line with the adequate number of Mauritian personnel.
4. The Mauritius Marine Authority under Prime Minister's Office will take responsibility for the effective management, operation and maintenance of the Fishing Port.
5. The Agricultural Marketing Board under Ministry of Agriculture, Fisheries and Natural Resources will be responsible for the effective management, operation and maintenance of the Cold Storage.
6. Both party confirmed that the Mauritian side, by its own budget, will carry out further dredging in addition to the area indicated in the Draft Report, if necessary.
7. The Mauritian side ensured to demolish or remove the building and structures in proposed site before implementation of the project.
8. The Final Report (10 copies in English) on the Project will be submitted to the Mauritian side by the end of September.

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