Part V
Lucena Fishing Port Development and Improvement Project

PART V LUCENA FISHING PORT DEVELOPMENT AND IMPROVEMENT PROJECT

Chapter 1 Basic Line of Development and Improvement

The Lucena fishing port development and improvement project will have to be implemented along the basic line stated in the following with due consideration of the present condition of marine products and their marketing in the Philippines and Lucena, situation of the landing site and the government policies and plans for promotion of the fishery industries discussed in Part I.

(1) The project should not remain merely in dissolving the shortage in the present facilities but be capable of coping satisfactorily with the prospected sharp increase in port demand in the near future. Consideratoin should also be made for the project to be also capable of coping with the great development prospected of the fishery thereafter.

(2) The Lucena fishing port will be so developed and improved that it will be able to exhibit its functoins as a pivotal fishing port for development of the fishery in the south-western area of Luzon.

(3) Consideration should be made for compliance, as much as practicable with the city development plan of Lucena.

(4) Reclamation of the land for fishing port facilities will be made economically in use of the dredged soil of the basin.

Chapter 2 Establishment of Project Targets

2-1 Project Target Year

For the basic facilities of breakwaters, mooring facilities, bulkhead and basins and functional facilities of road and land for fishing port facilities, the target year will be set at 2000 A.D.

For the other functional facilities such as fish market, sheds, ice plant and cold storage, water supply facility, full supply facility, fishing port administration facilities and fishing boats and engines repair shop, the target year will be set at 1990.

2-2 Planned Handling Amount and Fishing Boat Force

The planned handling amount of the catches and the fishing boat force in the respective target years will be as shown in Table 5-1.

Table 5-1 Planned handling amounts and fishing boat force

Target year	Planned Handling Amount of Catches	Number of Trawlers	Number of Basnigs
1990	58,000 tons	30 boats	112 boats
2000 AD	143,200	73	277

Chapter 3 Selection of Project Site

The fishing port construction site selected by the Government of the Republic of the Philippines corresponds to the fishing port area in the city development plan formulated by the Lucena City and is of the location shown in Fig. 5-2.

As the result of examination at the site, the Study Team considers this point to be an adequate project site from the reasons set forth in the following, and thus the projected fishing port will be located here.

(1) Presently, this site is used for the landing of catches from the fishing boat such as trawlers and the basings.

(2) There is a sufficient area available for construction of the fishing port.

(3) It is a seashore close to the central section of Lucena City.

(4) To the background of project site a road (two lanes, asphalt paved) is coming which leads to the central section of Lucena City.

(5) Electricity and water are obtainable with ease.

Note: For water, the service water of Lucena City will be used. The city water system of Lucena is now having an extension work executed, and it is planned to complete the piping to the fishing port project site by 1980.

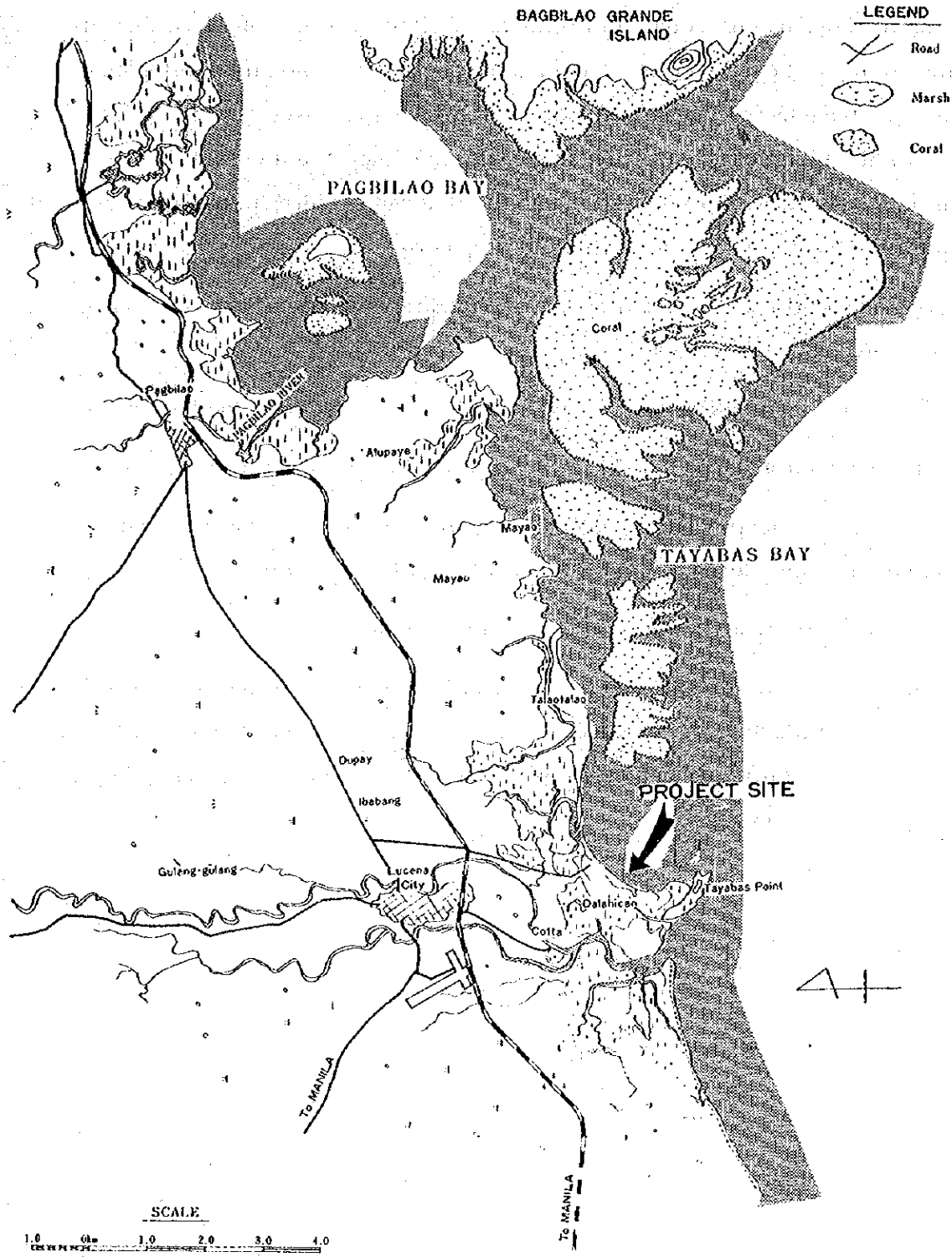


Fig. 5-1 Topographical Map of Lucena, Luzon

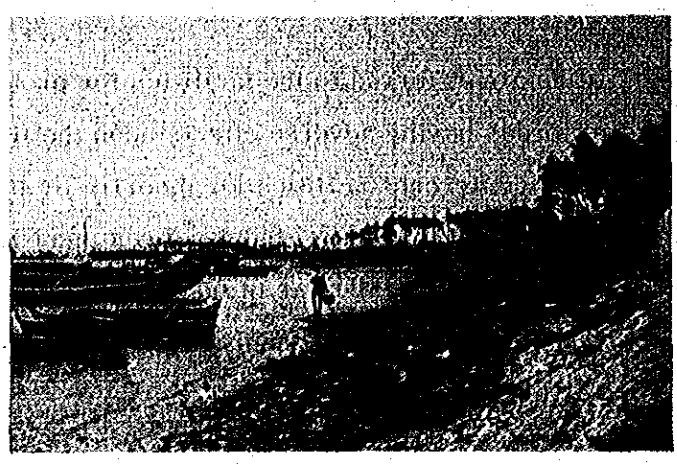


Photo 5-1 Lucena fishing port project site, seeting the west coast from the central fish market.

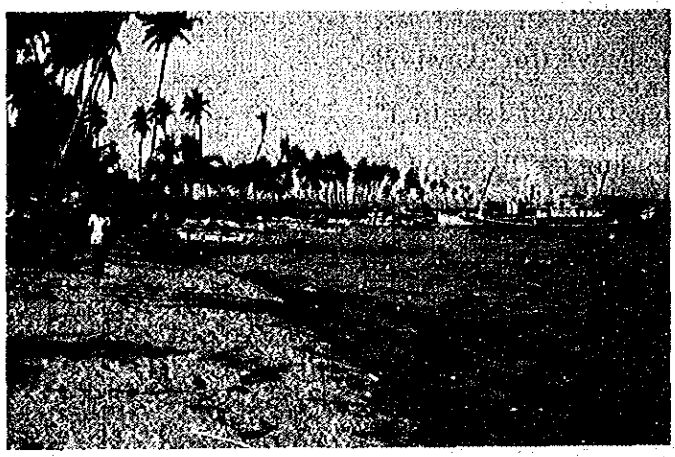


Photo 5-2 Seeing the east coast from the central point of the fishing port construction site.

Photo 5-3 Seeing the central part of the project site from the west coast.

Chapter 4 Plan of Basic Port Facilities

By the basic port facilities are referred to the facilities for protecting the fishing port from external forces having adverse effects upon the fishing port such as wave, littoral drift and current, facilities for mooring or landing the boats for the purpose of unloading the catches, supply of commodities or recess, and facilities for fulfilling the fundamental roles of the fishing port such as water surfaces allowing safe departure, return and anchorage or mooring of the fishing boats.

4-1 Project Facilities

Project facilities are as follows.

1. Mooring facilities
   - (1) Landing quays (for trawlers).
   - (2) Landing yard (for basnigs).
   - (3) Stair landing facility (for small fishing boats).
   - (4) Preparation quays (for trawlers).
   - (5) Preparation yard (for basnigs).
2. Breakwaters
   - (1) East breakwater.
   - (2) West breakwater.
3. Revetment (Rock Bulkhead)
4. Basins
   - (1) Anchorage basin (for trawlers).
   - (2) Anchorage basin (for basnigs).

4-2 Plan of Mooring Facilities

4-2-1 Plan conditions for mooring facilities

Planning of the mooring facilities will be made with the following plan conditions taken into consideration.

(1) The landing and preparation quays for the trawlers shall be of -4.0m quay.

(2) The landing facility for the basnigs shall be a slipway type mooring facility.

(3) The landing facility for small fishing boats shall be a -2.0m stair landing facility.

(4) The preparation quay for the basnigs shall be of -4.0m quay.

(5) Trawlers having the landing or preparation finished will anchor or moor in the east basin. Basnigs having the landing or preparation finished will anchor or moor in the west basin. Small fishing boats having the landing finished will use any adequate shore within or outside of the port.

4-2-2 Required length of the mooring facility

The required length of the respective mooring facilities shall be as given below.

1. Required lengths of the landing quay for trawlers and landing facility for basnigs.

The required lengths of mooring facilities are calculated as shown in Table 5-2

Table 5-2 Required lengths of the landing quay for trawlers and the landing facility for basnigs.

Kind of Fishing Boat	Planned Number of Boats. A	Number of Sailing Days. B	Standard Number of Fishing Boats. C	Hours of use per Boat per Landing. D
Trawler	73 boats	7 days	11 boats	1.7 hours
Basnig	27.7	1	222	0.85

Kind of Fishing Boat	Length of One Berth. E	Market open Hours a Day. F	Quay Sufficiency Rate.G	Required Length of Quay $(\frac{C \cdot D}{F} \cdot E)\ G$
Trawler	2.4m	6 hours	10.0%	≒ 75m
Basnig	23	6	80.0	≒ 580

Note 1) Standard number of fishing boats:
The standard number of trawlers using the facility a day shall be
73 boats ÷ 7 days = 11 boats/day.
The satndard number of basnigs using the facility a day shall be
277 boats × 0.8 = 222 boats/day.

2) Hours of use per boat per landing:
Calculation is

$$\text{Hours of use per boat per landing operation} = \frac{\text{Mean landing quantity per boat per opeation}}{\text{Landing capacity}} + \text{Extra hours, or}$$

$$\text{Trawler} = \frac{6 \text{ tons}}{5 \text{ tons/hr.}} + 0.5 \text{ hr.} = 1.7 \text{ hrs., and}$$

$$\text{Basnig} = \frac{4.9 \text{ tons}}{8 \text{ tons/hr.}} + 0.25 \text{ hr.} = 0.85 \text{ hr.}$$

3) Per berth length:
The trawlers are of the type of
Length, 20.6m; width, 3.9m; draft, 1.9m; and gross tonnage, 30 tons.
They are used alongside the quay so that the length of one berth is
20.6m × 1.15 = 24m.
The basnigs are of the type of
Length, 24.8m; width, 19.6m; draft, 1.9m; and gross tonnage, 20 tons.
They are used alongside the facility so that the length of one berth is
19.6m × 1.15 = 23m.

4) Quay sufficiency rate:
Days of use of the trawlers number about 300 a year so that the quay sufficiency rate is taken as 100%. Annual days (frequencies) of use of the basnigs are only 92 days (92 times) so that in consideration of economy, the quay sufficiency rate is taken as 80%.

2. Required length of the stair landing facility for small fishing boats.

The facility is to be used with the fishing boats laid alongside, and its length of extension shall be 100m.

3. Required lengths of the preparation quays for trawlers and basnigs

The preparation quay for trawlers is to be used with the boats lying alongside and shall be of about 4 berths, 100m.

The preparation quay for basnigs is to be used with the boats lying vertically and shall be of about 2 berths, 50m.

4-3 Plan of Breakwaters

4-3-1 Plan Conditions for Breakwaters

Planning of the breakwaters will be made with the following plan conditions taken into consideration.

In the vicinity of Lucena, NE and NNE wind is prevailing, and SW wind

is sometimes seen.

(2) The wave to be considered mainly at the fishing port project site is the diffracted wave of the water wave produced by the NE wind. Design objective wave at the scheduled points of construction of the breakwaters is, estimating from the wind data, of significant wave height $H_1/3$ = 1.5m and wave direction E-NE.

(3) The port entrance will be located at the trough present nearly at the central part of the fishing port construction area. The arrangement of port entrance will be so shaped as to reduce, as much as practicable, the wave entering into the port. The width of the port entrance will be 100m.

(4) The center lines of the breakwaters will be determined with due consideration given to the direction of design wave, water depth of the present ground and securing the basin area for the fishing boats moored in the bort.

4-3-2 Lengths of breakwaters

There will be installed an east breakwater, 870m, and a west breakwater, 1,250m.

4-4 Basins

The basin for the trawlers will have a required water area secured in the back of the east breakwater, and that for the basnigs in the back of the west breakwater. Practicularly, the basnigs have a occupancy area of about 500m^2 per boat, caused by their outriggers, and will thus require a mooring area of about 3,000 m^2 per boat at normal time or about 8,000 m^2 at strong wind.

4-5 Layout and Utilization Plan

Layout of the facilities specified in Sections 4-2 through 4-4 and the plan for the fishing boats to use them are as shown in Fig. 5-2. A detailed layout plan including the land functional facilities is illustrated in Fig. 5-5.

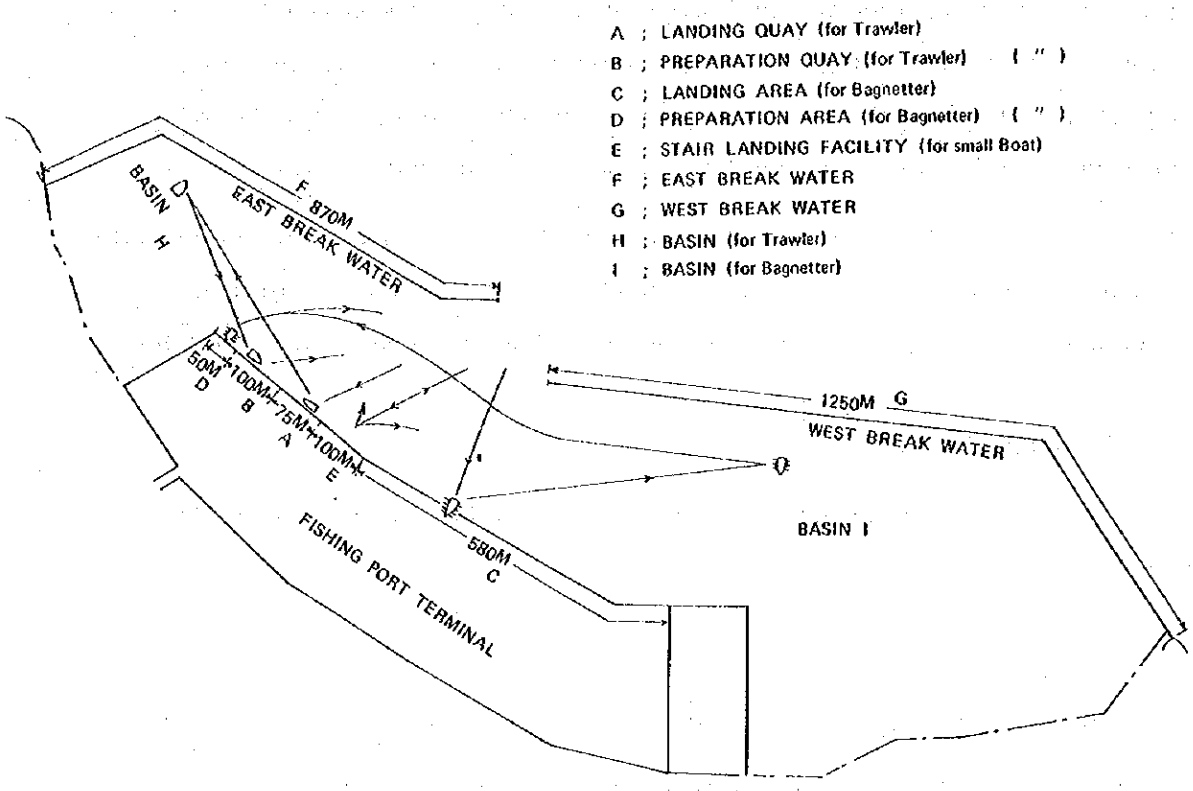


Fig. 5-2 Lucena fishing port basic facilities layout and utilization diagram.

Chapter 5 Plan of Functional Facilities

The functional facilities are referred to the facilities complementing the basic facilities and, at the same time, serving for reasonable execution of the works and services to be performed at the fishing port and thus enhancing the usefulness of the fishing port, and where the fish market and the ice plant and cold storage shall be constructed in the fishing port area, they are classified as one of the fishing port facilities.

5-1 Planned Facilities

Planned facilities include (1) fish market, (2) sheds, (3) ice plant and cold storage (4) water supply facilities (5) fuel supply facilities, (6) road, (7) parking area, (8) administration office, (9) fence and guardhouse, (10) power distribution and illumination facilities, (11) drainage system, (12) public toilet, (13) fishing boat and engine repair shop, (14) land for fishing port facilities and (15) aids-to-navigation.

5-2 Plan Conditions and Required Quantities of Functional Facilities

5-2-1 Plan conditions of functional facilities

Planning of the functional facilities will be made with the following plan conditions taken into consideration.

(1) The sheds shall be installed in the back of the landing place for the basning.

(2) The ice plant and cold storage shall be installed at a location as close to the fish market and also to the preparation quay for trawlers as practicable.

(3) For water supply, a water tank shall be installed which is connected to the service water system of the city and from which pipes are extended to the required places for supply of water.

(4) For fuel supply, fuel tank and fuel supply taps shall be installed, and the supply to the fuel tanks shall be made by tank lorries from the Zamboanga city.

(5) From the management requirement, there shall be constructed only one road which leads to the outside of the fishing port area.

(6) At the boundary between the land for fishing port facilities and the privately owned land, a fence shall be provided. At the boundary of the road leading to the outside, a gate and a guardhouse shall be installed.

(7) As fishing boat and engine repair facilities for major repair of fishing boats, slipway and dock equipment shall be provided.

(8) As the land for fishing port facilities, sites for the various functional facilities shall be created.

(9) Novigational aids shall be installed at the extreme ends of the east and west breakwaters.

5-2-2 Required sizes of functional facilities

1. Required sizes of main functional facilities (scale and capacity)

(1) Fish market

1) Standard amount of handling per day

Planned number of fishing boats is;

Trawlers ..... 30 boats
Basnigs ..... 112 boats } (A)

Standard number of landing fishing boats per day is;

Trawlers 30 ÷ 6 = 5 boats
Basnigs 112 × 80% = 90 boats } (B)

Standard landing quantity per day is;

Trawlers 5 boats × 6 tons = 30 tons
Basnigs 90 boats × 4.9 tons = 440 tons } (C)

2) Processing capacity per m^2 of fish market

Catches from trawlers 50 kg/m^2
Catches from basnigs 100 kg/m^2 } (D)

3) Required floor area of fish market

Catches from trawlers

(C) ÷ (D) = 30 tons ÷ 50 kg/m^2 = 600 m^2

Catches from basnigs

(C) ÷ (D) = 440 tons ÷ 100 kg/m^2 = 4,400 m^2

Total 5,000 m^2

4) Scale of fish market

Steel-framed,aluminium sheet roofing building of 40m × 125m. (5,000 m^2)

(2) Ice plant and cold storage

1) Ice plant

Supply of ice to fishing boats is of the same amount, for the trawlers, to the amount of catches landed per day. Use of ice at the fish market a day is 1/2 of the landed amount of catches.

Ice making capacity

30 tons × 1 + (30 + 440) tons × 1/2 = 265 tons/day

2) Ice storage

Storage amount of ice is equivalent to one day's production of ice or 265 tons (at -5°C)

3) Cold storage

Freezing amount a day 30 tons × 0.2 = 5 tons/day (E)

Cold storage amount (E) x 10 days stock

= 5 tons/day × 10 days = 50 tons (at -25°C)

(3) Water supply facility

Table 5-3 Water supply calculation table

Classification	Water Supply per Day	Water Supply per Hour
Supply to fishing boats		
Trawlers	2.52 t/boat × 5 boats = 12.6 t	55.8 t ÷ 6 hrs = 9.3 t/hr.
Basnigs	0.48 t/boat × 90 boats = 43.2 t	
Ice plant and Cold storage facilities	250 t	250 t ÷ 24 hrs = 10.4 t/hr.
Other use	24 t	24 t ÷ 12 hrs = 2.0 t/hr.
Total	329.8 tons/day	21.7 t/hr

Water is supplied from the city service water system, and a unit of pressure tank connected to the service water system shall be installed for supply of water through piping to the required places.

(4) Fuel supply facility

1) Fuel supply

Number of objective fishing boats of fuel supply (B)

Trawlers	5 boats
Basnigs	90 boats

Fuel supply per boat per time (F)

Trawler	7.246 kℓ/boat
Basnigs	0.251 kℓ/boat

Fuel supply per day

Trawlers

$(B) \times (F) = 5 \text{ boats} \times 7.246 \text{ k}\ell/\text{boat}$

$= 37 \text{ k}\ell$

Basnigs

$(B) \times (F) = 90 \text{ boats} \times 0.251 \text{ k}\ell/\text{boat}$

$= 23 \text{ k}\ell$

Total 60 kℓ /day

2) Fuel tank capacity

Stock of two days' requirement of fuel

60 kℓ/day x 2 days = 120 kℓ

For storage of fuel, a 200 kℓ tank shall be installed in the compound of the fuel tank, and the fuel shall be supplied to the fuel supply taps on the quays through piping.

Note: The fuel supply amount per boat per time is calculated as given below.

Table 5-4 Fuel supply amount per boat per time.

Classification	Trawler	Basnig
Fishing boat horse power	227 HP	220 HP
Main fuel consumption/ hr/HP	0.19 kg/hr/HP	0.19 kg/hr/HP
Average running hours/navigation/boat	7 × 24 = 168 hrs	6 hrs
Main fuel supply/ time/boat	7.246 kℓ/boat	0.251 kℓ/boat

2. Scales of the other functional facilities

(1) Shed (Catch transport vessel stock building)

There shall be installed a building with a floor area of 1,400 m^2.

(2) Road

The road within the area is of a width of 10m and shall be asphalt paved. The road shall be provided with drainages.

(3) Parking area

A parking space (asphalt paved) shall be provided in the back of the fish market and shed.

(4) Administration office

A reinforced concrete two stories building with a total floor area of 1,600 m^2 shall be constructed.

(5) Fence and guardhouse

There shall be installed an extension of 1,450m of fence, a gate and a guardhouse of a floor area of 50 m^2.

(6) Power distribution and illumination facilities

With the electric power supplied from the city, the power distribution lines within in the fishing port area shall be installed. Illumination lights shall be installed where they are required.

(7) Public toilet

Two toilet buildings, each with a floor space of 100 m^2, shall be installed.

(8) Fishing boat and engine repair facilities

A slipway of an extension of 72m, fishing boat loading equipment (rails, power winches, etc.) and land for repairing work shall be provided.

(9) Land for fishing port facilities

There shall be created about 21.5 hectares of land as the site for the foregoing functional facilities and the lot for fish processing, fish industry and net and gear area.

(10) Aids-to-navigation

A red light beacon shall be installed at the extreme end of the east breakwater, and a white light beacon at the extreme end of the west breakwater.

5-3 Layout Plan

Layout or arrangement of the facilities specified in Section 5-2 is as shown in Fig. 5-3 and 5-4. A detailed layout plan including the basic facilities is illustrated in Fig. 5-5.

LUCENA FISHING PORT

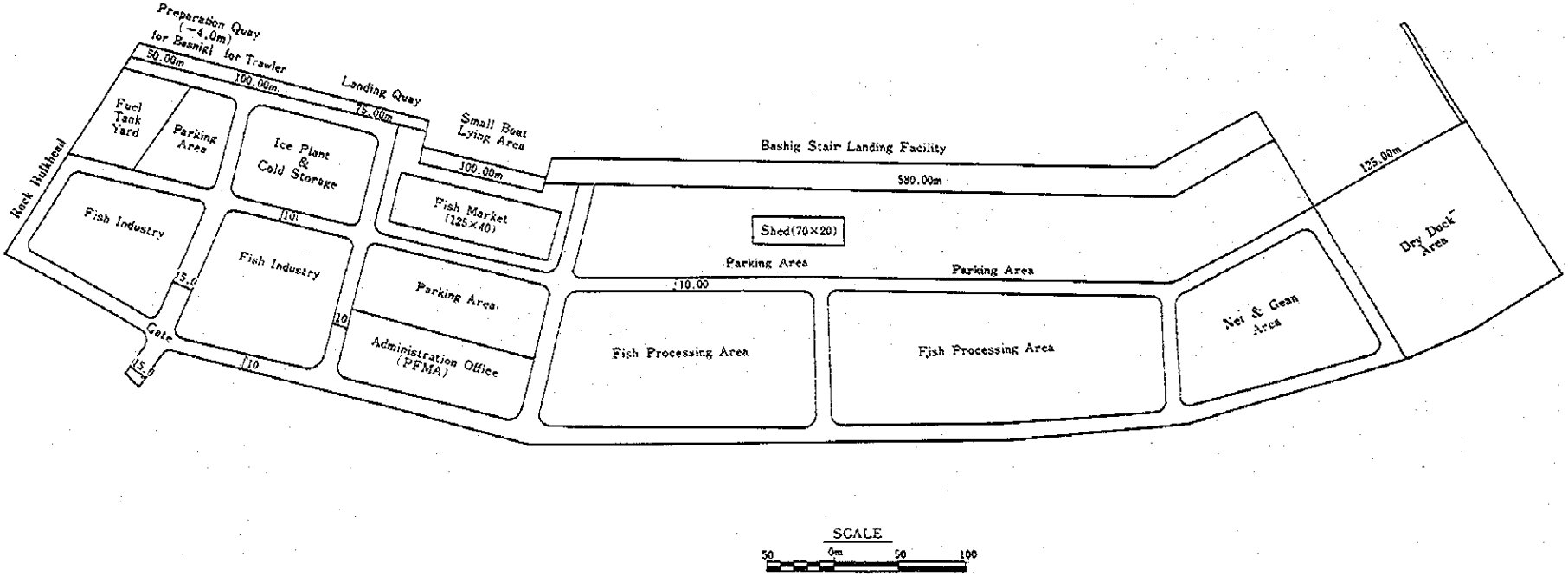


Fig. 5-3 Arrangement of Functional Facilities, Lucena Port

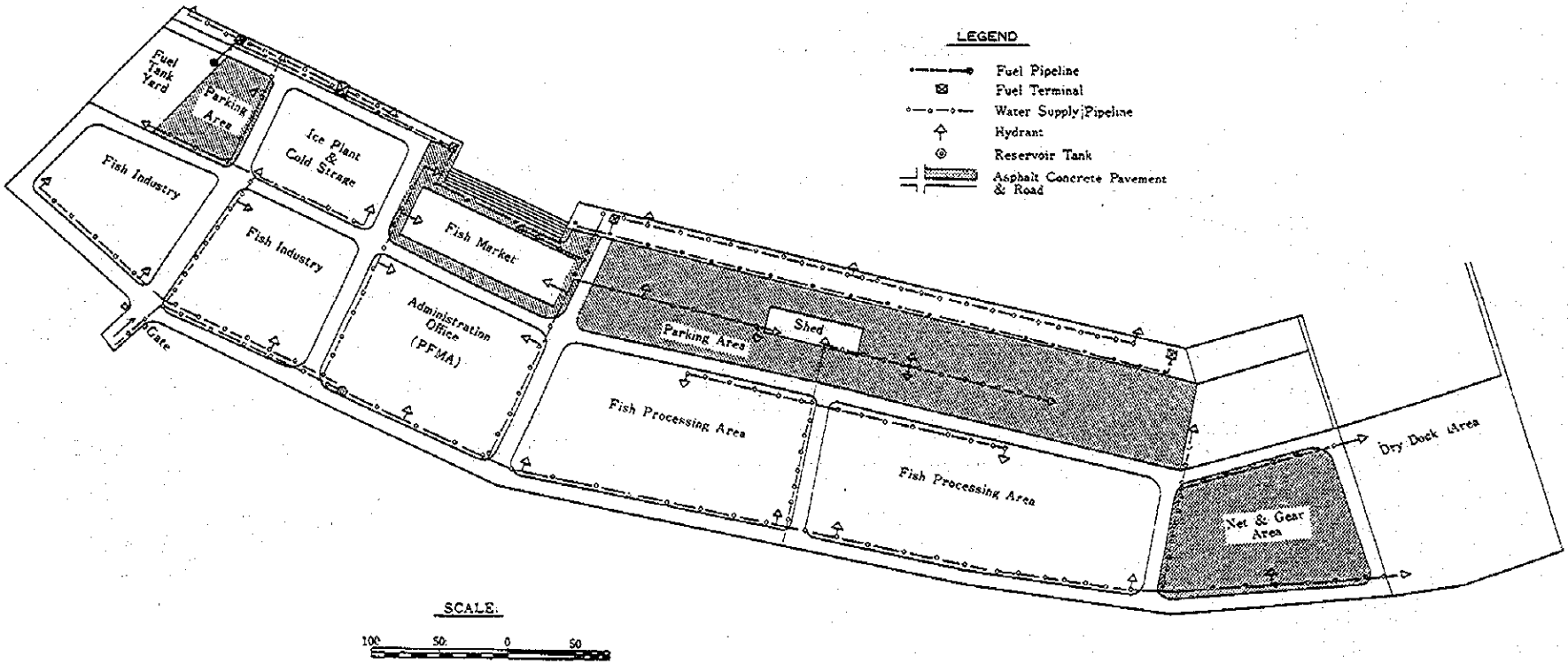


Fig. 5-4 Water and Fuel Supply System, Lucena Fishing Port

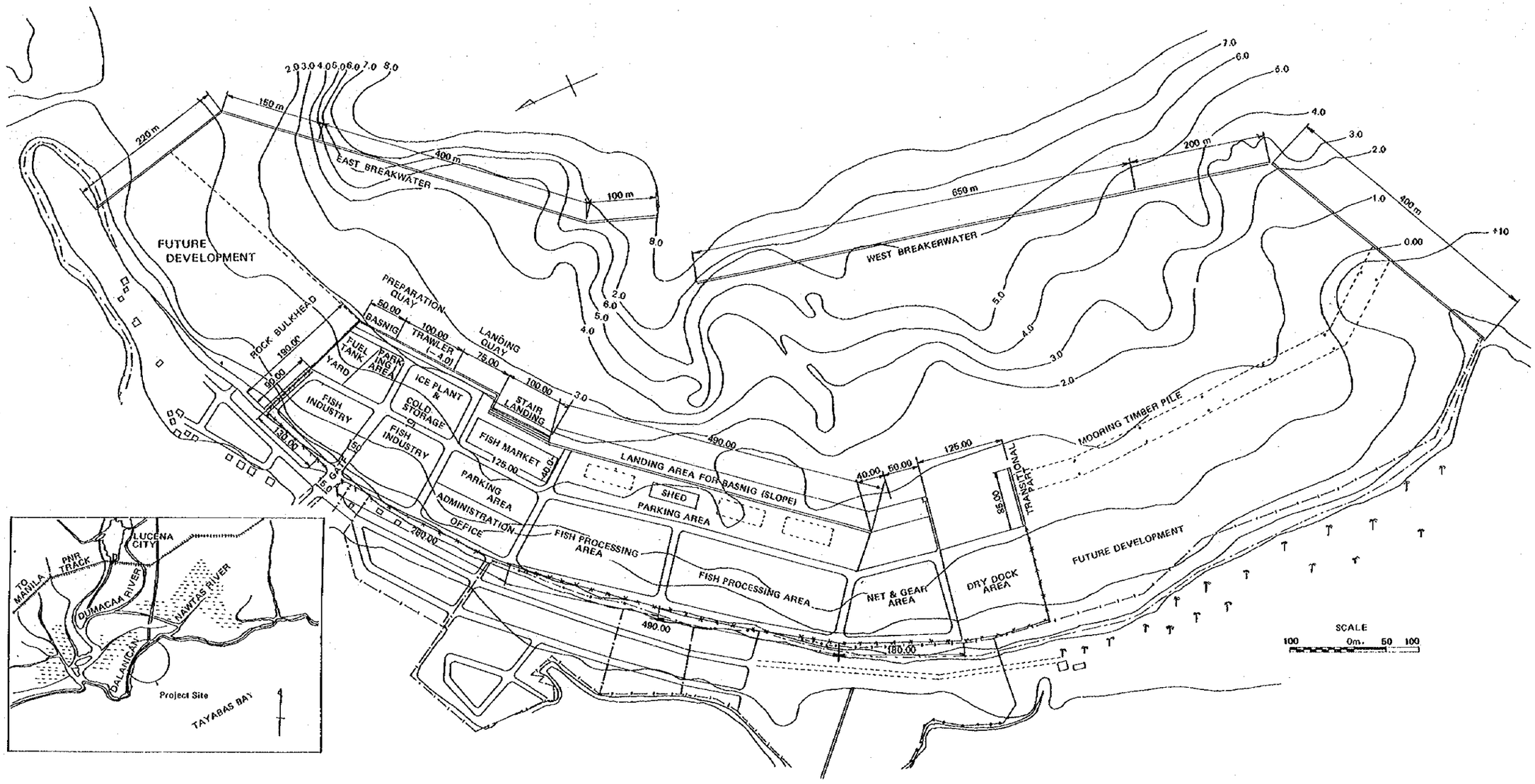


Fig. 5-5 Master Plan of Lucena Fishing Port

Chapter 6 Structural Design of Principal Facilities

6-1 Design Conditions

Design conditions used for design of quays and other principal facilities are summarized in the following.

(1) Design seismic intensity (Kh)

$$Kh = z.k.c$$

Where z: Regional seismic intensity (or z = 1.2) according to the "Seismic Data in the Philippines" shown in Fig. 5-6;

k : Structural importance coefficient (or k = 1.0); and

c : Seismic coefficient (or c = 0.1).

Then,

$$Kh = 1.2 \times 1.0 \times 0.1 = 0.12 \text{ or nearly } 0.1.$$

(2) Soil conditions

No soil survey was conducted at the site of construction so that with the soil survey data at the point (bridge building site) near the construction point taken as a reference, the soil condition was estimated as shown in the subsoil condition columnar diagram of Fig. 5-7.

(3) Objective fishing boat

The objective fishing boats are trawlers and basnigs, and their ship type parameters are as shown in Table 5-5.

Table 5-5 Type parameters of objective fishing boat.

Kind of Fishing Boat	Length Overall	Extreme Breadth	Draft	Gross Tonnage
Trawler	20.6^{m}	3.9^{m}	1.9^{m}	30 ^{tons}
Basnig	24.8	19.6	1.9	20

(4) Tide Condition

In the absence of the records of observation at the site, the design tide levels shall be determined as shown below from the "Tide and Current Table, Philippines" (published by the Bureau of Coast & Geodetic Survey) and the charts.

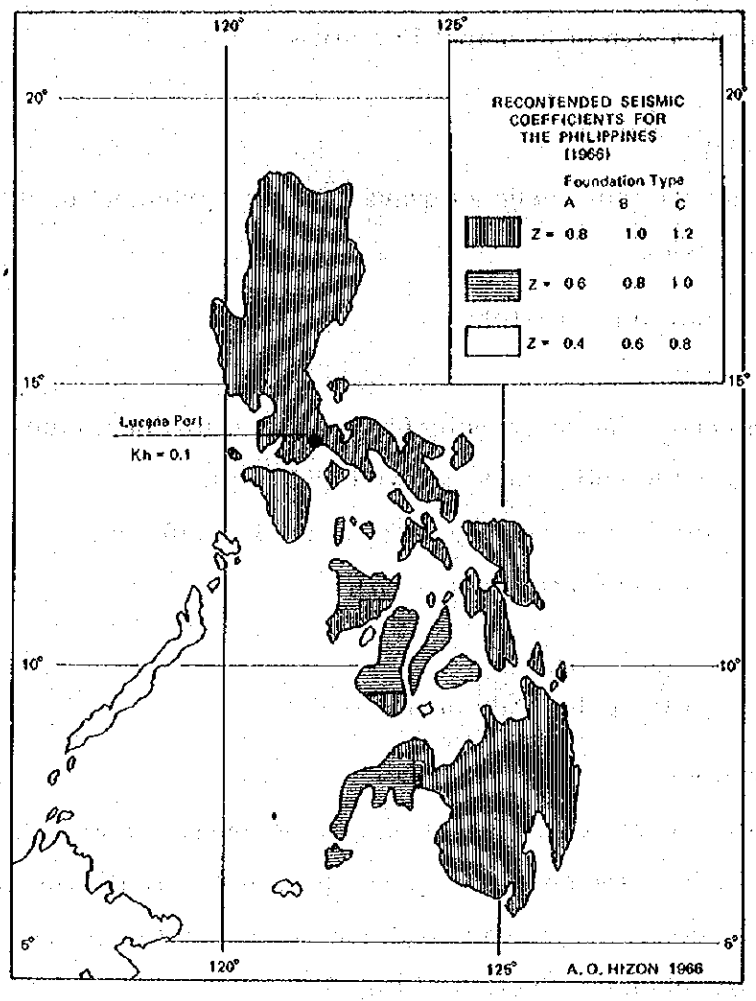


Fig. 5-6 Seimic Condition of the Philippines

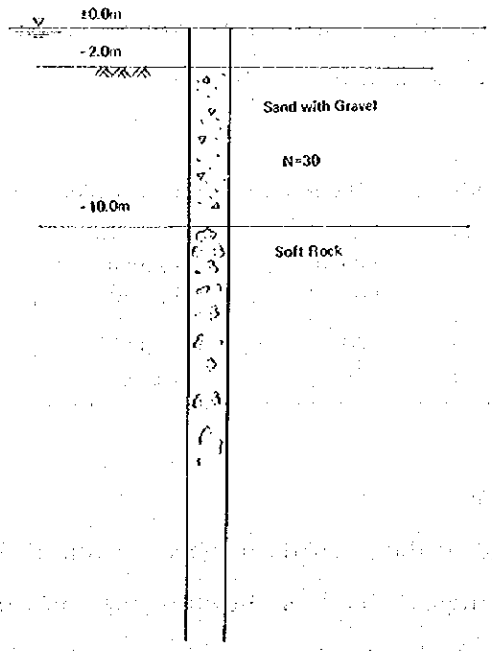


Fig. 5-7 Estimated Sub Soil Condition of Lucena Port

H.H. W. L. +1.530 m

H. W. L. +1.430 m

(1.250 + 0.18 = 1.430)

L. W. L. +0.210 m

(0.183 + 0.03 = 0.213)

The tide level information described on the charts is:

Lucena Port

H. H. W. (mean) 4·3/4 ft (1.45 m), and

Mean level 2·1/2 ft (0.76 m)

(5) Design wave height

In the absence of the records of observation of wave at the fishing port construction site, the design wave heights are estimated from the records of strong wind and wave invading conditions in the past as given below:

H_{max} = 2.0 m; and

$H_{1/3}$ = 1.5 m.

(6) Other design conditions

The other conditions considered for design are as follows.

1) Crown height

Quay and landing place	DL +2.5 m.
Revetment and breakwater	DL +3.0 m.
Reclaimed land	DL +2.5 m.

2) Design water depth;

Maximum draft of objective fishing boat (A)	1.9 m
Allowance (for a reef presumed to be present on part of the bottom)(B)	2.1 m
Design water depth (A) + (B)	-4.0 m

3) Surcharge load;

Quay	1.0 ton/m^2
Landing place and bulkhead	0.5 ton/m^2

4) Internal frictional angle of backing cobble $\phi = 30^{\circ}$

5) Property of bearing ground

Sand with gravels, N value at 30; with soft rock thereunder.

6-2 Selection of Structures of Main Facilities

6-2-1 Points noted in selection

In selection of the structures of the principal basic facilities, the following points are to be noted.

(1) Since it is required to complete the work in a short period and start the use as soon as practicable, such a structure should be chosen which is simple, of good workability and stabilized in a short time.

(2) The land for fishing port facilities shall be created entirely by reclamation with spoil so that it is required to construct sub-bulkheads in the water.

(3) The structure shall be chosen as to permit as much use of the construction machines presently available in the Philippines as practicable while use of special machines is avoided.

(4) The structure shall be so chosen as to permit as much use as practicable of the materials available at the site.

(5) The quays shall be of sheet pile structure, and from the workability, reliability and durability, steel sheet piles are to be used.

(6) The breakwaters shall be rubble mound breakwater to a depth of -4.5 m and block composite breakwater for the portion of further depth.

6-2-2 Structural elements of principal basic structures

Structural elements of the principal basic structures are as given below.

(1) -4m Quay .... Steel sheet pile structure (See Fig. 5-8)
Body .... Steel sheet piles (U-III type); ℓ = 11.0m; Embedment, -9.0m.
Tie rod .... Tie rod (III-ϕ30m/m).
Apron .... Effective width, 10.0m; Concrete pavement, with 20cm thick.

(2) -2m Stair landing facility - Concrete structure (See Fig. 5-9)
Body .... Concrete stair work.
Foot protection .... Precast Concrete blocks.

(3) Basnig landing .... Concrete structure (See Fig. 5-10)

Body .... Precast concrete slabs beneath the depth of ± 0.0 m.

In-situ concrete above ± 0.0m.

(4) Bulkheads (1) and (2) (See Figs. 5-11 and 5-12)

Body .... Rubble mound foundation (Used for bulkhead of reclamation work)

Concrete coping (with mooring bitts).

Apron pavement of a width of 5.5m provided in the back of the wall.

(5) Breakwater. 1 (Depth +1.5 ~ ±0.0m)(See Fig. 5-13)

Rubble mound breakwater (Slooping type)

Crown height	+3.0 m.
Crown width	3.0 m.
Armour rock	1,000 kg/piece; one layer.
Backfill rock	500 kg/piece; one layer; but front only.
Core rock	100 ~ 200 kg/piece.

(6) Breakwater.2 (Depth ±0.0 ~ -4.5m) (See Fig. 5-14)

Rubble mound breakwater (Slooping type)

Crown height	+3.0 m.
Crown width	3.0 m.
Armour rock	2,000 kg/piece; two layers; but surface side only.
Backfill rock	500 kg/piece; one layer; but surface side only.
Core rock	100~200 kg/piece.

(7) Breakwater.3 (Depth -4.5~-5.0m) (See Fig. 5-15)

Block composite breakwater (Composite Type)

Crown height	+3.0 m.
Crown width	3.0 m.
Body	Concrete blocks, two layers.
	Capping, in-situ concrete.

Rubble mound

Armour rock 2,000 kg/piece; two layers.

Core rock 100 ~ 200 kg/pice

(8) Breakwater.4 (Depth -5.0~-8.0m) (See Fig. 5-16)

Block composite breakwater (Composite Type)

Crown height +3.0m.

Crown width 3.0m.

Body Concrete blocks, three layers.

Coping, in-situ concrete.

Rubble mound

Armour rock 1,000 kg/piece.

Core rock 100 ~ 200 kg/pice

(9) Breakwater.5 (Extreme end part) (See Fig. 5-17)

Block composite breakwater

Crown height +3.0m.

Crown width 3.0m.

Body Concrete block, three layers.

Coping, in-situ concrete, serving also as the foundation for the beacon.

Rubble mound

Armour rock 1,000 kg/piece.

Core rock 100~200 kg/piece.

(10) Dry dock (See Fig. 5-18)

Body .... Concrete blocks beneath the depth of ± 0.0 m.

In-situ concrete above the depth of ± 0.0 m;

Length, 72 m; Width, 5.0 m.

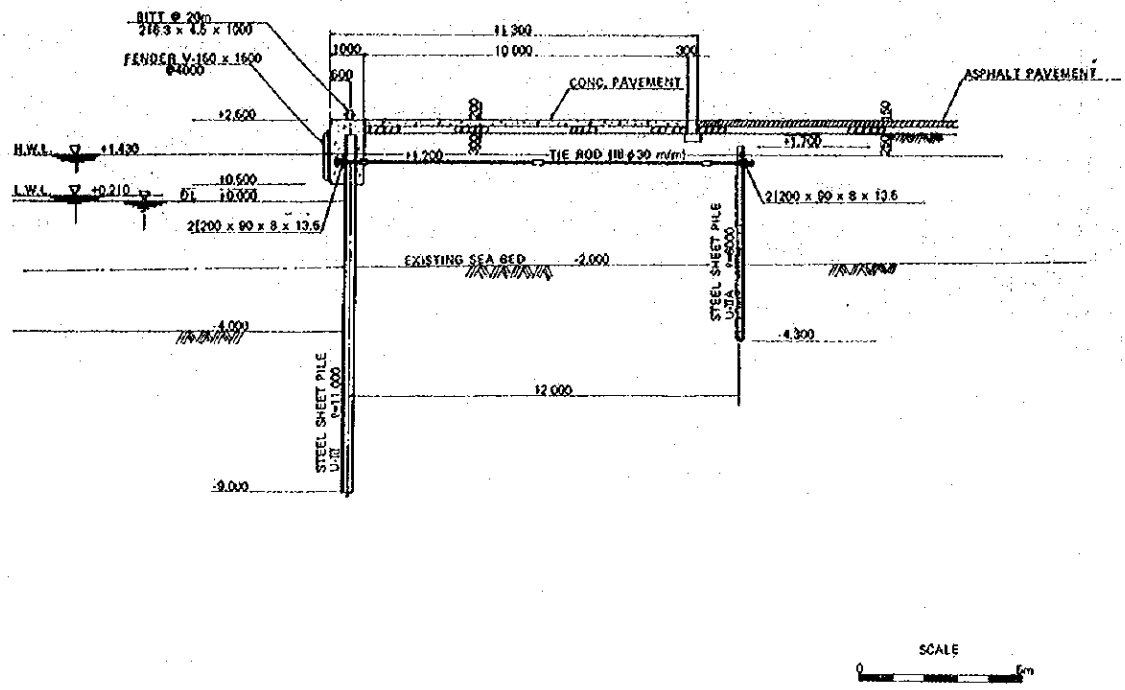


Fig. 5-8 Cross Section of Landing Quay – Lucena Port

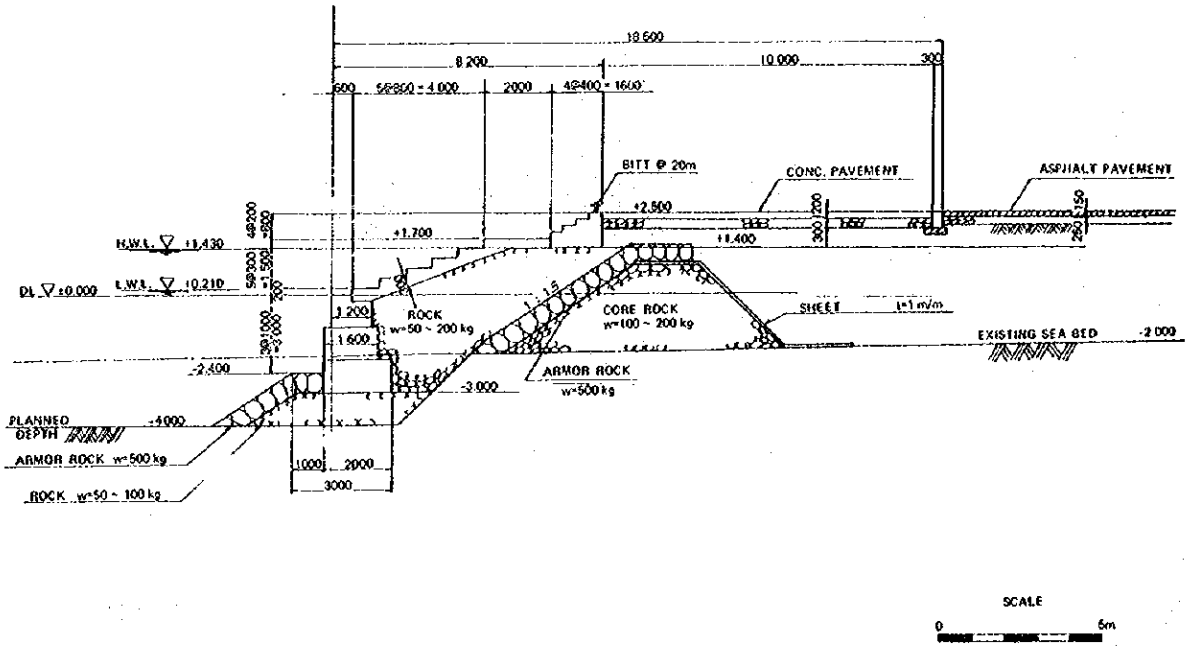
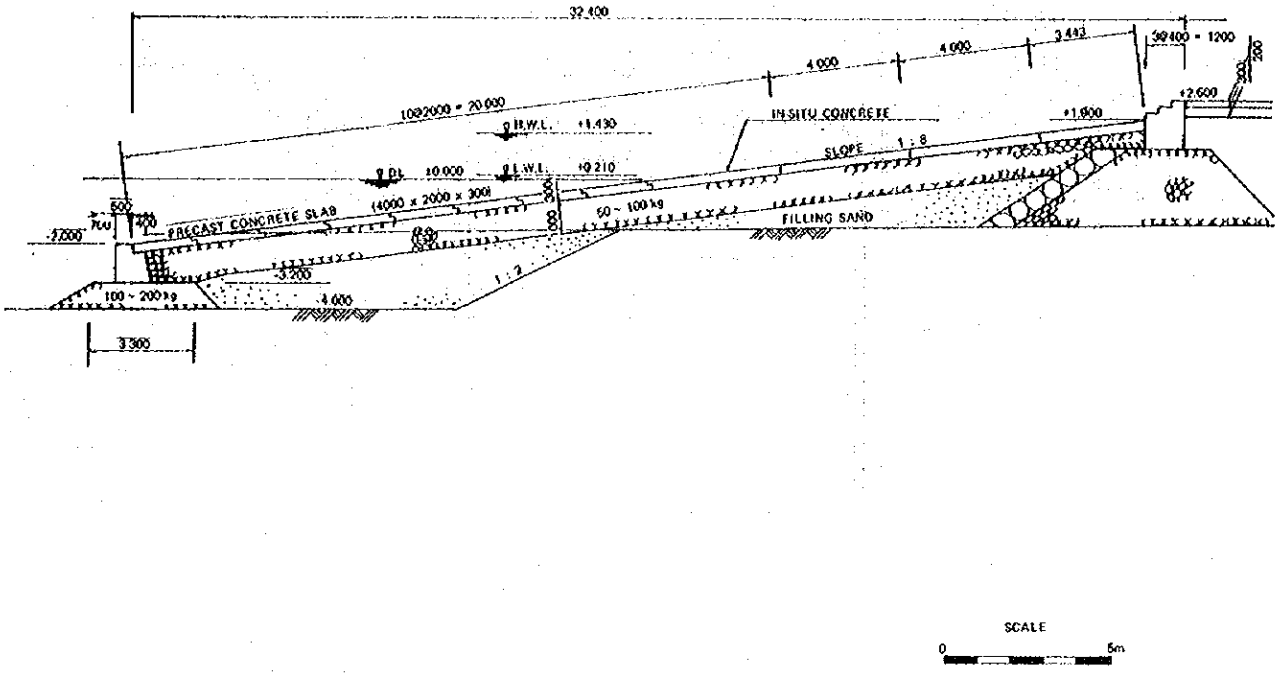


Fig. 5-9 Cross Section of Stair Landing – Lucena Port



Fig' 5-10 Cross Section of Basnig Landing -- Lucena Port

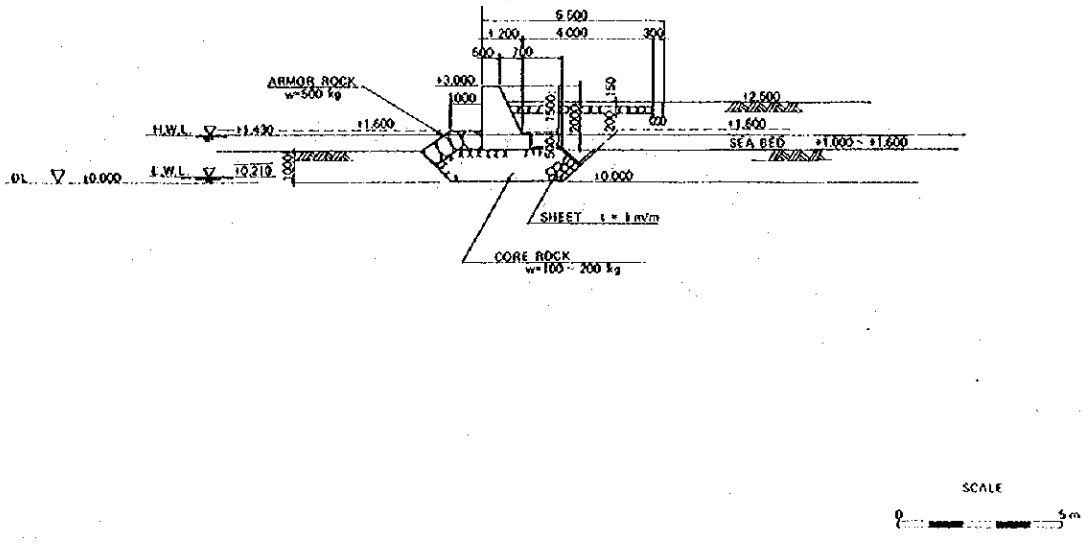


Fig. 5-11 Cross Section of Rock Bulkhead (1) -- Lucena Port

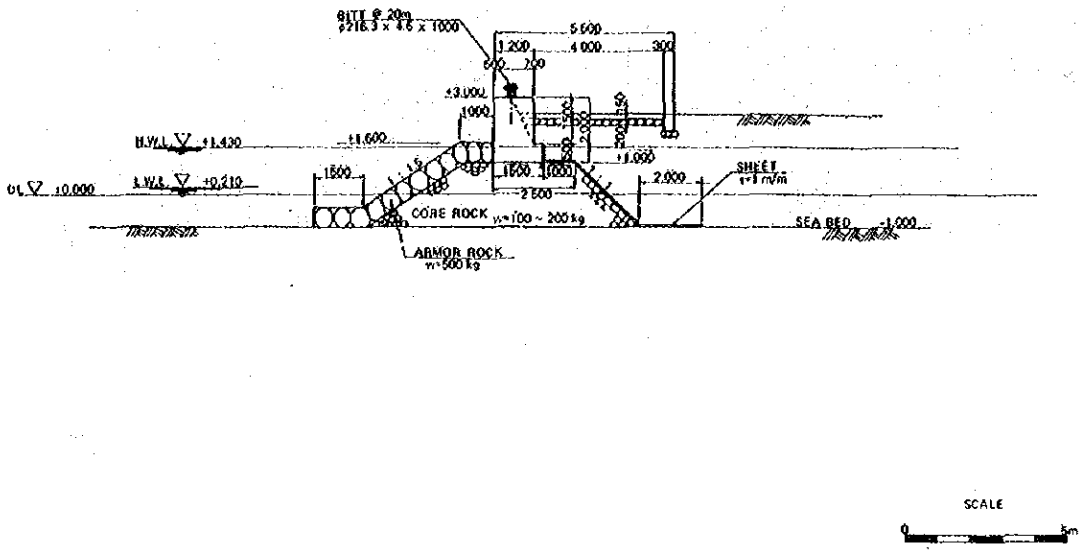


Fig. 5-12 Cross Section of Rock Bulkhead (2) -- Lucena Port

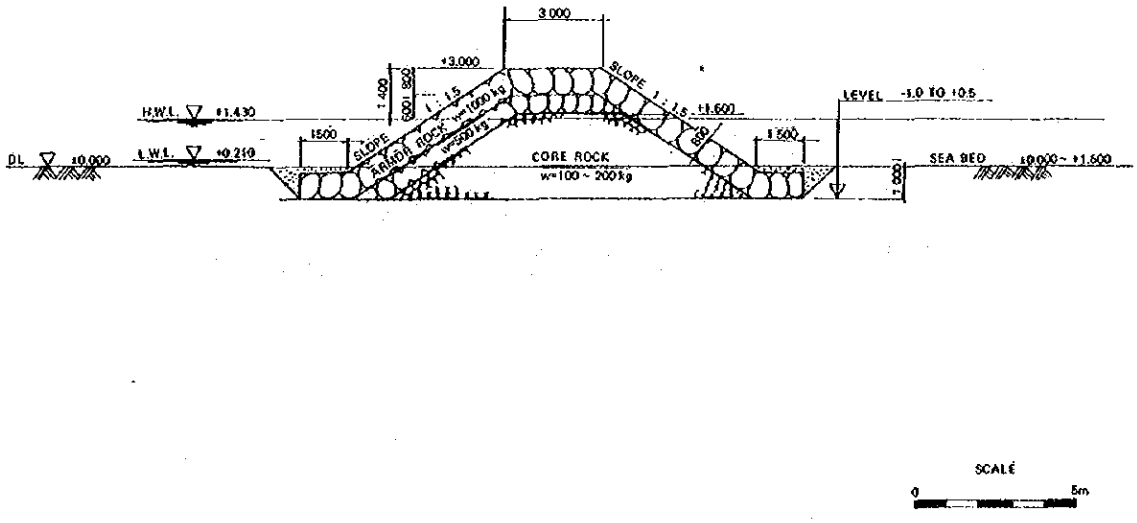


Fig. 5-13 Cross Section of Breakwater (1) – Lucena Port

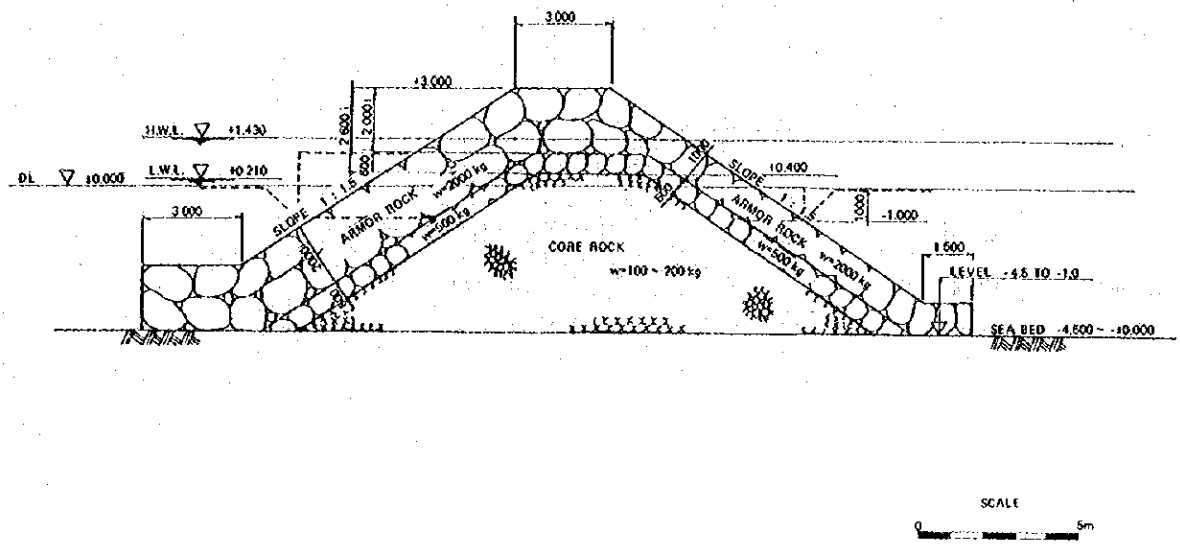


Fig. 5-14 Cross Section of Breakwater (2) -- Lucena Port

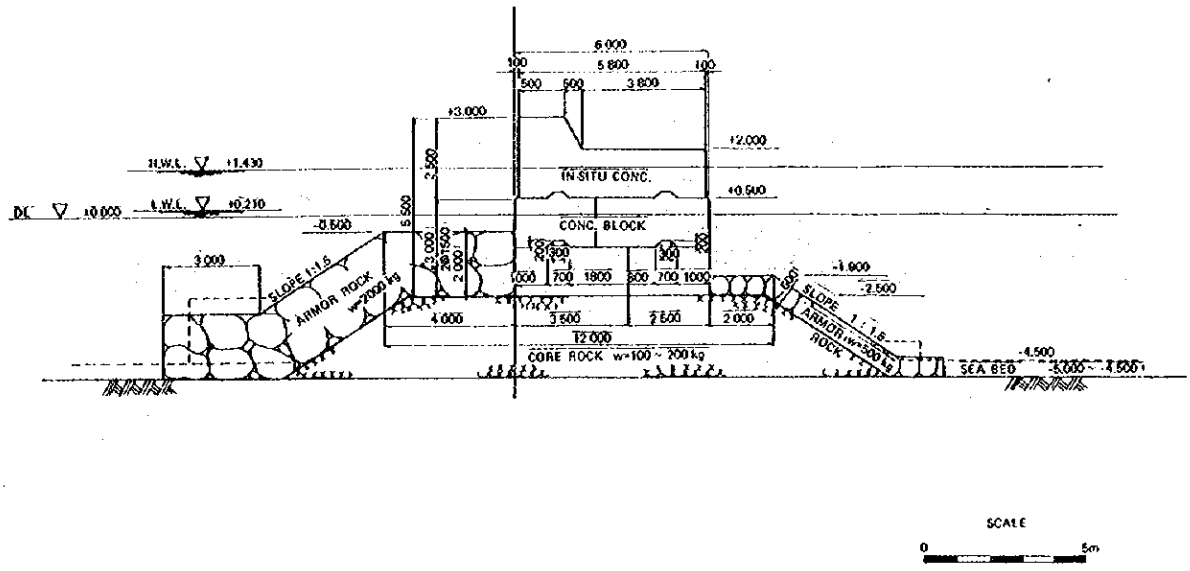


Fig. 5-15 Cross Section of Breakwater (3) -- Lucena Port

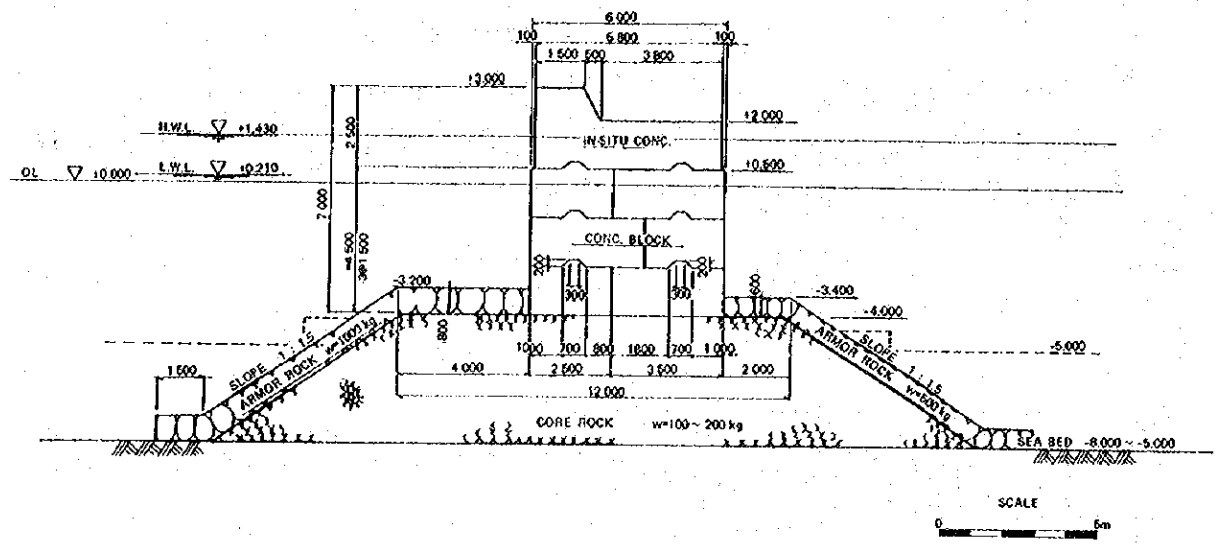


Fig. 5-16 Cross Section of Breakwater (4) – Lucena Port

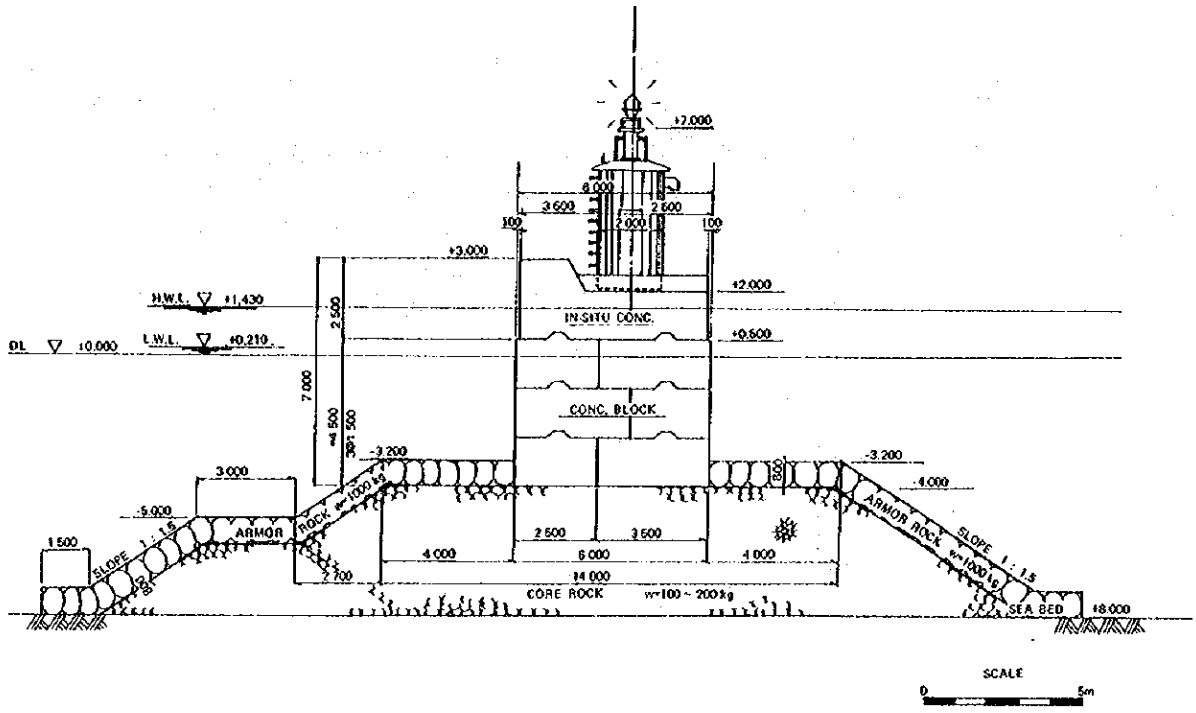


Fig. 5-17 Cross Section of Breakwater (5) – Lucena Port

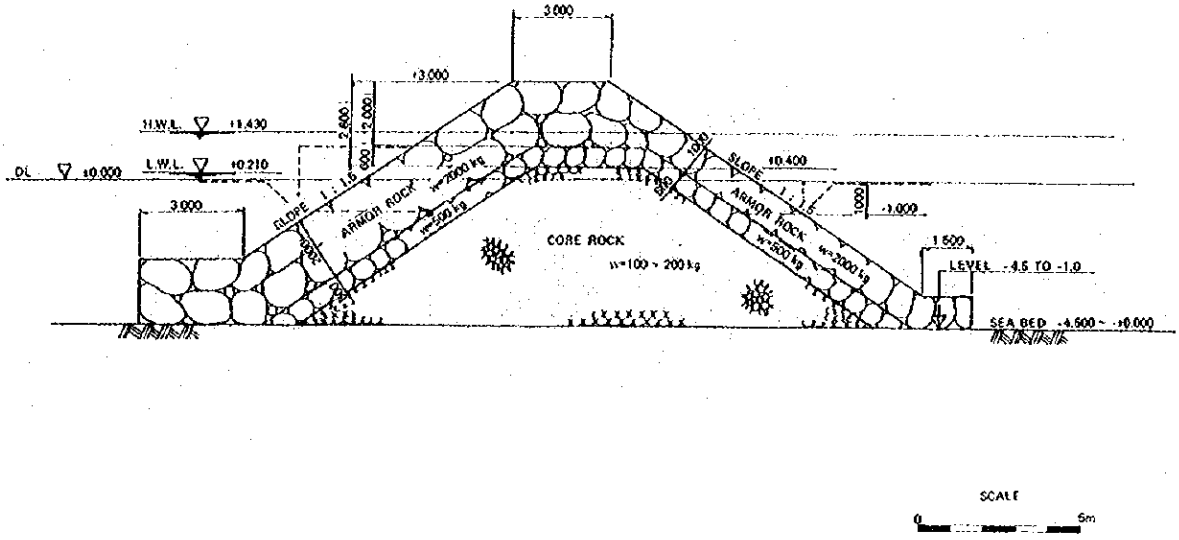


Fig. 5-14 Cross Section of Breakwater (2) -- Lucena Port

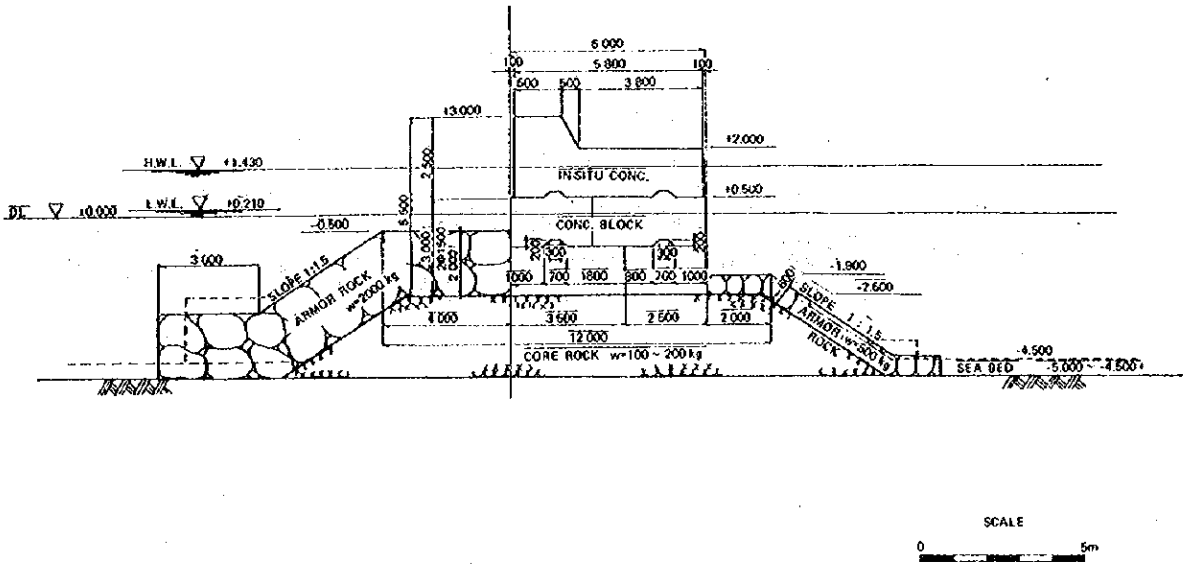


Fig. 5-15 Cross Section of Breakwater (3) -- Lucena Port

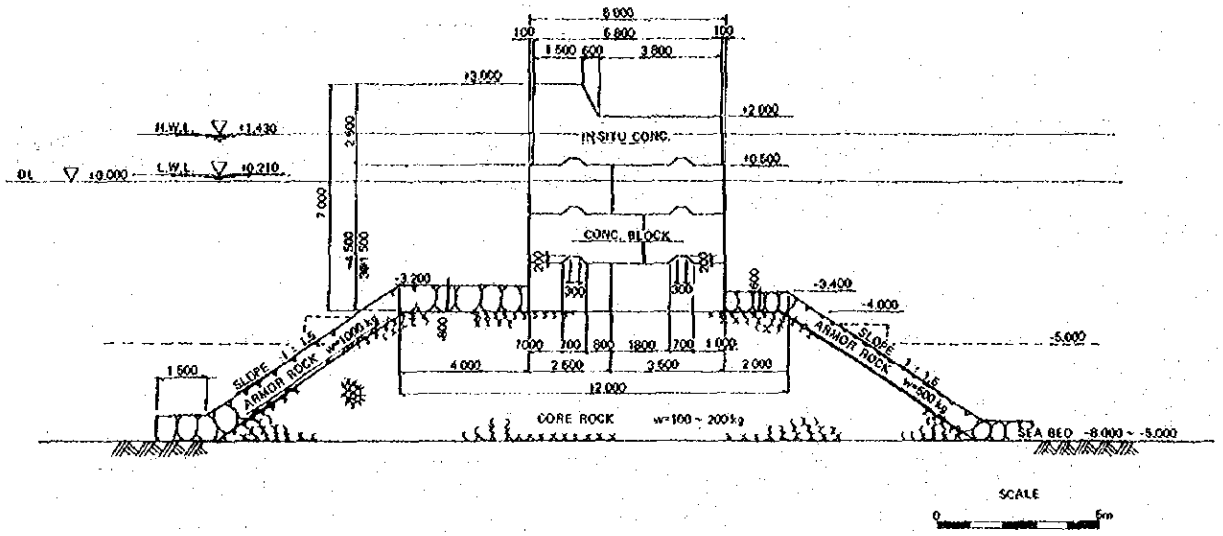


Fig. 5-16 Cross Section of Breakwater (4) – Lucena Port

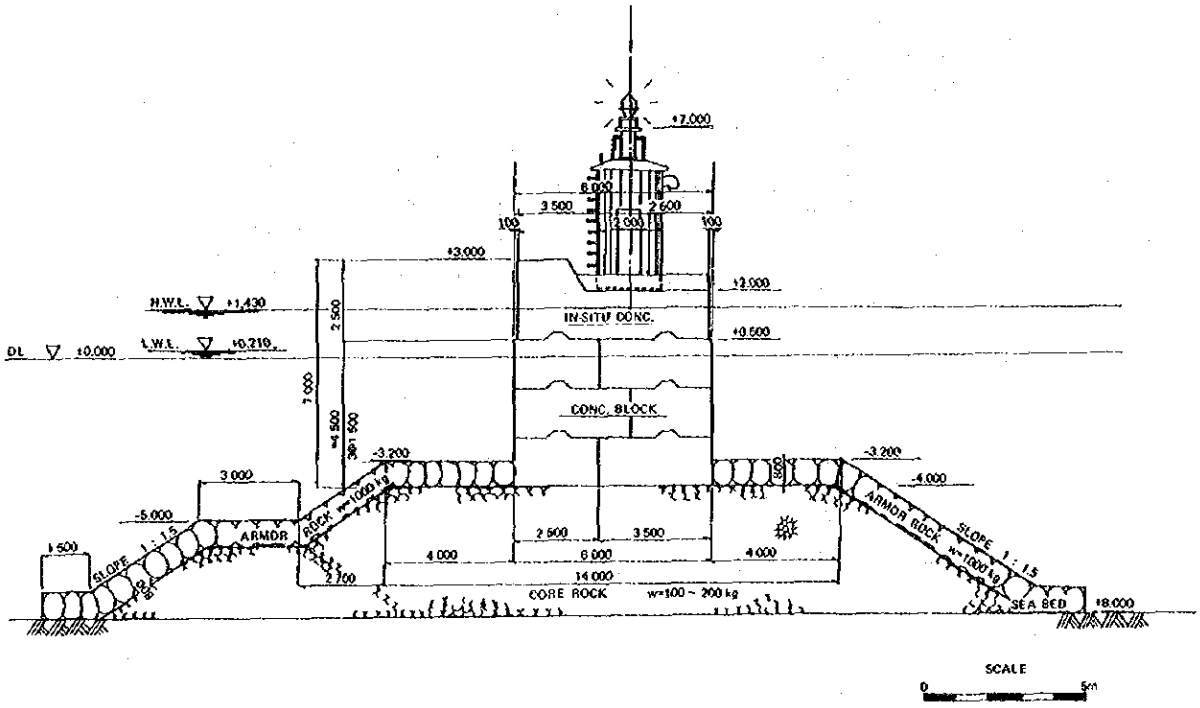


Fig. 5-17 Cross Section of Breakwater (5) – Lucena Port

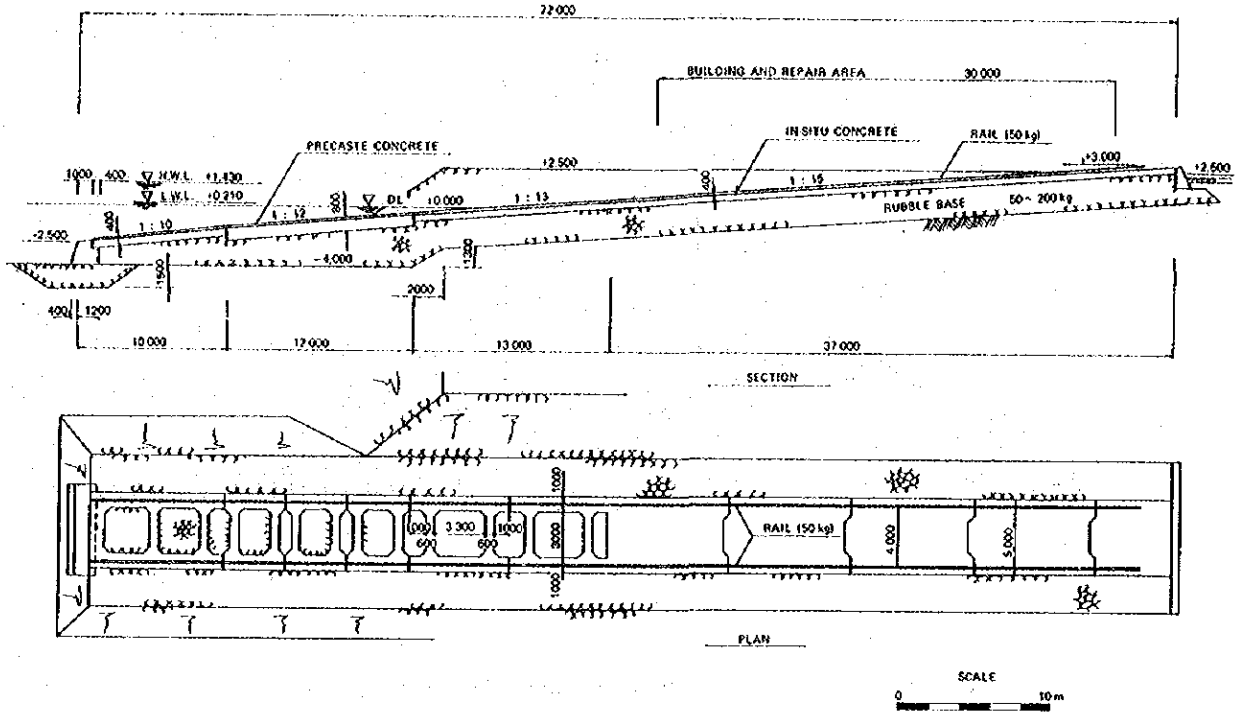


Fig. 5-18 Cross Section of Dry Dock – Lucena Port

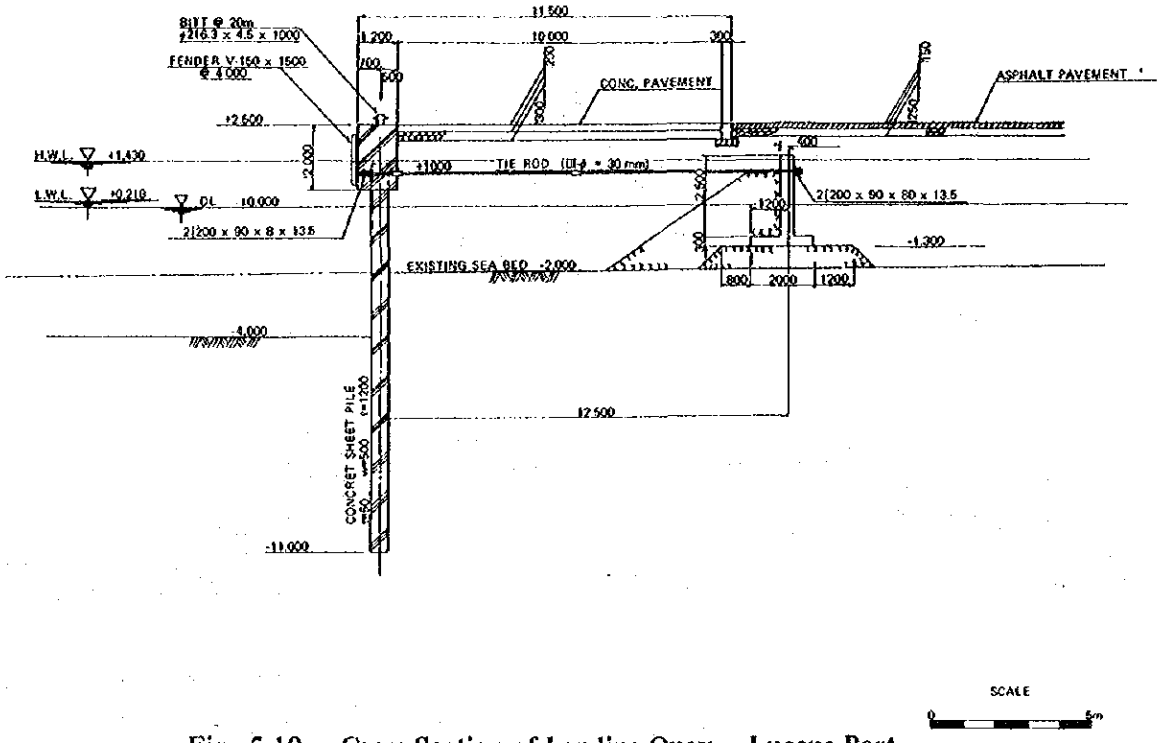


Fig. 5-19. Cross Section of Landing Quay – Lucena Port
(Using for Comparative Designing)

Chapter 7 Construction Program

7-1 Work Program

7-1-1 Principles

The construction program would be made with consideration given to the work schedule so that the work period being three years, the respective works are started as soon as practicable and that from the urgency of use of the facilities and the viewpoint of effective utilization of them, not only the basic facilities but the functional facilities can be placed in use soon.

Further, in implementing the construction program, consideration should be made so that the demand for facilities at the respective target years would be met satisfactorily.

Moreover, at the construction site, the catch landing and other works are actively carried out presently. Thus, it is required to give consideration to these activities so that they are as scarcely hampered as possible.

7-1-2 Securing workers for construction and procurement of materials and machines

(1) Securing the construction workers

The construction site is only 4 km apart from the central section of Lucena City so that it will be easy to secure unskilled workers. Also, it will not be difficult to secure the concrete workers and other skilled workers in the general works.

However, it will be difficult to secure the skilled workers in the port construction works, and they will have to be introduced from the other areas.

(2) Procurement of construction materials

For procurement of the important materials among the construction materials in general,

1) Core, backfill and foundation cobble

The Dumacao River running in the east of the Lucena City and the Iyam River running in the west of the city are rapids with a large amount of boulders on the respective beds to permit use as cobble for

Photo 5-4 Boulders deposited in the basin of Nabotas River. Optimum for rubbles used in the breakwaters.

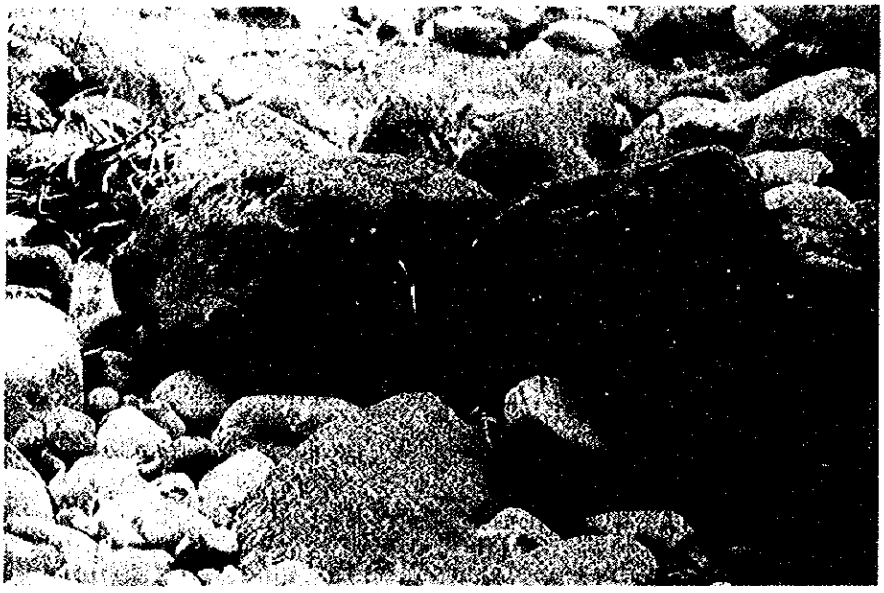


Photo 5-5 Good cobbles and gravels present aboundatly among the rubble stone (about 1 tonnage of weight)

the construction work. According to the survey of the Lucena City authority, the following materials are collectable directly from the beds in the amounts specified respectively. It is also confirmed that the materials are fed in a large quantity from the upper parts whenever there is a flood.

Boulder	185,000 m^3	(Quantity existing here and there on the surface near the road)
Gravel	100,000 m^3	(Quantity collectable without any extensive excavation)
Sand	120,000 m^3	

2) Sand and gravel for concrete

For the gravel, crushed stone in use of the boulders on the beds of said rivers are adequate in quality as well as quantity.

3) Backfill soil and replacement sand

The backfill soil is securable with ease in that a large amount of spoil produced upon dredging of the basin is used. The replacement sand has no problem involved in that said river sand is used, if the coast sand is not adequate for use as it contains silt.

4) Cement

Indigenous cement is used since its supply is stable and it has no problem in quality as well as quantity.

5) Steels

Steel materials such as steel sheet pile, tie rod and reinforcing bar are required to be of stable supply and uniform quality so that their supply will be dependent on imports.

6) Rubble stone

A large quantity of rubble stones are collectable from the basins of Nabotas and Nayon Ribers in Candelaria District which is about 25 km apart from the construction site.

Presently, both rivers are typical elevated rivers with the river bed higher than the land on both sides so that through use in a large quantity of boulders, a flood control effect is expectable. The boulders and rubble stones on the river beds are largely of a size of 1 ~ 3 tons and are basalt and other igneous rocks and are, therefore, of good quality.

7) Forms and supports

Wooden forms, supports and other temporary materials are all procurable domestically. Steel forms and steel supports are partly procurable domestically, but there is a problem in the supply capacity. Thus, their use will be limited to the important structures, and their supply will be dependent on the import.

8) Other special materials

Cables, electrical wires, electrical equipment, plants and machines will be dependent on the import.

(3) Procurement of construction machines

The following construction machines are obtainable in Manila City and its peripheral area so that they will be procured domestically:

(1) Pump dredger,
(2) Pile driving barge,
(3) Pontoons and pontoons for crawler,
(4) Dump trucks,
(5) Batcher plant, and
(6) Crushing plant.

The following machines will be imported from the outside of the country.

(1) Crawler crane,

(2) Vibro-hammers, and

(3) Generator and other special machines.

7-1-3 Facilities required for construction

(1) Temporary road for construction

At present, the road connecting the construction site with Lucena City is playing an important roll in transportation of the catches. Specifically, the part close to the seashore leads to the fish market so that it is congested particularly in the early morning. Therefore, it is preferable to provide a temporary road for construction work for a length of about 1 km for separation from the general road before it enters the Dalahican area.

(2) Temporary channel for construction

The seashore at the site of construction being shaoling, it is considered to be advantageous to construct, prior to other works, a temporary channel for introduction of dredgers and barges.

(3) Temporary stock yard and loading facility of the stone and other materials for construction

Rubbles, cobbles, gravels and sand are for the greater part collected in a large amount respectively from the rivers in the vicinity of Lucena City, introduced into and used at the construction site so that it is required for stock of them to provide a material stock yard having a considerable capacity.

Further, the greater part of rubbles are used in the works at sea so that it is required to install, prior to execution of the breakwater work, a stone material loading facility of an adequate scale. It is advantageous to provide a simple unloading place with steel sheet piles or a loading facility according to the end-on method with part of the stone materials used conveniently as the temporary jetty.

(4) Temporary office, etc.

With initiation of the work, it is required to construct a field office for the construction work personnel, warehouse, material yard and construction machine yard.

(5) Water, electricity and telephone facilities

These will have to be completed, before start of the work, from the city to the construction site by the hand of City or Government.

7-2 Project Schedule

The project schedule is illustrated in Table 5-6.

7-3 Estimation of Construction Cost

7-3-1 Concept for cost estimation

Estimation of the construction cost is made according to the following concept.

(1) Estimation of the construction cost is made on the 1978 prices.

(2) Unit prices of the construction materials and those of labours used in the estimation are determined with the Standard Material Unit Prices and Standard Labour Wages (1977) of the Government of the Republic of the Philippines taken as the base and the material unit prices and labour wages obtainable upon survey at the fishing port project site taken as a reference.

(3) For the imported materials, the unit prices are obtained at the price of CIF plus domestic transportation cost in 1978.

(4) Exchange rate of the local currency to the foreign currency is:

US$ 1.0 = 7.22 ₱
= ¥220.

(5) With no soil survey conducted at the construction site, a soil investigation will have to be conducted newly, and depending on the result of such soil investigation, the design conditions may change, involving a possibility of the design being modified more or less for the main structures. Thus, a contingency is estimated at a rate of 15% as physical contingency.

7-3-2 Estimation of construction cost

The construction cost required for development and improvement of the Lucena fishing port is set forth in Table 5-7.

Table 5-6 Project schedule -- Lucena fishing port

Completion Time 36 month

Item	Q'ty		Number of Months
			6 12 18 24 30 36
Mobilization	LS	1	
Port Work			
Landing Quay	m	255	
Stair Landing Facility	m	100	
Basing Landing	m	580	
Dry Dock	Set	4	
Rock Bulkhead	m	190	
Sub Bulkhead	m	85	
Breakwater	m	2,120	
Dredging & Reclamation	m^3	611,000	
Functional Facilities			
Building Work	LS	1	
Road & Pavement	LS	1	
Miscellaneous Work	LS	1	

Table 5-7 Construction cost of Lucena fishing port

	Unit	Quanty	Unit Price (US$)			Total (US$)		
			Local	Foreign	Amount	Local	Foreign	Amount
(Preparatory Work)						(157,250)		(157,250)
Site Clearance	m^2	75,000	0.23	0	0.23	17,250	0	17,250
Temporary Jetty	L.S	1				140,000	0	140,000
(Mobilization)	L.S	1				(123,000)	(302,000)	(425,000)
(Port Work)						(8,816,178)	(9,125,106)	(17,941,284)
Landing & Preparation Quay	m	255*)	433	3,899	4,332	110,415	994,245	1,104,660
Stair Landing Facility	m	100	1,626	1,278	2,904	162,600	127,800	290,400
Rock Bulkhead	m	190	473	357	830	89,870	67,830	157,700
Basnig Landing	m	580	2,776	3,007	5,783	1,610,080	1,744,060	3,354,140
Dry Dock	NOS	4	43,057	70,239	113,296	172,228	280,956	453,184
Sub-Bulkhead	m	85	421	317	738	35,785	26,945	62,730
Breakwater	m	2,120	3,003	2,265	5,268	6,366,360	4,801,800	11,168,160
Dredging & Reclamation	m^3	611,000	0.44	1.77	2.21	268,840	1,081,470	1,350,310
(Functional Facilities)						(6,007,376)	(2,999,041)	(9,069,417)
Fish Market	m^2	5,000	109.26	86.14	195.40	546,300	430,700	977,000
Transit Shed	m^2	1,400	109.26	86.14	195.40	152,964	120,596	273,560
Administration Office	m^2	1,600	606.98	0	606.98	971,168	0	971,168
Public Toilet	m^2	200	606.98	0	606.98	121,396	0	121,396
Roads & Pavement	m^2	98,855	27.07	0	27.07	2,676,005	0	2,676,005
Electrical	L.S	1				145,700	402,000	547,700
Drainage	m	6,480	46.07	0	46.07	298,534	0	298,534
Water System	L.S	1				359,400	119,900	479,300
Fuel System	L.S	1				82,700	391,300	474,000
Fence & Gate	L.S	1				45,300	0	45,300
Ice Plant & Cole Storage	L.S	1				670,909	1,534,545	2,205,454
Sub Total						15,166,804	12,426,147	27,592,951
Tax & Duties	L.S	1				1,906,975	0	1,906,975
Contingency	%	15				2,561,067	1,863,922	4,424,989
Total						19,634,846	14,290,069	33,924,915

Note: *) = Total length of 255 m includes 30 m of the transitional part of landing quay. Quay length of 100 m is used as preparation quay for Trawlers and 50 m is preparation quay for Bagnetters.

Chapter 8 Economic Analysis

8-1 Economic Background of Lucena Fishing Port

The Lucena Port is a fishing port close to the central city of Quezon Province, Lucena. Fishing boats using this port are bagnetters using the seashore projected for construction of the fishing port as a landing place and trawlers utilizing the Cotta commercial port. This fishing port is located at several hours drive along the highway to Manila City which is a large market and thus occupies an important position, along with the Navotas fishing port, as a source of supply of proteins to the metropolitan area.

The Lucena fishing port is located advantageously over the Navotas fishing port in that it is close to the rich fishing grounds. Thus, with advancement in the efficiency of the landing and handling of catches and supply of the fishing materials, there is a possibility of rapidly developing into the fishing port next to Navotas. Further, in the vicinity of the project site, relatively rich fishing villages are situated, and deals of fishes are carried on actively.

However, because of the shoaling seashore, the landing fishing boats are not able to approach the seashore beyond the point about 80 m to the seashore at high tide and have to stay about 300 m apart from the seashore at low tide, resulting in inefficient and uneconomical activities with the fishes transferred into smaller boats and carried to the seashore by manpower. During carrying the fishes, they often drop these fishes into the water, while a number of people gather in the water to carry off the fishes illegally. Thus, a considerable amount of fishes are lost in the course of carriage from the place of stay of the fishing boats to the fish landing place. Further, with repetition of the transfer, there is occurring damage to fish bodies. Thus, the time loss and quantitative as well as qualitative damage to fishes are by no means negligible.

In the economic evaluation, it will be clarified, with importance attached to the foregoing local characteristics, in what form the fulfilment of the demand for fishes intended by the Government of the Republic of the Philippines is achieved, and from the economic point of view, what effect will be brought about, by the fishing port

development and improvement.

Benefits from a fishing port are generally summarized as set forth in the following:

(1) Reduction of the time required for the fishing boats to come in and go out of the port through relief from congestion in the port;

(2) Increasing catches with increasing expedition of the fishing boats;

(3) Improvement in the freshness of fishes through increasing supply of ice and technological innovation;

(4) Realization of powered and larger fishing boats upon completion of a modern and larger scale fishing port (modernization of the fishery by functional accumulation);

(5) Increasing income of fishermen due to elevation of the average fish prices;

(6) Improvement in the rate of self-sufficiency of proteins;

(7) Stabilization of the fish prices from stable supply of fishes;

(8) Creation of employment opportunities and urbanization effect; and

(9) Acquisition of new techniques, and acceleration of the fishermen association.

The analysis will be made mainly with respect to the benefits (2) and (3) which permit quantifying among the benefits listed above.

8-2 Demand and Supply of Fish in Quezon Province

8-2-1 Market territory and recent outputs of and demands for fishes

The largest markets of the Lucena fishing port are the Lucena City and Manila City. But, here, the discussion will be made with the market territory of the Lucena fishing port restricted to the Quezon Province.

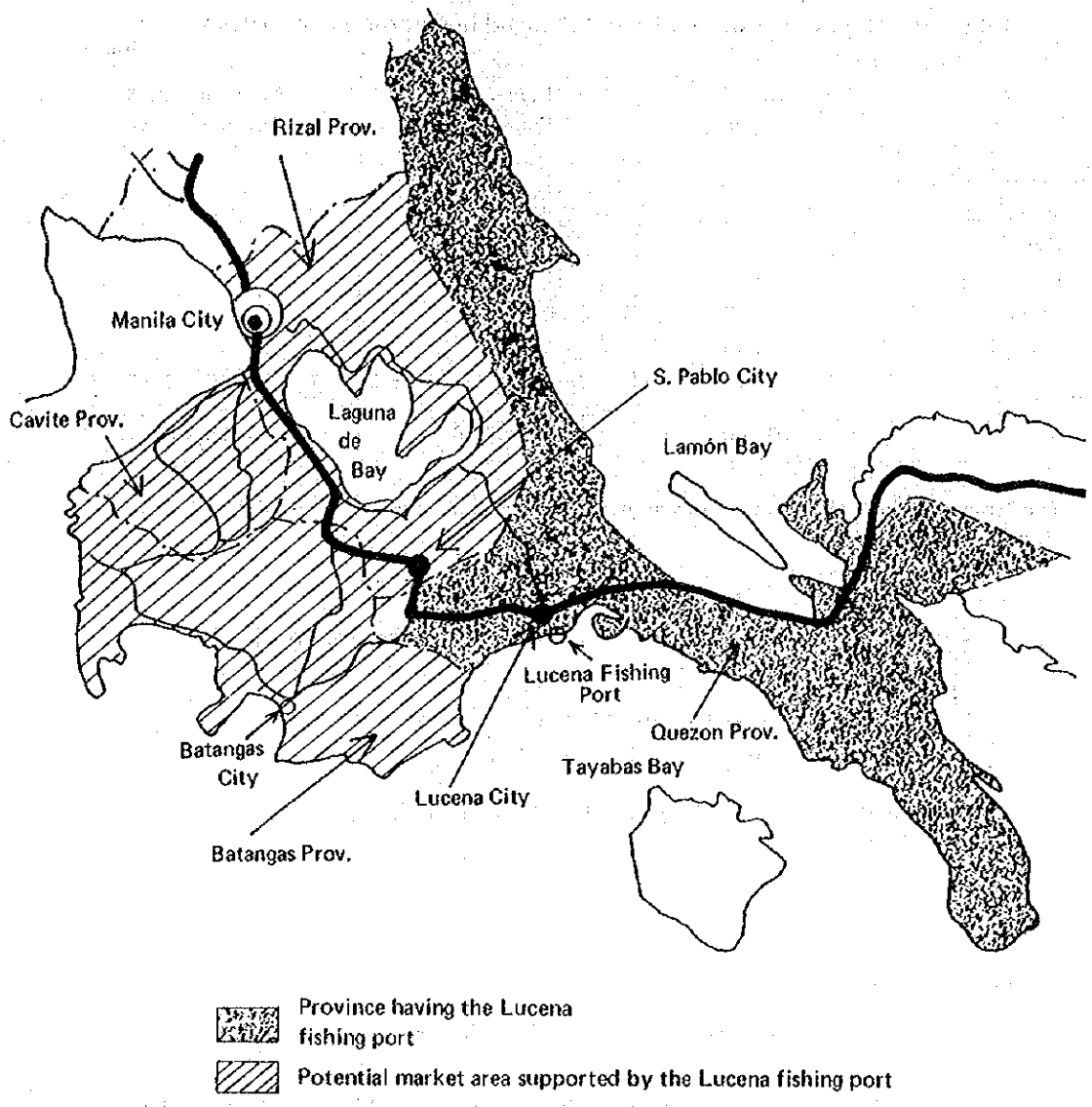


Fig. 5-20 Objective market territory of Lucena fishing port

The outputs and demands of fishes in Quezon Province in 1977 are represented in Table 5-8. The marine fishing activities are comprised, for the quarter part, of commercial activities (or 92% of the whole marine fishery) and thus have a potentiality to come out of the self-sufficient fishery and develop into a modern fishery. The demand in the province is well over the supply, suggesting domestic import of fishes from the other provinces rather than domestic export to the other provinces. (Here, when the shipment of fishes to Manila City is taken into account, the shortage in supply is substantial.)

Table 5·8 Details of fish supply and demand in Quezon Prov. (1977).

tons

	Annual output	Demand in the province	Net Domestic & foreign exports
1. Marine fisheries			
Municipal fisheries	1,200		
Commercial fisheries	14,600		
Sub Total	15,800		
2. Inland fisheries	4,700		
Total	20,500	39,300	▲18,800

Note: The demand in the province was obtained, with the 1977 population of 1,150,000 used, according to the formula

$$D_n : Co(1 + y\,e)^n \cdot Pn$$

where D_n : Effective demand in the n-th year with 1975 taken as a base year;
C_o : Basic consumption in the reference year (32.6 kg);
y : Real per capita income growth rate (6%);
e : Income elasticity of demand for fish (0.4); and
P_n : Population of the n-th year (with 1975 as the base year).

8-2-2 Analytical conditions

The analytical conditions are considered as follows.

(1) The output of the municipal marine fisheries will continue to maintain the present level.

(2) The inland fisheries will have no increase in the output but continue to maintain the present level.

(3) Assuming that there are increasing domestic export to Manila City and foreign export and no inflow from the outside of the province, the net outflow rate is taken at 40% of the total output (domestic export to the other provinces including Manila City at 30% and foreign export at 10%).

8-2-3 Analysis of the change in the balance of demand and supply

Under the foregoing present situation and analytical conditions, analysis of

the balance of demand and supply in the future (for the two cases with and without the fishing port) is made according to the following procedures.

(1) Forecast of population

Populations in the future are forecasted, upon the pattern of change of the population in 1960 - 1975, as shown in Table 5-9 and Fig. 5-21.

Table 5-9 Traditional change and forecasted values of population in Quezon Prov.

Unit: 1,000

Area \ Year	1960	1970	1975	1981	1990	2000
Lucena City	49	77	92	120	180	240
Other area	605	906	1,019	1,100	1,220	1,330
Total	654	983	1,111	1,220	1,400	1,570

Note: Source (Data from 1960 ~ 1975)
1) "The regional 5-10 year plan, Southern tagalog region, 1978-82-87", reginal development council, NEDA, 1977
2) "Socio economic and physical profile" Lucena city, 1977

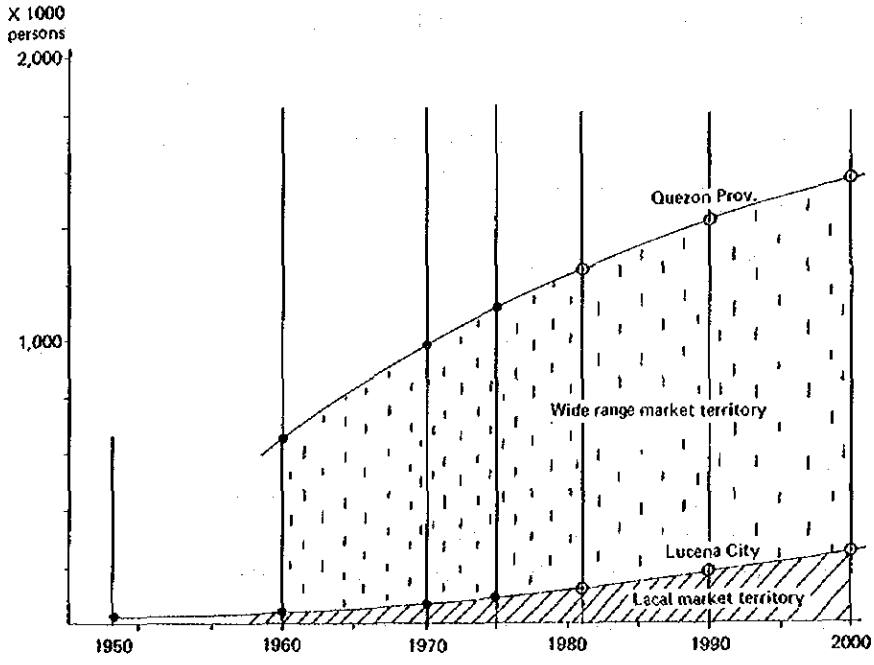


Fig. 5-21 Population change and forecast.

(2) Forecast of demand for fishes in the province

Demand forecasts of the objective market territory (Quezon Province) are, if the forecast is made for the local market territory (Lucena City) and for the wide range market territory (whole area of Quezon Province except Lucena City), as shown in Table 5-10.

Table 5-10 Demand forecasts of fishin Quezon Prov.

tons

Market territory / Year	Local market territory	Wide range market territory	Objective market territory
1975	2,999	33,220	36,219
1981	4,511	41,346	45,857
1990	8,374	56,754	65,128
2000	14,154	78,434	92,588

Note: The demand forecasting method is the same to that for Table 5.8.

(3) Balance of demand and supply in the province

The balance of demand and supply with a fishing port and that without a fishing port are shown in Table 5-11.

Table 5-11 Balance of demand and supply in the province.

tons

Project	Year	Supply (S)	Demand (D)	S/D
With port	1990	38,300	65,100	0.59
	2000	89,500	92,600	0.97
Without port	1990	14,300	65,100	0.22
	2000	14,900	92,600	0.16

Note 1. Supply (S) : $S = (Yo + Y_1) - E$

Y_0: Output (commercial fishery) at fishing port (with or without fishing ports).

Y_1: Outputs of municipal and inland fisheries.

E : Flow out of the province (net domestic and foreign exports).

2. Demand (D) : Provincial demand specified in paragraph (2).

Now considering the balance of demand and supply of fishes in Quezon Province with the domestic export to Manila City and other provinces achieved at a rate of 30% of the total output and the foreign export at 10% without importing the fishes from the other provinces, if there is no fishing port, it is only possible to supply fishes at about 20% of the demand in the province in the future. With a fishing port, the rate of self-sufficiency is 60% in 1990, and it is in 2000 that the target, the complete self-sufficiency will be achieved.

8-3 Economic Evaluation

8-3-1 Concept of analysis

The analysis will be made along the following lines.

(1) The effect of the fishing port development will be taken as the difference between the case where the fishing port is present and that where the fishing port is not present.

(2) For the costs, the construction, personnel, maintenance and facility renewal costs will be taken up.

(3) For the benefits, analysis will be made of the direct benefits more specifically, 1) increase in the output of fish catches and 2) improvement in the freshness of fishes due to increased supply of ice and technological improvements.

(4) Project life - 20 years after start of operation of the fishing port (1982).

(5) Prices - Prices in 1978.

(6) Discount rate - 15%.

(7) Evaluation - Net present value, cost benefit ratio and internal rate of returns will be estimated.

8-3-2 Costs

(1) . Construction cost

In the construction cost, consultant fee is included. Details of the construction cost by year and by foreign and domestic currencies are shown in Table 5-12.

The consultant fee is divided into that for construction and that for management and is allocated to the respective years. For the contingency, 15% of the total construction cost is used. From the character of the cost benefit analysis, the interest during the construction period is not included.

Table 5-12 Details of the construction cost of Lucena fishing port

US$1,000
(₱1,000)

Year	Foreign Currency			Local Currency			Total		
	Construction Works	Consultants Fee	Total	Construction Works	Consultants Fee	Total	Construction Works	Consultants Fee	Total
1979	5,992	1,995	7,987 (57,666)	6,196	180	6,376 (46,032)	12,188	2,175	14,363 (103,699)
1980	5,081	600	5,681 (41,017)	8,301	94	8,395 (60,611)	13,382	694	14,076 (101,628)
1981	3,217	735	3,952 (28,534)	5,138	119	5,257 (37,952)	8,355	854	9,209 (66,486)
Total	14,290	3,330	17,620 (127,217)	19,635	393	20,028 (144,595)	33,925	3,723	37,648 (271,813)

(2) Operating and maintenance costs

As the annual maintenance expense, 1.5% of the construction cost is counted for the years subsequent to the start of operation. For the personnel expense, a monthly wage of ₱31,600 is estimated for 28 officials (including a 10% allowance).

(3) Replacement costs

The basic facilities are of longer lifespan than 20 years, and for the functional facilities only, the replacement cost during the project life is counted with lifespan taken as 15 years (the salvage value of project cost, of course, taken into account).

8-3-3 Benefits

(1) Direct benefits

1) Increase in the output of fish catches

With development and improvement of the fishing port, mooring is eased

and landing and operational capacities are elevated greatly, while constant supply of the materials such as water, ice and fuel which are required for fishing is enabled, resulting in enlargement of the economic as well as physical capacity of the fishing port (which is presently a mere landing place as it is under the natural condition) for the fishing boats. With such enlarging the capacity, the following changes are occurred (when compared with the case of "without the project").

① Reopening of the operation of the fishing boats which have stopped the operation.

② Increase in the expedition times of the boat which is operated at present.

③ Entry of the registered fishing boats in this port which were unloading at the other ports.

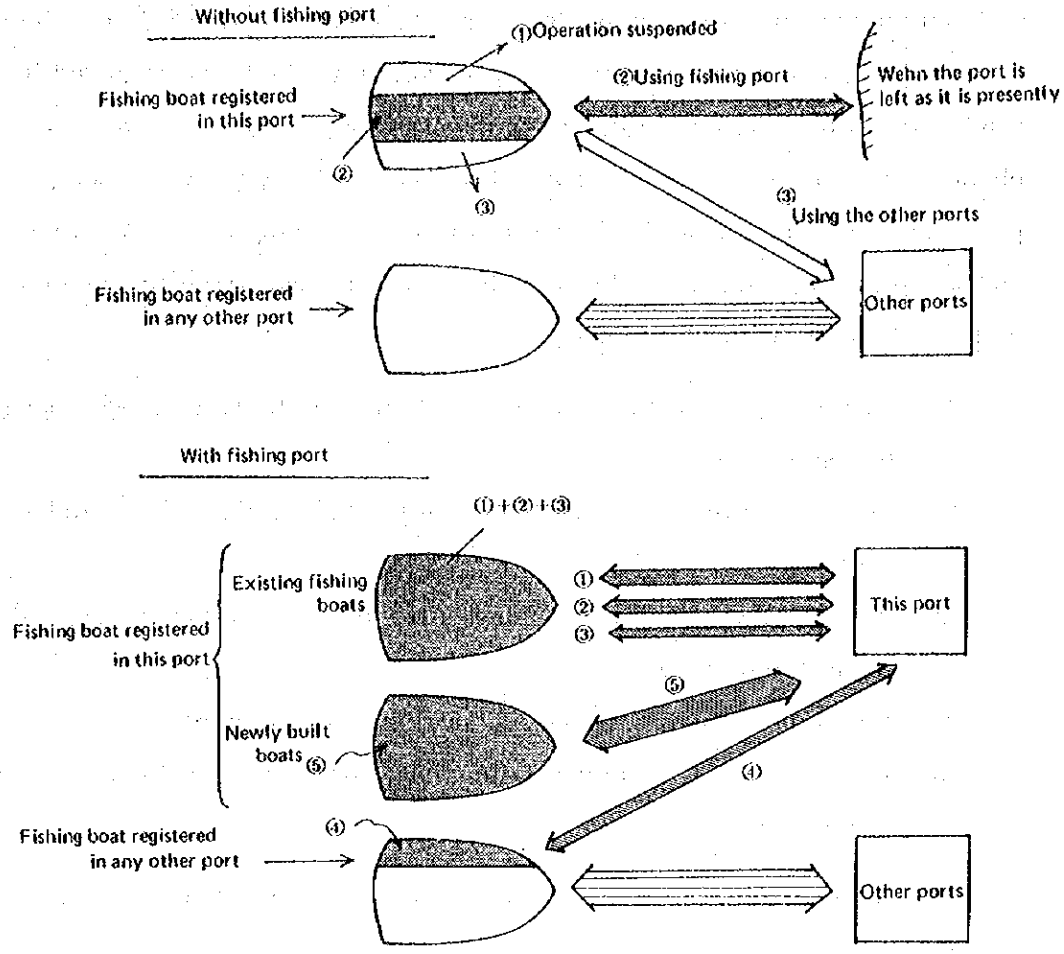
④ Entry of the fishing boats registered in the other ports.

⑤ Increase of the incoming fishing boats owing to construction of new fishing boats.

For the foregoing changes, the economic analysis is made as set forth in the following.

From the character of the fishing port, it is not conceivable that the reduction in time of the sequence of mooring-landing-fishing out will change the frequency of operations or entries of the fishing boats greatly, so that the change ② is excluded from the analysis. Those increasing incoming boats which are under ③ and ④ will not bring about much change from the viewpoint of the national economy so that they are also excluded from the analysis. Thus, the objectives of the analysis are limited to the changes ① and ⑤. For the change ⑤, while the construction of port facilities would generate benefits, corresponding increases in fishing boats' costs would take place.

Conditions for estimation and the results of estimation will be described later.



(Shadowed parts in this chart are the fishing boats using this port.)

Fig. 5-22 Change in the form of use of the fishing port.

2) Improvement in the degree of freshness of fish catches

Upon construction of the fishing port, the freshness of the catches is improved greatly due to increase in the supply of ice on one hand and to improvements in the handling and carrying techniques. Consequently, the mean price of the fishes unloaded at the port will rise, and generating much benefit adding the increase in the fish production (Assumptions and procedures of estimation are described later).

3) Method of estimation

Estimation of the net benefits from 1) and 2) above will be made accord-

ing to the procedure illustrated in the flow chart of Fig. 5-23.

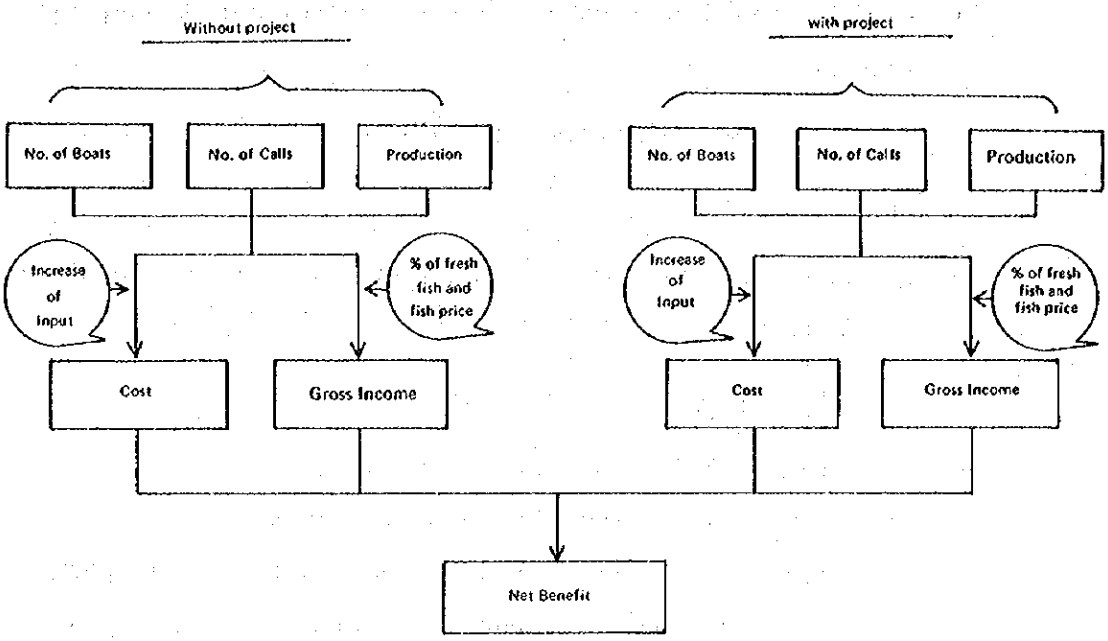


Fig. 5-23 Estimation procedure of net benefit.

Estimation of the net benefit is made according to the formula

$$\text{Net benefit } B = GI - C$$

$$GI = B_1 + B_2$$

$$C = C_1 + C_2 + C_3 + C_4$$

where GI : Increment in Gross Income,

B_1 : Increment in Gross Income due to increase in the annual output of catches,

B_2 : Increase in Gross Income due to improvement in the degree of freshness of the fish catches,

C : Increment in the cost,

C_1 : Increment in the depreciation cost of the fishing boat,

C_2 : Increment in the maintenance cost of fishing boat,

C_3 : Increment in the running cost of fishing boat, and

C_4 : Increment in the cost of ice.

Formulas for estimation of B_1 and B_2 constituting items of the gorss income are:

① B_1 is increment in gorss income due to increase in the output of fish catches

$$B_1 = (Q^1 - Q^0) \left\{ r^0.Pf + (1 - r^0)\, Ps \right\}$$

and

② B_2 is increment in gross income due to improvement in the degree of freshness of the fish catches

$$B_2 = Q^1.\ (r^1 - r^0)\ \ (Pf - Ps)$$

where Q^1 : Output when there is a fishing port,

Q^0 : Output when there is no fishing port,

r^1 : Degree of freshness when there is a fishing port,

r^0 : Degree of freshness when there is no fishing port,

P_f : Price of fresh fish, and

Ps : Price of spoiled fish.

Basic conditions for estimation are as given below.

① Number of fishing boats, fishing boat calls and output of fish catches.

Table 5-13 Number of fishing boats, boat calls and output.

Project	Type of Boats	1981			1990			2000		
		No. of Boats	Calls	Production (t)	No. of Boats	Calls	Production (t)	No. of Boats	Calls	Production (t)
Without Project	Trawlers	11	467	2,800	30	1,260	7,600	73	3,066	18,400
	Bagnetters	44	4,041	19,800	112	10,304	50,400	277	25,484	124,800
	Total	55	4,508	22,600	142	11,564	58,000	350	28,550	143,200
With Project	Trawlers	9	367	2,200	9	383	2,300	10	400	2,400
	Bagnetters	33	3,020	14,800	35	3,204	15,700	37	3,388	16,600
	Total	42	3,387	17,000	44	3,587	18,000	47	3,788	19,000

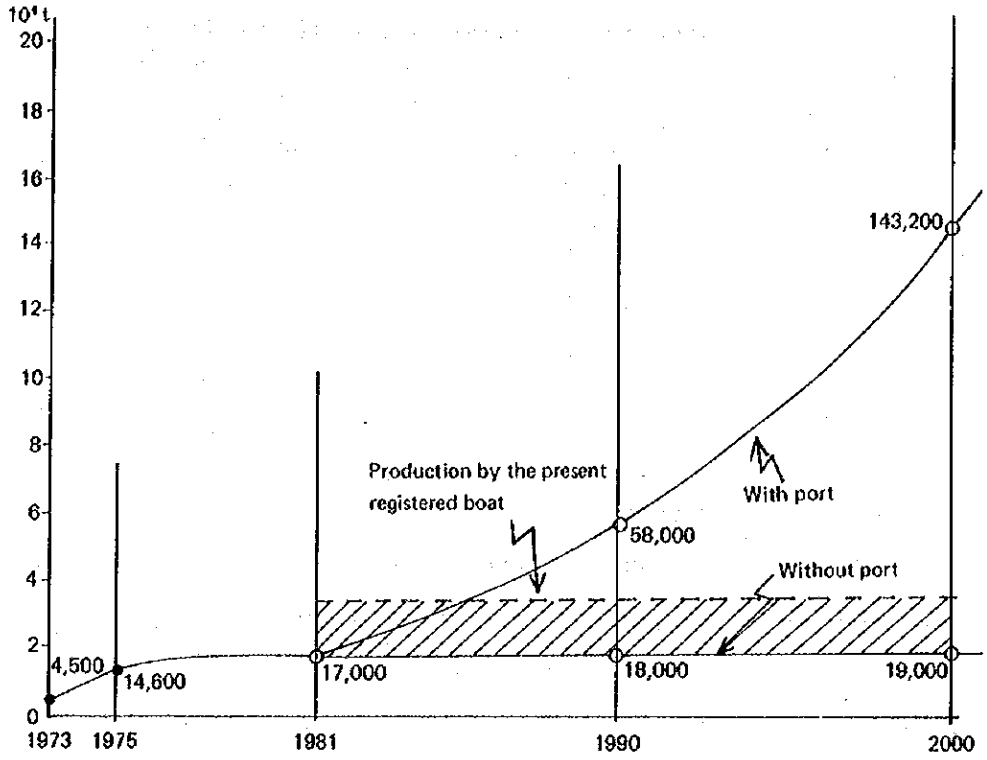


Fig. 5-24 Forecasted fish production with and without fishing port.

Table 5-13 and Fig. 5-24 show the values with all of the fishing boats coming into this port taken as objectives, and these values are subjected to the following procedure for estimation of the net effect of the fishing port project to the national economy. That is, assuming that there is no increase in the number of days per expedition of fishing operation and that the fishing boats using the port are all of the registered boats in this port, there is obtained, by subtracting the fishing boats using the other ports from the foregoing forecasted value, the increment in the incoming fishing boats due to the fishing boats aving the operation suspended reopening the operation and the fishing boats newly built. This value is taken as a basis of calculation in the following estimation.

② Fish prices

The fish prices are assumed to be 4₱/kg for fresh fishes and 1.5₱/kg for spoiled fishes as of 1978.

Table 5-14 Fish prices (upon hearing at the site).

(1978)

Class	Price (P/kg)
1st Class	10
2nd Class	4 – 5
3rd Class	3 – 4
dried fish	1.5
Fish meal	1
fish sauce	1

③ Degree of freshness

The present ice plants in Lucena City have the capacity to make 60 tons ice a day, and if the plant is operated for 300 days a year, it is 18,000 tons/year. If 30% of this is used for maintenance of the freshness of fishes, quantities of ice for such use are 5,400 tons/year currently.

The present fish production is 13,900 tons by bagnetters and 800 tons by trawlers. The ice used for maintenance of the freshness of fishes loaded on the boats and those after landing is 0.5 ton per ton of fishes for the bagnetters or 1.5 tons for the trawlers. Accordingly, 8,150 tons of ice are required for maintaining the freshness of fishes. The maximum supply of ice being 5,400 tons presently, 2,750 tons of ice (34%) are in shortage. Assuming that some several percentage of fish catches are damaged during the process of carriage, the percentage of spoiled fishes was taken as 40%. This represents the percentage when there is no fishing port. When the fishing port is available, nearly all of the fishes are maintained in the fresh condition through supply of ice and improved handling techniques. Here, to consider the effect accruing from supply of ice and the improvement of fish treatment, the rate of spoiled fishes, when the fishing port is available, is assumed to be decreased up to 20%.

④ Fishing boat building cost and annual maintenance cost

The fishing boat construction cost and annual maintenance cost are as shown in the following table.

Table 5-15 Fishing boat construction cost and annual maintenance cost.

₱

Type of Boats	Gross Ton	Construction Cost	Annual maintenance cost		
			Repair	Fishing nets, etc.	Total
Trawlers	29.7	99,000	4,950	66,667	71,617
Bagnetters	20.3	67,667	3,383	13,333	16,716

Note: 1) The fishing boat construction cost is assumed to be 3,333 ₱ per gross ton. (Calculated as 1 ₱ = 30 ¥)

2) The repair expense is assumed to be 5% of the construction cost.

3) Fishing nets etc.

Purse Seiners	66,667 ₱ /year
Trawler	66,667 ₱ /year
Bagnetters	13,333 ₱ /year
Small boats	Negligible

4) The fishing boats are assumed to be usable for 8 years.

⑤ Fishing boat running cost

This comprises the wage and salaries, fuel cost, water service fee, crew meal expense, etc., and the basic figures for estimation are as shown below.

Table 5-16 Fishing boat running cost per expedition

₱

Type of Boats	days per expedition	No. of Crew	Average expedition times per year	Crew meal per expedition	wages per expedition	Water consumption		operating hours perdey (h/day)	Horse Power (H.P.)	Fuel consumption	
						ℓ	₱			ℓ	₱
Trawlers	7	12	42	252	1,260	2,520	3	24	226.7	7,236	14,472
Bagnetters	1	24	92	72	360	480	2	6	220.5	251	502

Note: 1) Fuel – 0.19 ℓ/hp. hour.

2) Fuel unit price – 2₱/ℓ

3) Water – (1) Trawler, 30 ℓ/day.
(2) Purse Seiner 30 ℓ/day
(3) Bagnetter 20 ℓ/day

4) Water unit price – domestic water, 0.5 ₱ /m³; and industrial and commercial water, 1.0 ₱ /m³ Here, the latter is employed (0.001 ₱ /ℓ).

5) Wage and salaries – 15 ₱ /man day (average of the unskilled and the skilled labourer

6) Meal expense – 3 ₱ /man day.

⑥ Ice cost

Use of ice by the bagnetters is 0.5 ton per ton of fishes, and 1.5 tons is required for the trawlers.

For the unit price, the market price of 120 P/t is used.

4) Estimation

(1) Net benefit due to increase in the output of fish catches

₱ 296,121,000

(2) Net benefit due to improvement in the freshness of fish catches

₱ 98,132,000

(3) Total net benefit ₱ 394,253,000

(2) Other benefits

The other benefits which the fishing port improvement brings about are listed in the following.

1) Improvement in self-sufficiency of fishery products.
2) Modernization of fisheries upon accumulation of a variety of functions.
3) Encouraging investments.
4) Stabilization of fish prices.
5) Creation of employment opportunities.
6) Acquisition of new techniques.
7) Increasing income of fishermen.
8) Strengthening the fishermen's association.
9) Reducing congestion in the commercial port (Cotta).
10) Realization of a complementary role to the Navotas fishing port through increasing supply of fish to Manila City.
11) Alleviating labour of the fishermen (among the crew) who are offering the service of carrying the fishes from the fishing boat to the landing site without remuneration.

8-3-4 Evaluation

The result of economic evaluation on construction of the Lucena fishing port is as follows.

With the net present value at ₱162,174,000 (¥4,865,220,000 upon conversion at 1₱=30¥), cost benefit ratio at 1.70 and internal rate of returns at 21.4%, the project is considered to be appropriate from the national economic point of view.

Chapter 9 Financial Analysis

9-1 Financial Analysis

Construction of the Lucena fishing port is carried out as one of the fishing port construction programs of the Government of the Republic of the Philippines for promotion of the fisheries industry and is, therefore, a highly public project requiring infrastructural investments.

Management of the fishing port will be made by PFMA under the Government of the Republic of the Philippines. Here, with the fishing port considered as an independent economic unit, it will be examined what conditions will have to be satisfied mainly for insuring soundness in the management, and upon the result of the examination, necessary proposals will be made.

9-2 Main Factors of Financial Analysis

9-2-1 Usage of the fishing port

The number of fishing boats using the port, frequency of entry and fish landing amount, which constitute the basic data for financial analysis, are set forth in Table 5-17.

Table 5-17 Annual number of using fishing boats, frequency of entry and fish landing amout.

Item	Year	Trawler	Bagnetter	Total
No. of Boats	1981	11	44	55
	1990	30	112	142
	2000	73	277	350
No. of Calls	1981	467	4,041	4,508
	1990	1,260	10,304	11,564
	2000	3,066	25,484	28,550
Fish production (tons)	1981	2,800	19,800	22,600
	1990	7,600	50,400	58,000
	2000	18,400	124,800	143,200

9-2-2 Method of estimation of the revenue of fishing port

(1) Sources of revenue

Here, the revenue of the fishing port is limited to the fees for use of the facilities related to handling of fish catches and supply of material to the fishing boats and the profit from sales of ice when the ice plant and cold storage facilities are operated directly by PFMA.

(2) Method of estimation of the revenue

Basic data for estimation of the revenue and the items of revenue are represented in Fig. 5-25. The method of estimation of the revenue is illustrated in Fig. 5-26.

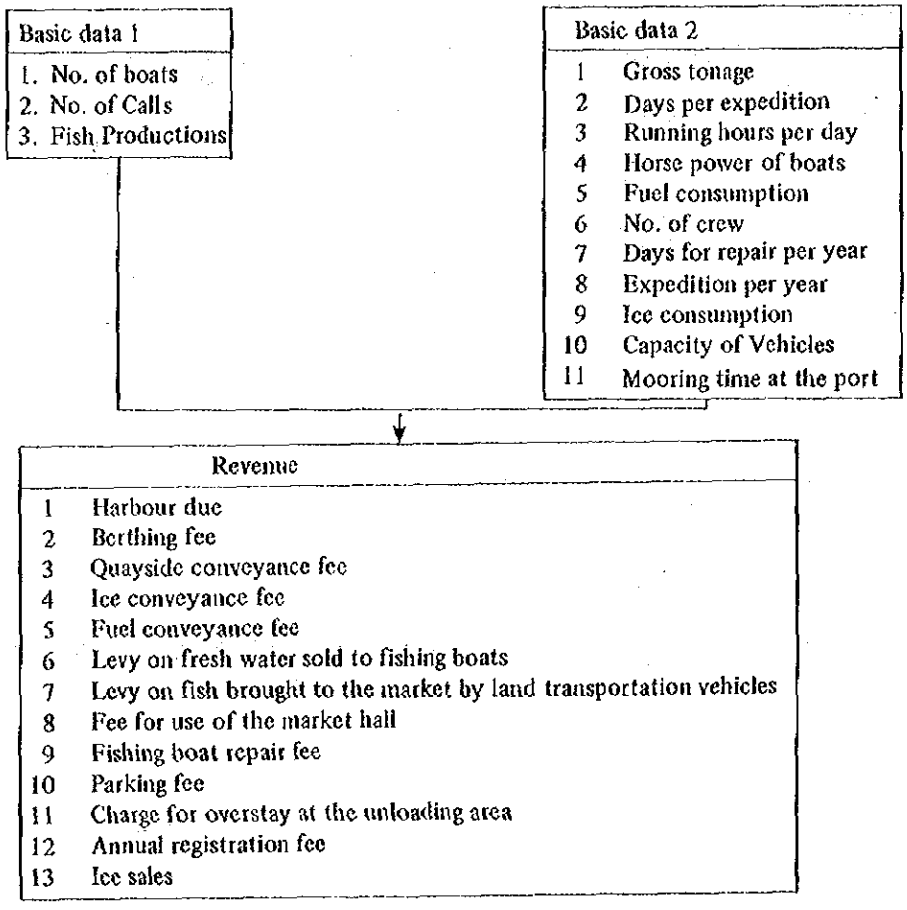


Fig. 5-25 Basic data for estimation of the revenue and items of estimation.

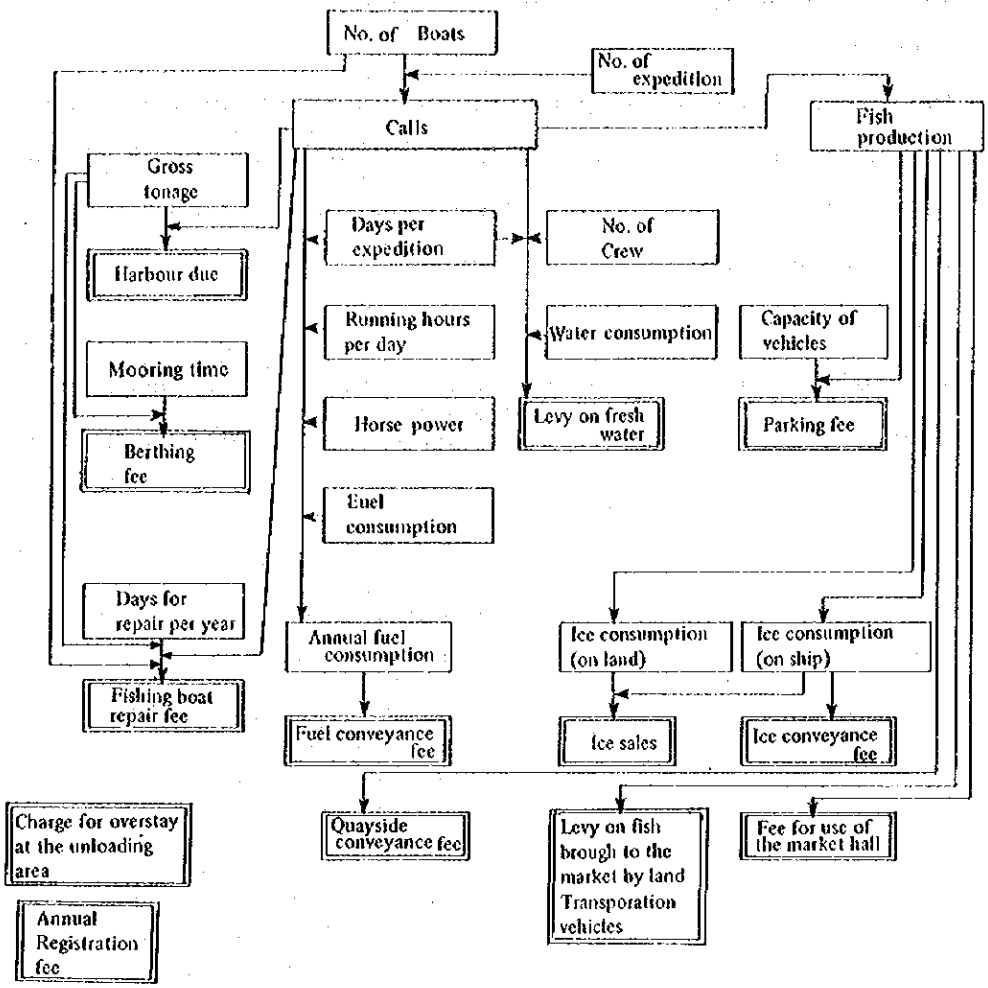


Fig. 5-26 Method of estimation of the revenue.

9-2-3 Method of Cost estimation

The items of cost are wage and salaries, maintenance expense, depreciation and interests on loans.

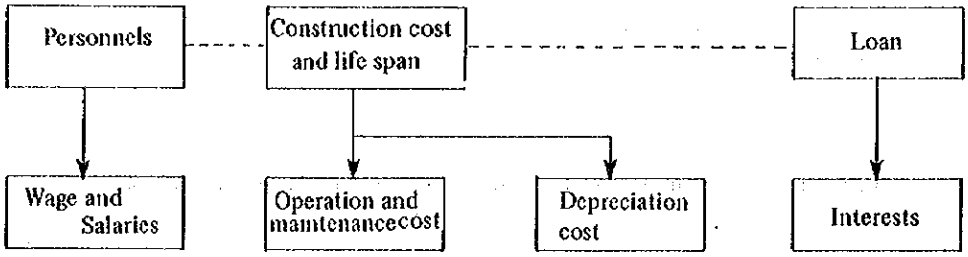


Fig. 5-27 Method of cost estimation

9-3 Revenue of Fishing Port

9-3-1 Harbour due

This is a fee collected from the fishing boats entering the port according to the gross tonnage of the respective boats, and the unit of the fee is 0.6 (₱/gross tonnage per entry).

The calculation formula is

0.6 ×(Gross tonnage)×(Number of entries).

The gross tonnage of the respective types of fishing boats is as shown in Table 5-18.

Table 5-18 Gross tonnage of using fishing boats.

Item \ Type of Boats	Trawler	Bagnetter
Gross tonage	29.7	20.3

The revenue is as shown in Table 5-19.

Table 5-19 Revenue from harbour due

Year	Harbour due	Vessel Calls
	₱	Calls
1981	57,541	4,508
1985	97,726	7,644
1990	147,956	11,564
1995	256,494	20,057
2000	365,031	28,550

9-3-2 Berthing fee

This is a fee for use of the berth to be collected from the fishing boats utilizing the fishing port according to the gross tonnage, and the units of the fee are as shown in Table 5-20.

Table 5-20 Unit of berting fee.

Gross tonage(GT)	GT<10	10≦GT<100	100≦GT<200	200≦GT
Unit fee (P/time)	10	12	14	16

The calculation formula is

(Unit fee)×(Number of entries),

The revenue is scheduled in Table 5-21.

Table 5-21 Revenue from berthing fees.

year	fee	Boats Calls
1981	54,096 ₱	4,508 Calls
1985	91,728	7,644
1990	138,768	11,564
2000	342,600	28,550

9-3-3 Quayside conveyance fee

Where the fishes are conveyed on the quay, this is a fee for use of the facility, and the unit of the fee is 1.25₱ per tub.

The tub has a capacity of 40 kg so that the calculation formula is

$$1.25\times\left(\frac{1000}{40}\right)\times(\text{Landing amount}),$$

The revenue is then presented in Table 5-22.

Fig. 5-22 Revenue from quayside conveyance fees.

Year	fee	fish production
1981	706,250 ₱	22,600 tons
1985	1,197,917	38,333
1990	1,812,500	58,000
1995	3,143,750	100,600
2000	4,475,000	143,200

9-3-4 Ice conveyance fee

This is a fee for conveyance of ice supplied to the fishing boats. The ice is supplied to the trawlers, and its quantity is the same to that of the fish catches landed. The unit of the conveyance fee is 0.09398 (₱/block). The calculation formula is

$$0.9398 \times \left(\frac{1000}{50}\right) \times (\text{Quantity of fish land (for trawlers)})$$

provided 1 block = 50 kg.

The revenue is as shown in Table 5-23.

Table 5-23 Revenue from ice conveyance fees.

Year	fee	fish production (Trawler)
1981	5,263 ₱	2,800 tons
1985	9,273	4,933
1990	14,286	7,600
1995	24,436	13,000
2000	34,586	18,400

9-3-5 Fuel conveyance fee

This is the fee for conveyance of the fuel supplied to the fishing boats and is a fee for use of the fuel supply facility. The annual amount of consumption of the fuel is given by

(Number of entries)×(Days of expedition)×(Running hours d day)
×(Horse power)×(Main fuel Consumption).

and the unit fee is 4 (₱/kl). The calculation formula is

$$4 \times \left(\frac{1}{1000}\right) \times (\text{Annual fuel consumption})$$

The original units required for calculation are of the values shown in Table 5-24.

Table 5-24 Original units concerning fuel consumption.

Item \ Type of Boats		Trawler	Bagnetter
days per expedition	(day)	7	1
Running hours per day	(hr)	24	6
Horse power	(H.P.)	297	20.3
Fuel consumption	(ℓ/H.P. hr)	0.19	0.19

The revenue is as shown in Table 5-25.

Table 5-25 Revenue from fuel conveyance fees.

Year	fee	Annual Fuel consumption	Boat Calls
1981	17,580 ₱	4,395 kℓ	4,508 calls
1985	30,581	7,645	7,644
1990	46,831	11,708	11,564
1995	80,600	20,150	20,057
2000	114,369	28,592	28,550

9-3-6 Levy on fresh water sold to fishing boats

This is collected for the water supply to the fishing boats and is a fee for use of the facility.

The annual amount of consumption of water is given by

(Number of entries)×(Original unit of water consumption)
×(Number of crew)×(Days of expedition).

and the unit of the fee is 0.5 ₱/ton. Then, the calculation formula is

$$0.5 \times \left(\frac{1}{1000}\right) \times (\text{Annual water consumption}).$$

The original units required for calculation are of the values shown in Table 5-27.

Table 5-26 Original units concerning water consumption.

Item \ Type of Boats	Trawler	Bagnetter
Water consumption (ℓ/person.day)	30	20
No. of Crew (person)	12	24
days per expedition (days)	7	1

Table 5-27 Revenue from levies on fresh water sold to fishing boats.

Year	Levies	Annual water consumption	Boat Calls
1981	1,558 ₱	3,117 tons	4,508 calls
1985	2,670	5,341	7,644
1990	4,061	8,121	11,564
1995	7,020	14,040	20,057
2000	9,979	19,959	28,550

9-3-7 Levy on fish brought to the market by land transportation vehicles

This is a fee for transportation of fishes from fishing boats to the market, and the unit of the fee is 0.50 (₱/tub). The calculation formula is

$$0.50 \times \left(\frac{1000}{40}\right) \times (\text{Landed amount of fish catches}).$$

The revenue is as shown in Table 5-28.

Table 5-28 Revenue from levies on fishes brought to the market by land transportation vehicles.

Year	Levies	fish production
1981	282,500 ₱	22,600 tons
1985	479,167	38,333
1990	725,000	58,000
1995	1,257,500	100,600
2000	1,790,000	143,200

9-3-8 Fee for use of the market hall

This is a fee for use of the market hall, and the unit of the fee is 0.15 (₱/tub). The calculation formula is

$$0.15 \times \left(\frac{1000}{40}\right) \times (\text{Landed amount of fish catches}).$$

The revenue is as shown in Table 5-29.

Table 5-29 Revenue from fee for use of the market hall.

Year	fee	fish production
1981	84,750 ₱	22,600 tons
1985	143,750	38,333
1990	217,500	58,000
1995	377,250	100,600
2000	537,000	143,200

9-3-9 Fishing boat repair fee

Upon repair of a fishing boat, this is a fee for use of the facility to be collected according to the gross tonnage and the number of days of repair. The units of the fee are as shown in Table 5-30.

Table 5-30 Units of the fishing boat repair fee.

Gross tonage (GT)	GT<10	10≦GT<100	100≦GT<200	200≦GT
Unit fee (₱/day)	10	15	20	30

Accordingly, the calculation formula is

(Unit fee)×(Unmber of days of repair)×(Number of fishing boats).

The original units required for calculation are of the values shown in Table 5-31, and the revenue is as shown in Table 5-32.

Table 5-31 Original units related to use of the repair facility.

Item \ Type of boat	Trawler	Bagnetter
Gross tonage (tons/boat)	29.7	20.3
Days for repair per year (day)	5	5

Table 5-32 Revenue from fishing boat repair fees.

Year	fee	No. of Boats
1981	4,125 ₱	55
1985	7,025	94
1990	10,650	142
1995	18,450	246
2000	26,250	350

9-3-10 Parking fee

This is a fee for the fish carrier trucks in use of the parking facility. The carrier trucks are of a fish loading capacity of 18 tubs/truck (720 kg/truck), and the parking fee is 5₱ a day or less.

The calculation formula is

$$5 \times \left(\frac{1000}{720}\right) \times (\text{Landed amount of catches}).$$

Then, the revenue is as shown in Table 5-33.

Table 5-33 Revenue from parking fees.

Year	Fee	fish production
1981	156,944 ₱	22,600 tons
1985	266,204	38,333
1990	402,778	58,000
1995	698,611	100,600
2000	994,444	143,200

9-3-11 Charge for overstay at the unloading area

This is a charge for staying over the standard time at the unloading area, but it is difficult to estimate such charge so that it is not counted here.

9-3-12 Annual registration fees

This represents the fees for registration of the brokers, wholesellers and shipowners but is not included here.

9-3-13 Ice sales

This represents the profit from sales of ice for maintaining the freshness of fishes. The wholesale price of ice is taken as 120 ₱/t, and its 20% or 24 (₱/t) is assumed to be the profit. The original units of the ice consumption are shown in Table 5-34. The calculation formula is

$$24 \times 1000 \times (1 \times \text{Landed amount of catches (trawlers)} + 1/2 \times \text{Total amount of landed catches}).$$

The revenue is given as shown in Table 5-35.

Table 5-34 Ice consumption original units.

kg/fish kg

Item \ Type of boats	Trawler	Bagnetter
Ice consumption (on ship)	1	0
Ice consumption (on land)	0.5	0.5

Table 5-35 Ice sales.

Year	Net Income	Ice consumption (on ship)	Ice consumption (on land)
1981	338,400 ₱	2,800 tons	11,300 tons
1985	578,400	4,933	19,167
1990	878,400	7,600	29,000
1995	1,519,200	13,000	50,300
2000	2,160,000	18,400	71,600

9-4 Expenditures of Fishing Port

9-4-1 Personnel expense

The officials of the organization of administration of the fishing port are estimated at 28 persons. The monthly personnel expense is assumed to be ₱31,600. Then, with an allowance of 10% added, the annual personnel expense is estimated at ₱417,120.

9-4-2 Maintenance expense

As the annual maintenance expense of the fishing port facilities, 1.5% of the construction cost is taken, and an amount of ₱3,674,068/year is estimated.

9-4-3 Depreciation

The basic facilities are of longer lifespan so that they are excluded from the objects of depreciation, with the maintenance expense counted for them.

The functional facilities have the 15 years lifespan, with the salvage value set to 0. With the straight line method, the annual amount of depreciation is ₱4,077,182.

9-4-4 Interest on loan

The loan as the management entity is ₱127,217,000. The interest was then calculated at a rate of 1.5 percent. The principal repayment is done equally every year in 15 years after 1987 so that the interest payable after 1987 will decrease gradually.

9-5 Financial Evaluation

Income statement of the Lucena fishing port and the cash flow are set forth in Tables 5-36 and 5-37.

As the result of the foregoing financial analysis, it was found that it would be difficult financially for PFMA to perform the operation of the fishing port as the independent entity. That is, repayment of the loan and payment of the interest of the fishing port construction cost requiring an enormous amount of investment are hardly practicable, making it impossible to be grounded as an enterprise.

Accordingly, for the management of the fishing port to be operated soundly, all or considerable part of the fishing port construction should be carried out directly by the Government of the Republic of the Philippines so that the financial burden on PFMA, management entity of the fishing port after completion, would be reduced.

However, as seen from the result of the economic evaluation in Chapter 8, the development and improvement of the fishing port will bring about many economic effects and are thus worthy of investment.

Table 5-36 Income statement of Lucena fishing port

(P)

Item \ Year	1979	1980	1981	1982	1983	1984	1985	1986
1. Revenues								
Harbour due	—	—	—	57,541	67,587	77,633	87,680	97,726
Berthing Fee	—	—	—	54,096	63,504	72,912	82,320	91,728
Quayside Conveyance Fee	—	—	—	706,250	829,167	952,083	1,075,000	1,197,917
Ice Conveyance Fee	—	—	—	5,263	6,266	7,268	8,271	9,273
Fuel Conveyance Fee	—	—	—	17,580	20,831	24,081	27,331	30,581
Levy on Fresh Water sold to Fishing Boats	—	—	—	1,558	1,836	2,114	2,392	2,670
Levy on Fish Brought to the Market	—	—	—	282,500	331,667	380,833	430,000	479,167
Fee for Use of the Market Hall	—	—	—	84,750	99,500	114,250	129,000	143,750
Fishing Boat Repair Fee	—	—	—	4,125	4,850	5,575	6,300	7,025
Parking Fee	—	—	—	156,944	184,259	211,574	238,889	266,204
Ice Sales	—	—	—	338,400	398,400	458,400	518,400	578,400
Total	—	—	—	1,709,009	2,007,867	2,306,724	2,605,582	2,904,440
2. Expenses								
Salaries and Wages	—	—	—	417,230				
Repair and Maintenance	—	—	—	3,674,068	8,456,711	〃	〃	〃
Depreciation	—	—	—	4,365,413				
Interest	1,009,162	2,736,122	3,953,261	4,452,600	4,452,600	4,452,600	4,452,600	4,452,600
Total	1,009,162	2,736,122	3,953,261	12,909,311	12,909,311	12,909,311	12,909,311	12,909,311
3. Income before Depreciation and Interest	0	0	0	△ 2,382,289	△ 2,083,431	△ 1,784,574	△ 1,485,716	△ 1,186,858
4. Net Income	△ 1,009,162	△ 2,736,122	△ 3,953,261	△11,200,302	△10,901,444	△10,602,587	△10,303,729	△10,004,871
5. Accumulated Income	△ 1,009,162	△ 3,745,284	△ 6,689,383	△17,889,685	△28,791,129	△39,393,716	△49,697,445	△59,702,316

Item \ Year	1987	1988	1989	1990	1991	1992	1993	1994
1. Revenues								
Harbour Due	107,772	117,818	127,864	137,910	147,956	169,663	191,371	213,079
Berthing Fee	101,136	110,544	119,952	129,360	138,768	159,151	179,534	199,918
Quayside Conveyance Fee	1,320,833	1,443,750	1,566,667	1,689,583	1,812,500	2,078,750	2,345,000	2,611,250
Ice Conveyance Fee	10,276	11,278	12,281	13,283	14,286	16,316	18,346	20,376
Fuel Conveyance Fee	33,831	37,081	40,331	43,581	46,831	53,585	60,339	67,093
Levy on Fresh Water sold to Fishing Boats	2,948	3,226	3,504	3,783	4,061	4,652	5,244	5,836
Levy on Fish brought to the Market	528,333	577,500	626,667	675,833	725,000	831,500	938,000	1,044,500
Fee Use of the Market Hall	158,500	173,250	188,000	202,750	217,500	249,450	281,400	313,350
Fishing Boat Repair Fee	7,750	8,475	9,200	9,925	10,650	12,210	13,770	15,330
Parking Fee	293,519	320,833	348,148	375,463	402,778	461,944	521,111	580,278
Ice Sales	638,400	698,400	758,400	818,400	878,400	1,006,560	1,134,720	1,262,880
Total	3,203,298	3,502,156	3,801,014	4,099,871	4,398,729	5,043,782	5,688,836	6,333,889
2. Expenses								
Salaries and Wages	417,230							
Repair and Maintenance	3,674,068	8,456,711	〃	〃	〃	〃	〃	〃
Depreciation	4,365,413							
Interest	4,452,600	4,155,758	3,858,916	3,562,074	3,265,232	2,968,390	2,671,548	2,374,706
Total	12,909,311	12,612,469	12,315,627	12,018,785	11,721,943	11,425,101	11,128,269	10,831,417
3. Income before Depreciation and Interest	△ 888,000	△ 589,142	△ 290,284	8,573	307,431	952,484	1,597,538	2,242,591
4. Net Income	△ 9,706,013	△ 9,110,313	△ 8,514,613	△ 7,918,914	△ 7,323,214	△ 6,381,319	△ 5,439,423	△ 4,497,528
5. Accumulated Income	△69,408,329	△78,518,642	△87,033,255	△94,952,169	△102,275,383	△108,656,702	△114,096,125	△118,593,653

Item \ Year	1995	1996	1997	1998	1999	2000	2001	
1. Revenues								
Harbour due	234,786	256,494	278,201	299,909	321,616	343,324	365,031	
Berthing Fee	220,301	240,684	261,067	281,450	301,834	322,217	342,600	
Quayside Conveyance Fee	2,877,500	3,143,750	3,410,000	3,676,250	3,942,500	4,208,750	4,475,000	
Ice Conveyance Fee	22,406	24,436	26,466	28,496	30,526	32,556	34,586	
Fuel Conveyance Fee	73,846	80,600	87,354	94,108	100,862	107,615	114,369	
Levy on Fresh Water sold to Fishing Boats	6,428	7,020	7,612	8,204	8,796	9,387	9,979	
Levy on Fish brought to the Market	1,151,000	1,257,500	1,364,000	1,470,500	1,577,000	1,683,500	1,790,000	
Fee for Use of the Market Hall	345,300	377,250	409,200	441,150	473,100	505,050	537,000	
Fishing Boat Repair Fee	16,890	18,450	20,010	21,570	23,130	24,690	26,250	
Parking Fee	639,444	698,611	757,778	816,944	876,111	935,278	994,444	
Ice Sales	1,391,040	1,519,200	1,647,360	1,775,520	1,903,680	2,031,840	2,160,000	
Total	6,978,942	7,623,995	8,269,048	8,914,101	9,559,154	10,204,208	10,849,261	
2. Expenses								
Salaries and Wages	417,230							
Repair and Maintenance	3,674,068	8,456,711	〃	〃	〃	〃	〃	
Depreciation	4,365,413							
Interest	2,077,864	1,781,022	1,484,180	1,187,338	890,496	593,654	296,812	
Total	10,534,575	10,237,733	9,940,891	9,644,049	9,347,207	9,050,365	8,753,523	
3. Income before Depreciation and Interest	2,887,644	3,532,697	4,177,745	4,822,803	5,467,855	6,112,910	6,757,963	
4. Net Income	△ 3,555,633	△ 2,613,738	△ 1,671,843	△ 729,948	211,947	1,153,843	2,095,738	
5. Accumulated Income	△ 122,149,286	△ 124,763,024	△ 126,434,867	△ 127,164,815	△ 126,952,868	△ 125,799,025	△ 123,703,287	

Table 5-37 Cash-flow schedule of Lucena fishing port

(P)

Item \ Year		1979	1980	1981	1982	1983	1984	1985	1986
1. Source of Funds	Equity	46,032,460	60,611,185	37,951,944	—	—	—	—	—
	Loan	57,666,393	41,017,065	28,533,685	—	—	—	—	—
	Gov. Project Allotment	1,009,162	2,736,122	3,953,261	6,834,889	6,536,031	6,237,174	5,983,316	5,639,458
	Depreciation	—	—	—	4,365,413	4,365,413	4,365,413	4,365,413	4,365,413
	Net income	△ 1,009,162	△ 2,736,122	△ 3,953,261	△11,200,302	△10,901,444	△10,602,587	△10,303,729	△10,004,871
	Total	103,698,853	101,628,250	66,485,629	0	0	0	0	0
2. Uses of Funds	Construction	103,698,853	101,628,250	66,485,629	—	—	—	—	—
	Loan Amortization	—	—	—	—	—	—	—	—
	Reinvestment	—	—	—	—	—	—	—	—
	Total	103,698,853	101,628,250	66,485,629	0	0	0	0	0

Item \ Year		1987	1988	1989	1990	1991	1992	1993	1994
1. Source of Funds	Equity	—	—	—	—	—	—	—	—
	Loan	—	—	—	—	—	—	—	—
	Gov. Project Allotment	13,821,800	13,226,100	12,630,400	12,034,701	11,439,001	10,497,106	9,555,210	8,613,315
	Depreciation	4,365,413	4,365,413	4,365,413	4,365,413	4,365,413	4,365,413	4,365,413	4,365,413
	Net income	△ 9,706,013	△ 9,110,313	△ 8,514,613	△ 7,918,914	△ 7,323,214	△ 6,381,319	△ 5,439,423	△ 4,497,528
	Total	8,481,200	8,481,200	8,481,200	8,481,200	8,481,200	8,481,200	8,481,200	8,481,200
2. Uses of Funds	Construction	—	—	—	—	—	—	—	—
	Loan Amortization	8,481,200	8,481,200	8,481,200	8,481,200	8,481,200	8,481,200	8,481,200	8,481,200
	Reinvestment	—	—	—	—	—	—	—	—
	Total	8,481,200	8,481,200	8,481,200	8,481,200	8,481,200	8,481,200	8,481,200	8,481,200

Item \ Year		1995	1996	1997	1998	1999	2000	2001	
1. Source of Funds	Equity	—	—	—	—	—	—	—	
	Loan	—	—	—	—	—	—	—	
	Gov. Project Allotment	7,671,420	6,729,525	73,268,820	4,845,735	3,903,840	2,961,944	2,020,049	
	Depreciation	4,365,413	4,365,413	4,365,413	4,365,413	4,365,413	4,365,413	4,365,413	
	Net income	△ 3,555,633	△ 2,613,738	△ 1,671,843	△ 729,948	211,947	1,153,843	2,095,738	
	Total	8,481,200	8,481,200	73,962,390	8,481,200	8,481,200	8,481,200	8,481,200	
2. Uses of Funds	Construction	—	—	—	—	—	—	—	
	Loan Amortization	8,481,200	8,481,200	8,481,200	8,481,200	8,481,200	8,481,200	8,481,200	
	Reinvestment	—	—	65,481,190	—	—	—	—	
	Total	8,481,200	8,481,200	73,962,390	8,481,200	8,481,200	8,481,200	8,481,200	

Part VI
Sual Fishing Port Development and Improvement Project

PART VI SUAL FISHING PORT DEVELOPMENT AND IMPROVEMENT PROJECT

Chapter 1 Basic Line of Development and Improvement

The Sual fishing port development and improvement project will have to be implemented along the basic line stated in the following with due consideration of the present condition of marine products and their marketing in the Philippines and Pangasinan, situation of the landing site and the government policies and plans for promotion of the fishery industries discussed in PART I.

(1) The project should not remain merely in dissolving the shortage in the present facilities but be capable of coping satisfactorily with the prospected sharp increase in port demand in the near future. Consideration should also be made for the project to be also capable of coping with the great development prospected of the fishery thereafter.

(2) The Sual fishing port will be so developed and improved that it will be able to exhibit its functions as a pivotal fishing port for development of the fishery in the Lingayen Gulf district, Luzon.

(3) Reclamation of the land for fishing port facilities will be made economically in use of the dredged soil of the basin.

Chapter 2 Establishment of Project Targets

2-1 Project Target Year

For the basic facilities of breakwaters, mooring facilities, bulkhead and basins and functional facilities of road and land for fishing port facilities, the target year will be set at 2000 A.D.

For the other functional facilities such as fish market, sheds, ice plant and cold storage, water supply facility, fuel supply facility, fishing port administration facilities and fishing boats and engines repair shops, the target year will be set at 1990.

2-2 Planned Handling Amount and Fishing Boat Force

The planned handling amount of the catches and the fishing boat force in the respective target years will be as shown in Table 6-1.

Table 6-1 Planned handling amounts and fishing boat force

Target year	Planned Handling Amount of Catches	Number of Trawlers	Number of Small Fishing Boats
1990	13,200 tons	28 boats	1,400 boats
2000 AD	25,000	60	2,200

Chapter 3 Project Site Selection of Project Site

The fishing port construction site selected by the Government of the Republic of the Philippines is as shown in Fig. 6-1.

As the result of examination at the site, the Study Team considers this point to be an adequate project site from the reasons set forth in the following, and thus the projected fishing port will be located here.

The Mission, too, studied locally, and as a result has decided to locate the project site there, considering that the place is a proper project site as the fishing port construction site for the following reasons:

(1) It is a natural favorable port surrounded by two peninsular areas.

(2) It is close to Lingayen City (provincial seat), Dagupan City (the largest city in the province), etc. and allows the fishing port development with relatively small construction cost.

(3) There is sufficient area for fishing port construction.

(4) It is a fish landing place in Sual district.

(5) Electricity and water can be obtained easily.

(6) There is a road (two-lane asphalt pavement) adjacent to it behind.

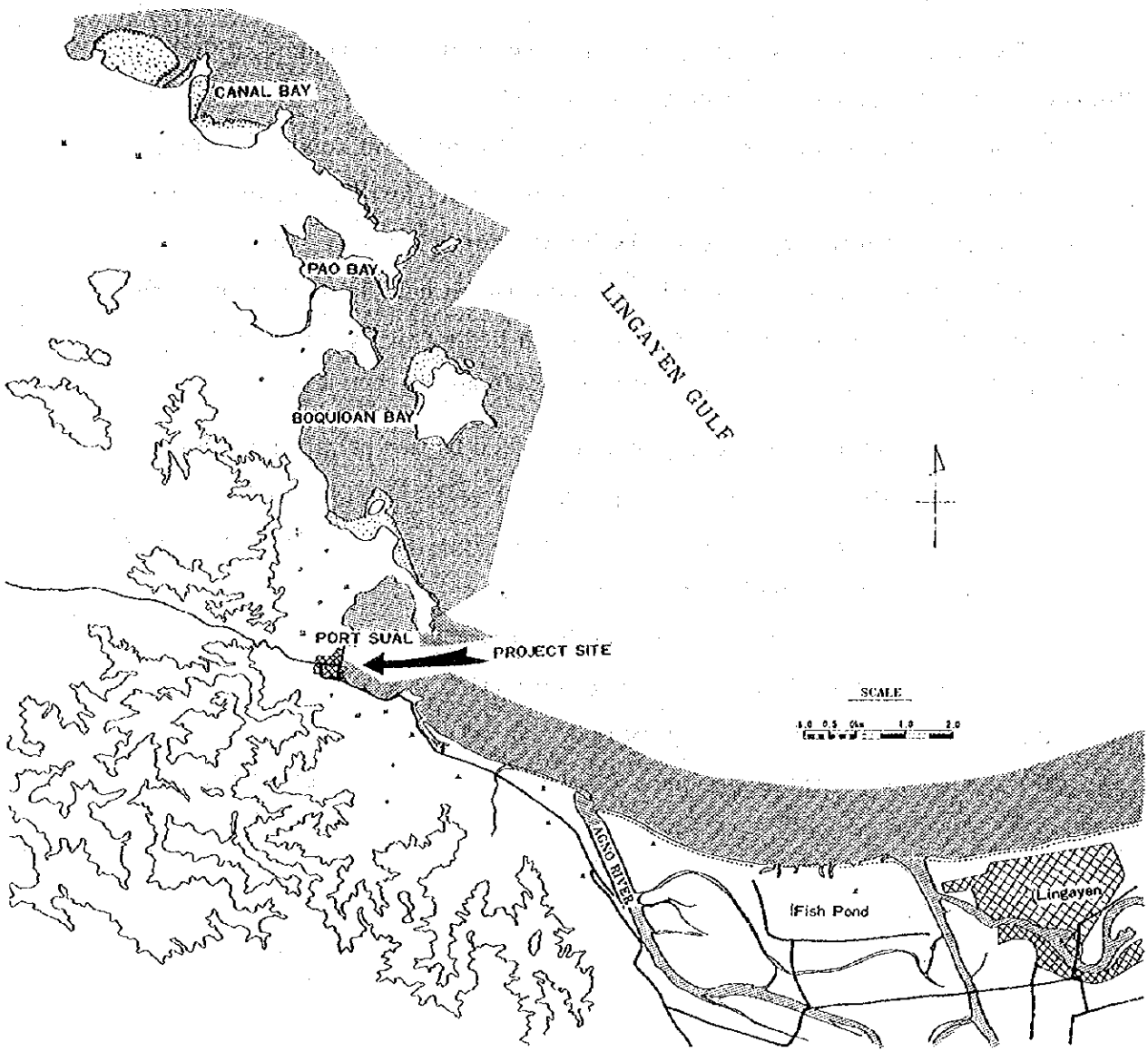


Fig. 6-1 Topographical Map of Sual, Pangasinan

Chapter 4 Plan of Basic Port Facilities

By the basic port facilities are referred to the facilities for protecting the fishing port from external forces having adverse effects upon the fishing port such as wave, littoral drift and current, facilities for mooring or landing the boats for the purpose of unloading the catches, supply of commodities or recess, and facilities for fulfilling the fundamental roles of the fishing port such as water surfaces allowing safe departure, return and anchorage or mooring of the fishing boats.

4-1 Project Facilities

Project facilities are as follows.

1. Mooring facilities
   (1) Landing quay (for trawlers)
   (2) Stair landing facility (for small boats)
   (3) Preparation quay (for trawlers)
2. Bulkhead (used also for mooring small boats)
3. Shipyard
4. Mooring basins

4-2 Plan of Mooring Facilities

4-2-1 Plan conditions for mooring facilities

Planning of the mooring facilities will be made with the following plan conditions taken into consideration.

(1) The landing and preparation quays for trawlers shall be of -3.0 m quay.

(2) The landing facility for small boats shall be a -2.0 m stair landing facility.

(3) Trawlers, after landing or preparation, shall be anchored on mooring basins. Small boats, after landing, shall be moored at the west

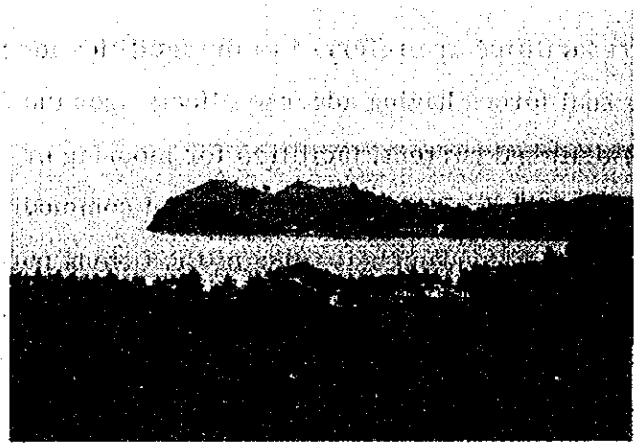


Photo 6-1 Sual Bay as the Sual Fishing Port Construction Project Site. Lingayen Gulf lies beyond the peninsula.

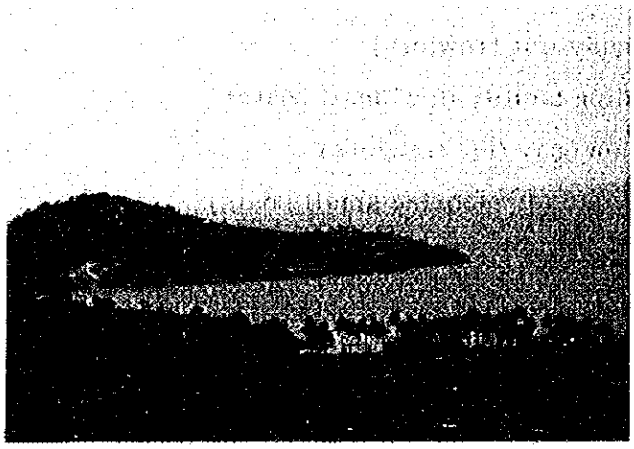


Photo 6-2 North side of Sual Bay viewed from a hilltop behind. A lighthouse of the Spanish era situated at the top of the peninsula. Natural good port.

Photo 6-3 A pier of Sual Fishing Port at the center of Sual Bay.

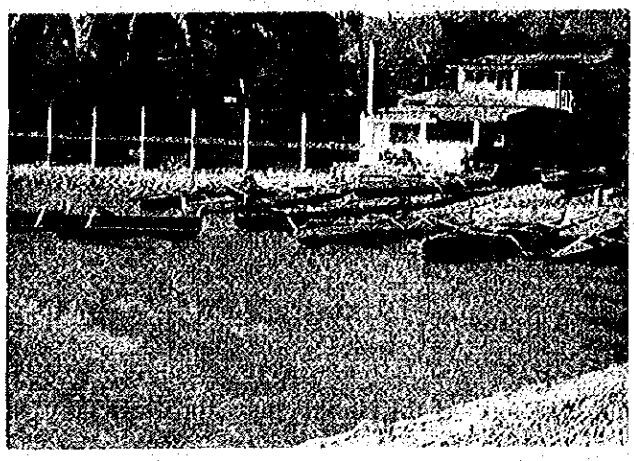


Photo 6-4 Bankers moored at the south of the Sual Fishing Port Pier

Photo 6-5 Shore at the north of the Sual Fishing Port Pier.

Photo 6-6 Japanese Mission investigating Sual Fishing Port. Mr. Hayashi, Head of the Misson, on the right near the center with a hat on his head.

bulkhead or any seashores they like.

4-2-2 Required length of mooring facilities

The required lengths of mooring facilities shall be as follows.

1. Required length of the landing quay for trawlers

The required length of mooring facilities are calculated as shown in Table 6-2.

Table 6-2 Required length of the landing quay for trawlers

Kind of Fishing Boat	Planned Number of Boats, A	Number of Sailing Days, B	Standard Number of Fishing Boats, C	Hours of use per Boat per Landing, D
Trawler	60 boats	5 days	12 boats	1.0 hrs.

Kind of Fishing Boat	Length of One Berth, E	Market Open Hours a Day, F	Quay Sufficiency Rate, G	Required Length of Quay $(\frac{C \cdot D}{F} \cdot E)\,G$
Trawler	18 m	6 hrs.	100 %	= 36 m

Notes: 1) Standard number of fishing boats:
The standard number of trawlers using the quay per day shall be as follows:

60 boats ÷ 5 days = 12 boats

2) Hours of use per boat per landing:
Calculation is

Hours of use per boat per landing operation

$$= \frac{\text{mean landing quantity per boat per operation}}{\text{Landing capacity}} + \text{Extra hours, or}$$

$$\text{Trawler} = \frac{4 \text{ tons}}{5 \text{ tons/hr.}} + 0.25 \text{ hr.} \fallingdotseq 1.0 \text{ hrs., and}$$

3) Quay occupying time per boat per time
It should be calculated as follows:

$$= \frac{\text{Mean landing volume per boat per time}}{\text{Landing capacity}} + \text{Extra time}$$

$$= \frac{4 \text{ tons}}{5 \text{ tons/hour}} + 0.25 \text{ hours} \fallingdotseq 1.0 \text{ hour}$$

4) One berth length:
Average size of trawlers is:
15.0 m long, 2.5 m wide, 1.8 m draft, 25 gross tonnage
Since trawlers are moored alongside the quay, one berth length shall be as follows:

15 m × 1.15 ≒ 18 m

5) Quay sufficiency rate:
Days of use of the trawlers number about 320 a year so that the quay sufficiency rate is taken as 100%.

2. Required length of stair landing facility for small boats

On the condition that boats are moored fore or aft at the facility, the length of the facility shall be 200 m.

3. Required length of the preparation quay for trawlers

On the condition that trawlers are moored alongside the quay, the length of quay per berth shall be about 19 m.

4-3 Other Facilities Planning

1. Shipyard

This is a slipway in which boats are arranged on land for small repairs, etc. The planned length shall be 65 m.

2. Bulkhead

The existing pier shall be applied, and the planned length shall be 137 m.

3. Mooring basins

Shallow water areas in front of mooring facilities, etc. shall be dredged, as mooring basins for fishing boats.

4-4 Layout and Utilization Plan

Since the fishing port is located on sand beach, the spoil of mooring basins shall be used for preparing the land for the fishing port economically. Therefore, the port should be of pier type, and on the west portion, the existing pier should be used.

The face line of quays should be set at the points where water depth can be maintained.

The arrangement of facilities and utilization plan of fishing boats determined in Section 4-1 to 4-3 are shown in Fig. 6-2. The detailed layout plan with land functional facilities, etc. is illustrated in Fig. 6-5.

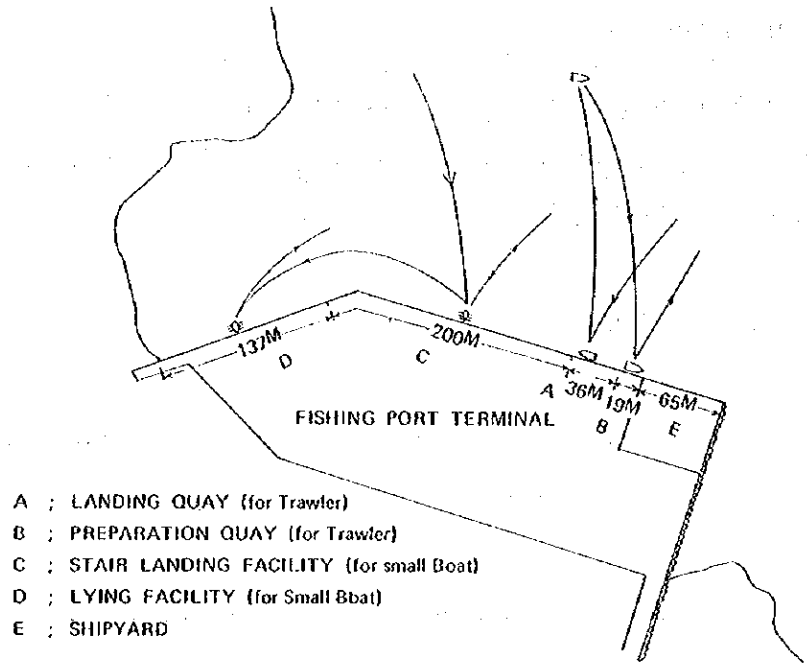


Fig. 6-2 Sual Fishing Port Basic Facilities Layout and Utilization Diagram.

Chapter 5 Plan of Functional Facilities

The functional facilities are referred to the facilities complementing the basic facilities and, at the same time, serving for reasonable execution of the works and services to be performed at the fishing port and thus enhancing the usefulness of the fishing port, and where the fish market and the ice plant and cold storage shall be constructed in the fishing port area, they are classified as one of the fishing port facilities.

5-1 Planned Facilities

Planned facilities include (1) fish market, (2) ice plant and cold storage, (3) water supply facilities, (4) fuel supply facilities, (5) roads, (6) parking area, (7) administration office, (8) fences and guardhouse, (9) power distribution and lighting facilities, (10) drainage facilities, (11) public toilet, and (12) land for fishing port facilities.

5-2 Plan Conditions and Required Quantities of Functional Facilities

5-2-1 Plan conditions of functional facilities

Planning of the functional facilities will be made with the following plan conditions taken into consideration.

(1) The ice plant and cold storage shall be installed at a location as possible to the fish market and the preparation quay for trawlers.

(2) As for water supply facilities, a water supply tank connected to the city's water supply system shall be installed, and pipings shall be arranged from there to the places where water is required.

(3) As for fuel supply systems, fuel tanks and fuel terminals shall be installed. Fuel supply to the fuel tanks shall be made by tank lorries from Lingayen City.

(4) Only one road shall be provided for connection to the outside of the fishing port, for the necessity of administration.

(5) Fences shall be built on the boundaries between the land of fishing port facilities and private land. At the boundary on the road leading outside, a gate and a guardhouse shall be built.

(6) As the land for fishing port facilities, sites for the various functional facilities shall be created.

5-2-2 Required sizes of functional facilities

1. Required sizes of main functional facilities (scale and capacity)

(1) Fish market

1) Standard amount of handling per day

Planned number of fishing boats is;

Trawlers 28
Small boats ..... 1,400 } (A)

Standard numbers of landing boats per day is;

Trawlers..... 28 boats + 5 ≒ 6 boats
Small boats..... 1,400 boats × 80% = 1,120 boats } (B)

Standard landing quantity per day is;

Trawlers ..... 6 boats × 4 tons/boat = 24 tons
Small boats... 1,120 boats × 15 kg/boat ≒ 17 tons } (C)

2) Processing capacity per m^2 of fish market

Catch from trawlers ..... 50 kg/m^2
Catch from small boats ..... 25 kg/m^2 } (D)

3) Required floor area of fish market

Catch from trawlers

(C) ÷ (D) = 24 tons ÷ 50 kg/m^2 = 480 m^2

Catch from small boats

(C) ÷ (D) = 17 tons ÷ 25 kg/m^2 = 680 m^2

Total: Approx. 1,200 m^2

4) Scale of fish market

Steel-framed, aluminium sheets roofing building of 20 m × 60 m. (1,200 m^2)

(2) Ice plant and cold storage

1) Ice plant

The volume of ice supplied to boats is assumed to be as much as the volume of fish landing by trawlers. The volume of ice used by the fish market per day is assumed to be a half of the volume of fish landing.

Ice making capacity: 24 tons×1+(24 tons+17 tons)1/2=45 tons

2) Ice storage

The volume of ice stored shall be as much as the volume of ice made per day, viz. 45 tons. (at -5°C)

3) Cold storage

Freezing volume per day: 24 tons x 0.2 ≒ 5 tons/day (E)

Stored volume: (E) × 10 days = 5 tons/day × 10 days = 50 tons (at - 25 C)

(3) Water supply facility

Table 6-3 Water supply calculation table

Classification	Water Supply per Day	Water Supply per Hour
Supply to fishing boats		
Trawlers	1.65 t/boats × 6 boats = 9.9 t	32.3 t – 6 hrs = 5.4 t/hr
Small fishing boats	0.02 t/boats×1.120 boats= 22.4 t	
Ice Plant & Cold Storage	35 t	35 – 24 = 1.5 t/hr
Other use	6 t	6 – 12 = 0.5 t/hr
Total	73.3 tons/day	7.4 tons/hr

Water shall be supplied from the city's water supply system, and one pressure tank connected to the water supply system shall be installed, with pipings arranged to the places where water is required.

(4) Fuel supply facilities

1) Fuel supply

Numbers of objective fishing boats of fuel supply (B):

Trawlers ..... 6 boats

Small boats ..... 1,120 boats

Fuel supply per boat per time (F):

Trawlers ..... 5.016 kℓ/boat

Small boats ..... 0.019 kℓ/boat

Fuel supply per day

Trawlers

(B) × (F) = 6 boats × 3.420 kℓ/boat ≒ 21 kℓ/days

Small boats

(B) × (F) = 1,120 boats × 0.019 kℓ/boat 23 kℓ/day

Total: 44 kℓ/day

2) Quantity of fuel stored

Quantity of fuel supplied for two days should be stored.

44 kℓ/day × 2 days ≒ 88 kℓ

One fuel tank for 100 kℓ shall be installed in the fuel tank yard, with pipings arranged to the fuel terminals on the quays.

Note: Quantities of fuel supplied per boat per time is calculated as follows:

Table 6-4 Fuel supply amount per boat per time.

Classification	Trawler	Small fishing boat
Fishing boat horse power	150 HP	10 HP
Main fuel consumption/ hr/HP	0.19 kg/hr/HP	0.19 kg/hr/HP
Average running hours/ navigation/boat	5 × 24 = 120 hrs	10 hrs
Main fuel supply/ time/boat	3,420 kℓ/boats	0.019 kℓ/boat

2. Scales of other functional facilities

(1) Road

The access road connected to the outside of the fishing port area shall be 15 m wide, and the road within the area shall be of a width of 10 m and asphalt paved.

The road shall be provided with drainages and gutters.

(2) Parking area

At the back of the fish market, a parking area (asphalt pavement) should be provided with drainages.

(3) Administration office

One two-storied reinforced concrete building with total floor area of 800 m^2 shall be built.

(4) Fences and guardhouse

Fences with total length of 440 m, a gate and one guardhouse with floor area of 50 m^2 shall be built.

(5) Power distribution and illumination facilities

With the electric power supplied from the city, the power distribution lines within the fishing port area shall be installed. Illumination lights should be installed where they are required.

(6) Public toilet

A toilet buildings, with a floor space of 100 m^2, shall be installed.

(7) Land for fishing port facilities

About 5.4 hecrares of land shall be created as the site for the foregoing functional facilities and the lot for commercial area and net and gear area.

5-3 Layout Plan

Layout or arrangement of the facilities specified in Section 5-2 is as shown in Figs. 6-3 and 6-4. A detailed layout plan including the basic facilities is illustrated in Fig. 6-5.

SUAL FISHING PORT

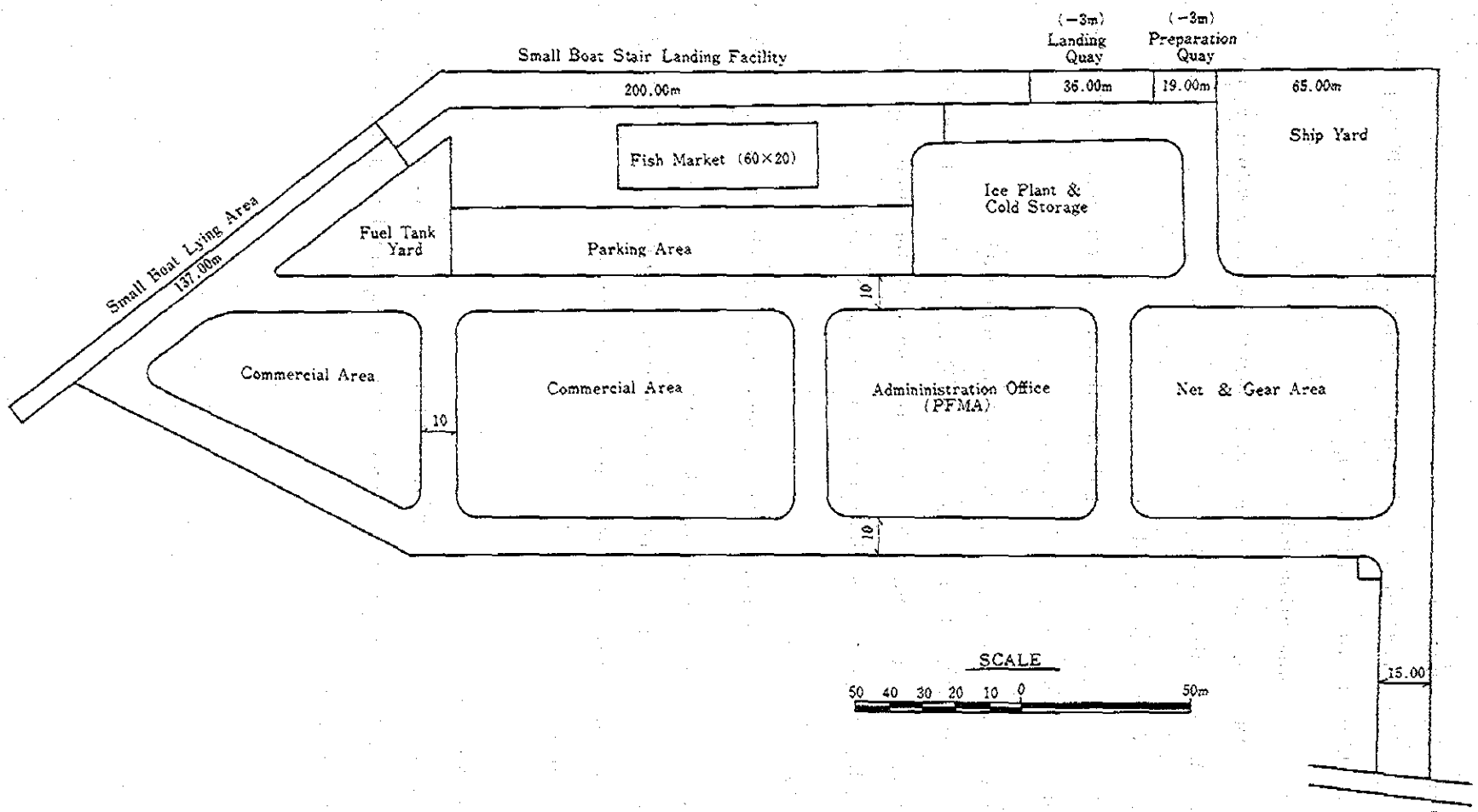


Fig. 6-3 Arrangement of Functional Facilities, Sual Fishing Port

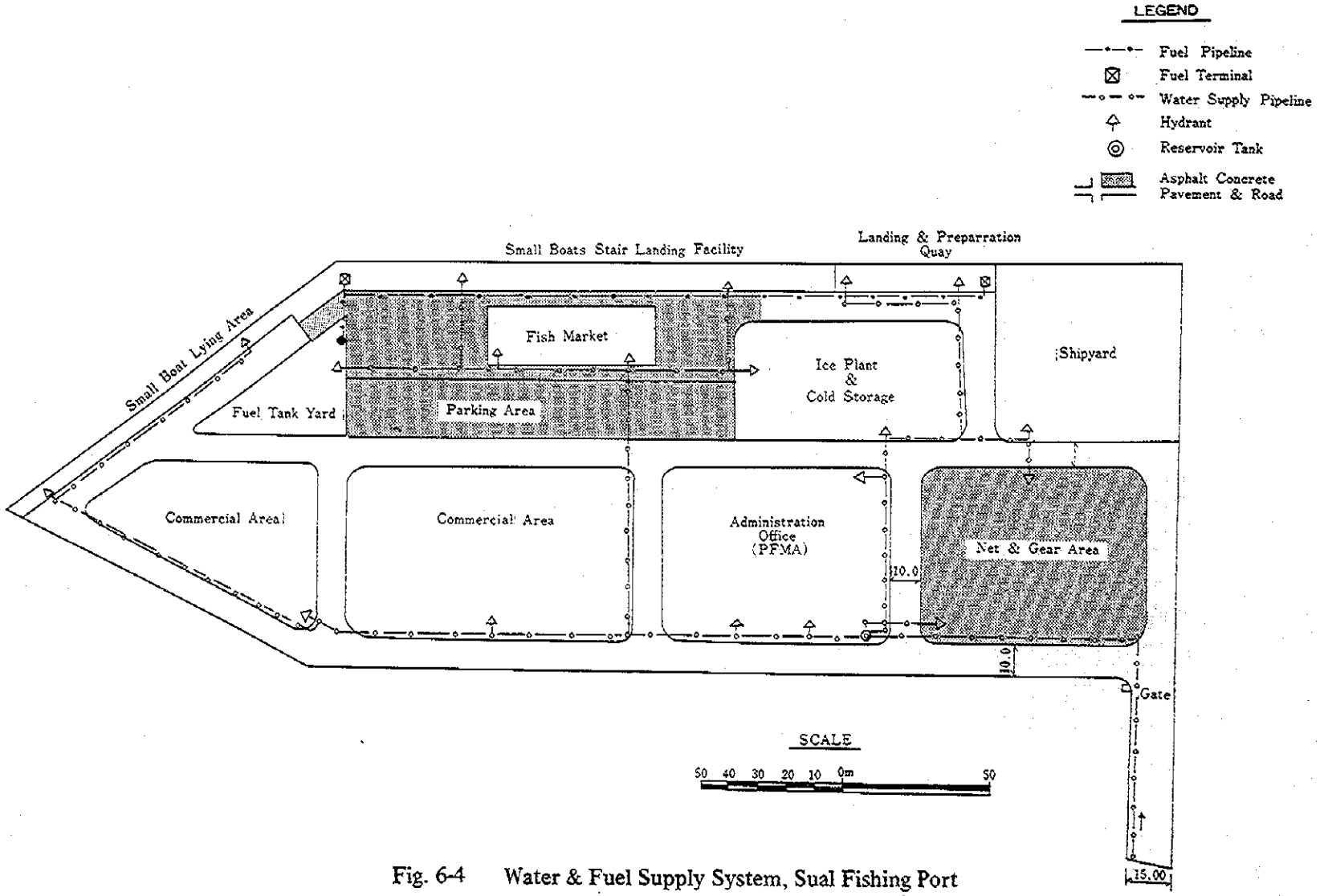


Fig. 6-4 Water & Fuel Supply System, Sual Fishing Port

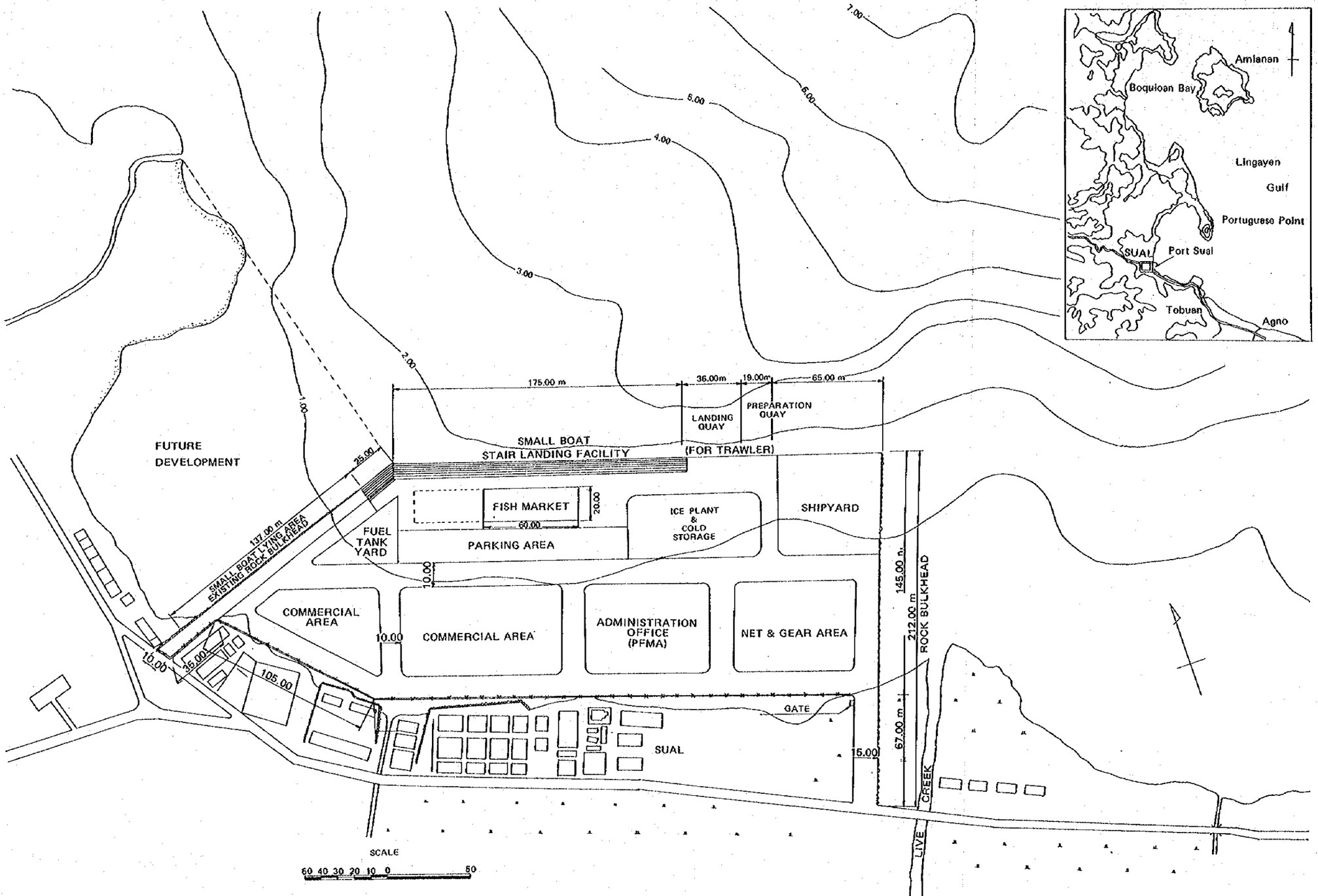


Fig. 6-5 Master Plan of Sual Fishing Port

Chapter 6 Structural Design of Principal Facilities

6-1 Design Conditions

Design conditions used for design of quays and other principal facilities are summarized in the following.

(1) Design seismic intensity (Kh)

$$Kh = z.k.c$$

where z: Regional seismic intensity (or z = 1.2) according to the "Seismic Data in the Philippines", shown in Fig. 5-6;

k: Structural important coefficient (or k = 1.0); and

c: Seismic coefficient (or c = 0.1).

Then,

$$Kh = 1.2 \times 1.0 \times 0.1 = 0.12 \text{ or nearly } 0.1.$$

(2) Soil conditions

In reference to the soil survey data "Sual Fishing Port, Pangasinan", a soil survey report executed by the Government of the Philippines in Sual district, the soil conditions shall be estimated as shown in the subsoil condition columnar diagram of Fig. 6-7.

(3) Objective fishing boat

Objective boats are trawlers and small fishing boats, and the respective sizes are as shown in Table 6-5.

Table 6-5 Type parameters of objective fishing boat

Kind of Fishing Boat	Length Overall	Extreme Breadth	Draft	Gross tonnage
Trawlers	15.0 m	2.5 m	1.8 m	15.0 tons
Small Fishing Boats	7.0	4.0	0.6	2.5

(4) Tide condition

In the absence of the records of observation at the site, the design

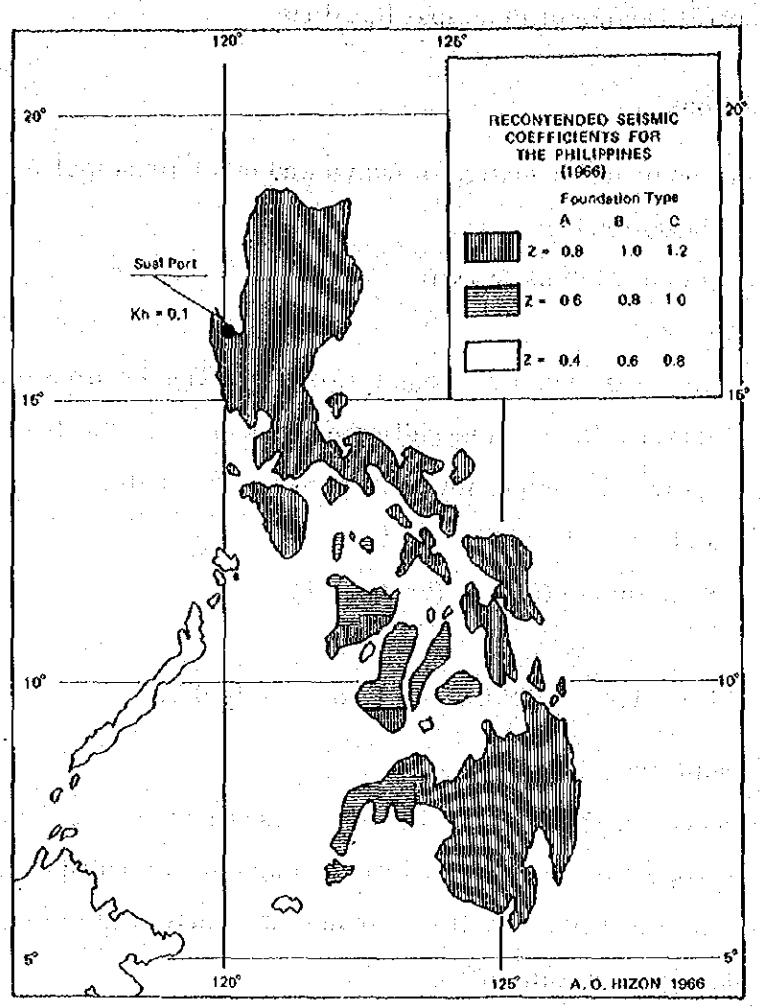


Fig. 6-6 Seimic Condition of the Philippines

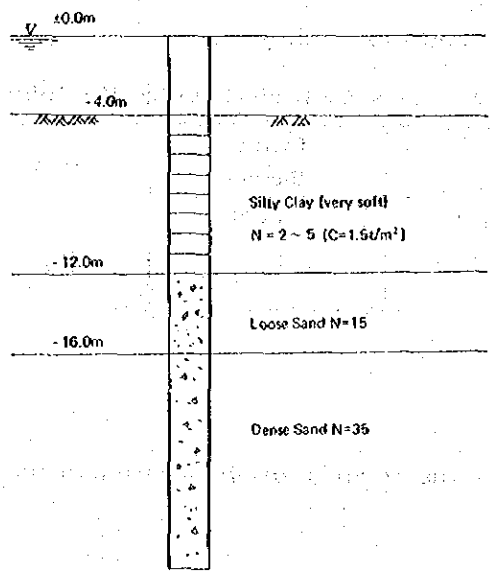


Fig. 6-7 Estimated Sub Soil Condition of Sual Port

tide levels shall be determined as shown below from the "Tide and Current Table, Philippines" (published by the Bureau of Coast & Geodetic Survey) and the charts.

H.H.W.L. +0.710 m

H.W.L. +0.710 m

(0.683 + 0.03 = 0.713)

L.W.L. ± 0.00 m

The tide level information described on the charts is:

Sual port

H.W. (spring tide)	2.4 ft (0.73 m)
H.W. (neap tide)	-
L.W. (spring tide)	0.2 ft (0.06 m)
L.W. (neap tide)	-
High tide level at spring equinox (average)	3.7 ft (1.13 m)
Low tide level at spring equinox (average)	-0.7 ft (-0.21 m)

(5) Design wave height

Since no wave observation record at the fishing port construction site is available, the design wave height is to be estimated. Considering the form, mouth position and opening direction of Sual bay, strong wind direction, etc., it is estimated that wave rises little. However, considering the worst situation, H_{max} = 0.5 m should be used as the design wave height.

(6) Other design conditions

The other design conditions considered for design are as follows.

1) Crown height

Quay and stair landing facility	DL +2.5 m
Revetment	DL +3.0 m
Reclaimed land	DL +2.5 m

2) Design water depth

Maximum draft of objective fishing boats (A)	1.8 m
Allowance (B)	1.2 m

Design water depth (A + B) -3.0 m

3) Surcharge load 1.0 ton/m^2

Quay and bulkhead 0.5 tons/m^2

4) Internal friction angle of backing cobble $\phi = 30°$

5) Property of bearing ground

Silty clay N value 2 to 5

($C = 1.5$ tons/m^2)

Sand (loose) N value 15

6-2 Selection of Structures of Main Facilities

6-2-1 Points noted in selection

In selection of the structures of the principal basic facilities, the following points are to be noted.

(1) Since it is required to complete the work in a short period and start the use as soon as practicable, such a structure should be chosen which is simple, of good workability and stabilized in a short time.

(2) The land for fishing port facilities shall be created entirely by reclamation with spoil so that it is required to construct sub-bulkheads in the water.

(3) The structures should allow the use of the construction machinery existing in the Philippines as far as possible, and avoid the use of special construction machinery as far as possible.

(4) The structures should allow the use of construction materials available locally as far as possible.

(5) The quays shall be of sheet pile structure, and from the workability, reliability and durability, steel sheet piles are to be used.

6-2-2 Structural elements of principal basic structures

Structural elements of the principal basic structures are as given below.

(1) -3 m quay .... Steel sheet pile structure (see Fig. 6-8)

Main body .... Steel sheet pile (U-III type), ℓ = 11.0 m

Embedment -9.0 m

Tie rod .... ϕ 30 m/m

Apron ..... Effective width 10.0 m, Concrete pavement, 20 cm thick

Anchor ..... Steel sheet pipe (U-IIA type), 6.0 m long

(2) -3 m stair landing facility .... Concrete structure (see Fig. 6-9)

Main body .... Concrete stairs work

Foot protection .... Precast concrete blocks

(3) Bulkhead (see Figs. 6-10 and 6-11)

Main body .... Rubble-mound foundation (reclaimed bulkhead turned for use)

Concrete coping (with mooring bitts) Apron pavement of a width of 5.5 m provided in the back of the wall.

(4) Shipyard ..... Concrete structure (see Fig. 6-12)

Body ..... Concrete blocks beneath the depth of ± 0.0 m.

In-situ concrete above the depth of ± 0.0 m.

(5) Others

Just for reference, the standard cross section of concrete sheet pile quay used for design comparison is shown in Fig. 6-13.

The unit construction costs which are calculated at comparative designing are listed as follows;

-3 m Steel sheet pile structure type of quay .... 4,333 US$/m

-3 m Reinforced concrete sheet pile structure type of quay .... 4,947 US$/m

This unit costs are calculated at the completion of quay.

The -3 m quay of Zamboanga port is designed by using steel sheet pile structure for the reasons of its economy, workability, reliability and durability against reinforced concrete sheet pile structure.

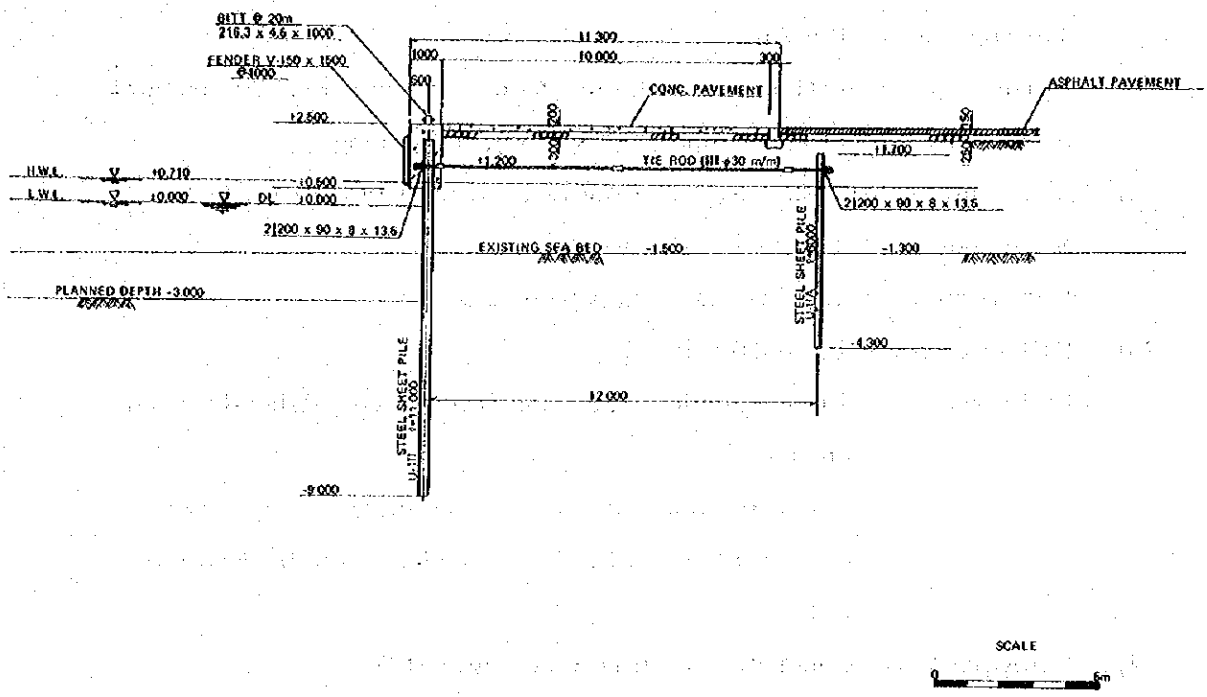


Fig. 6-8 Cross Section of Landing Quay – Sual Port

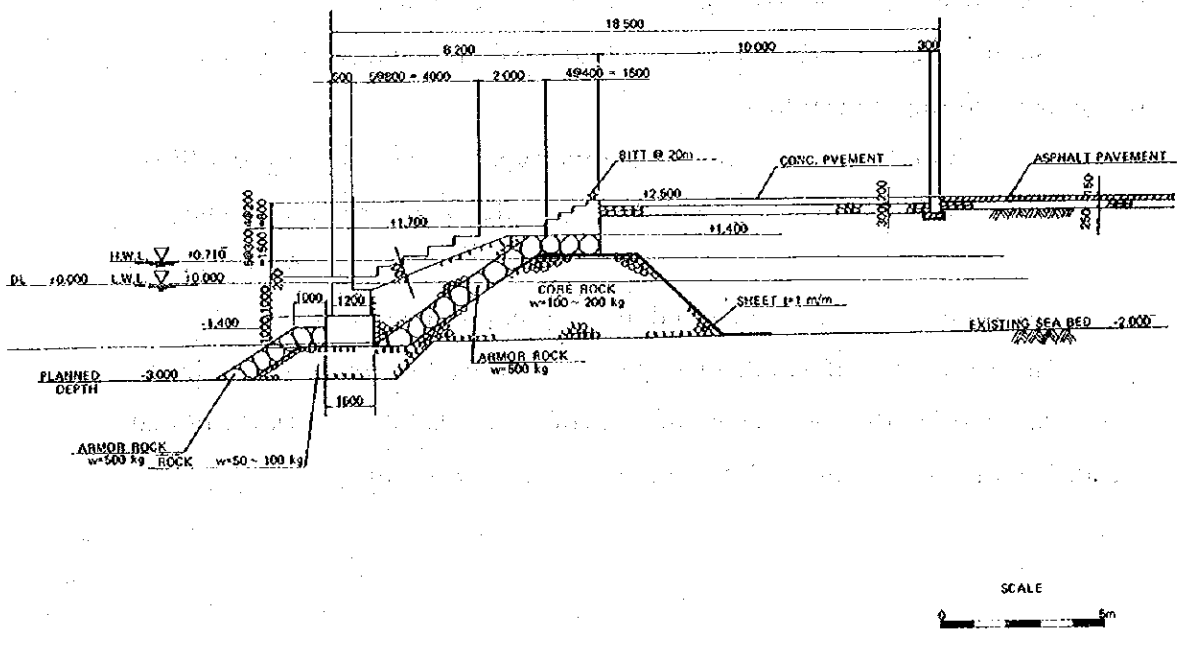


Fig. 6-9 Cross Section of Stair Landing – Sual Port

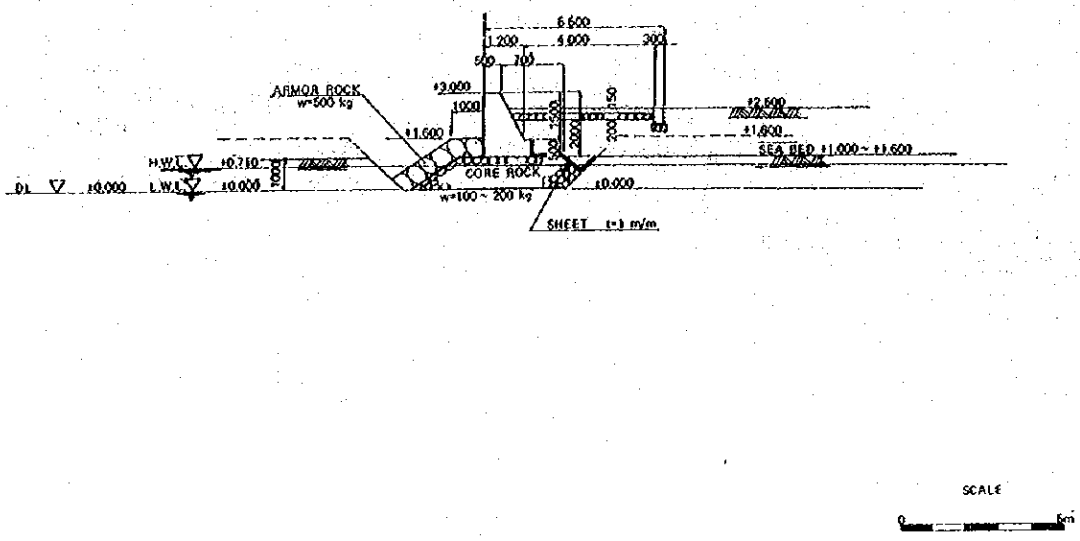


Fig. 6-10 Cross Section of Rock Bulkhead (1) – Sual Port

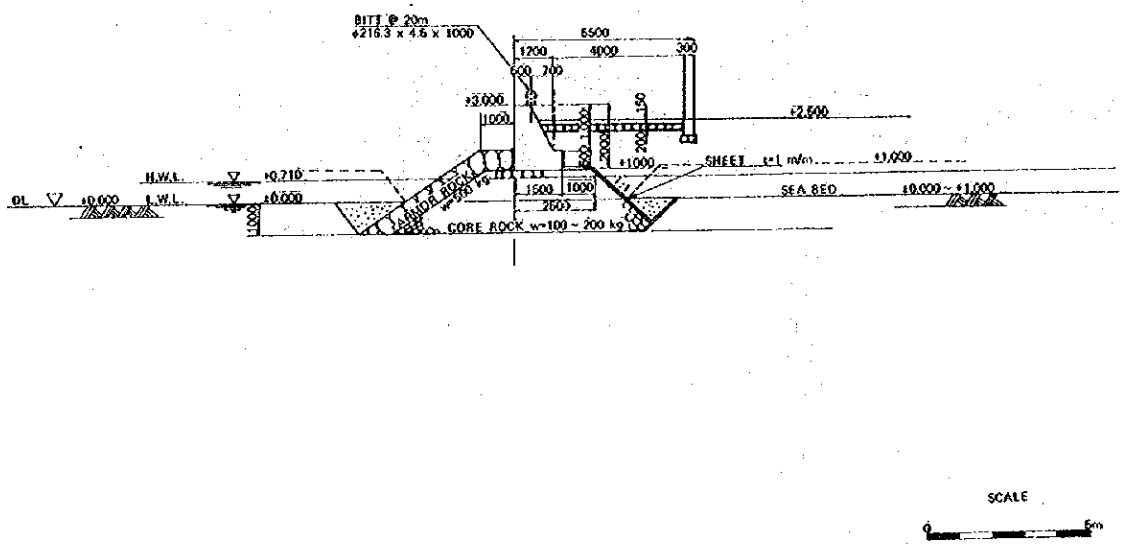


Fig. 6-11 Cross Section of Rock Bulkhead (2) – Sual Port

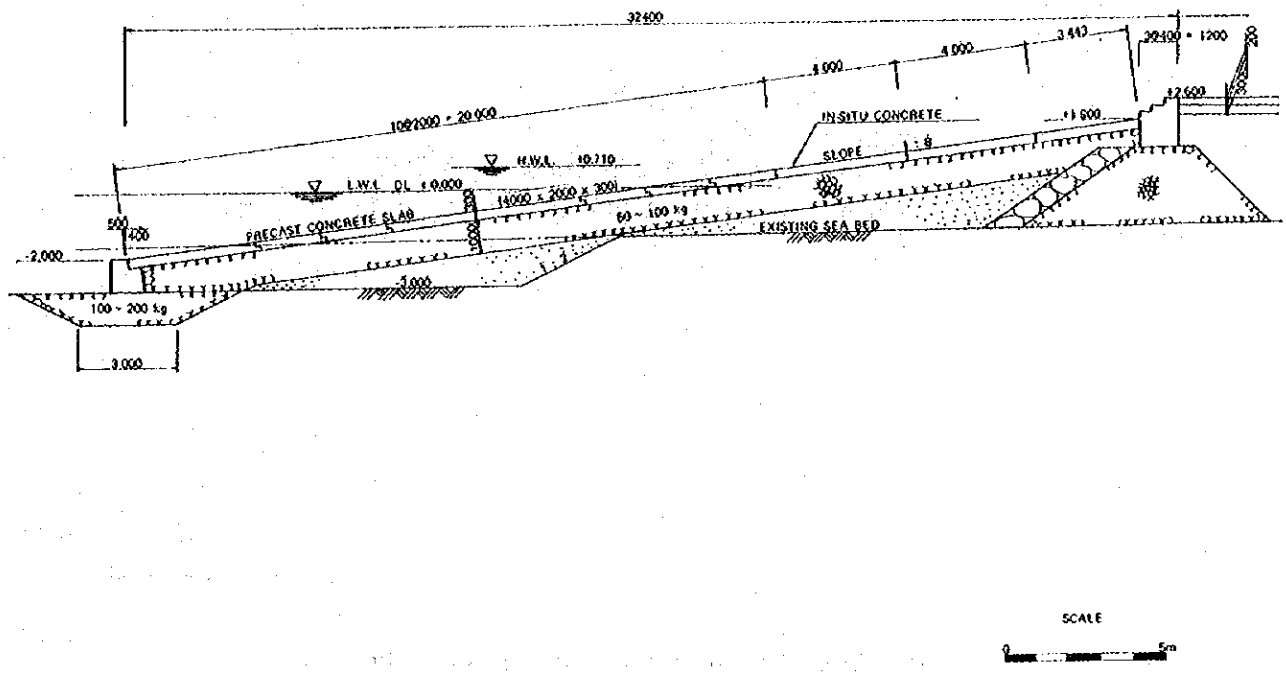


Fig. 6-12 Cross Section of Basnig Landin – Sual Port

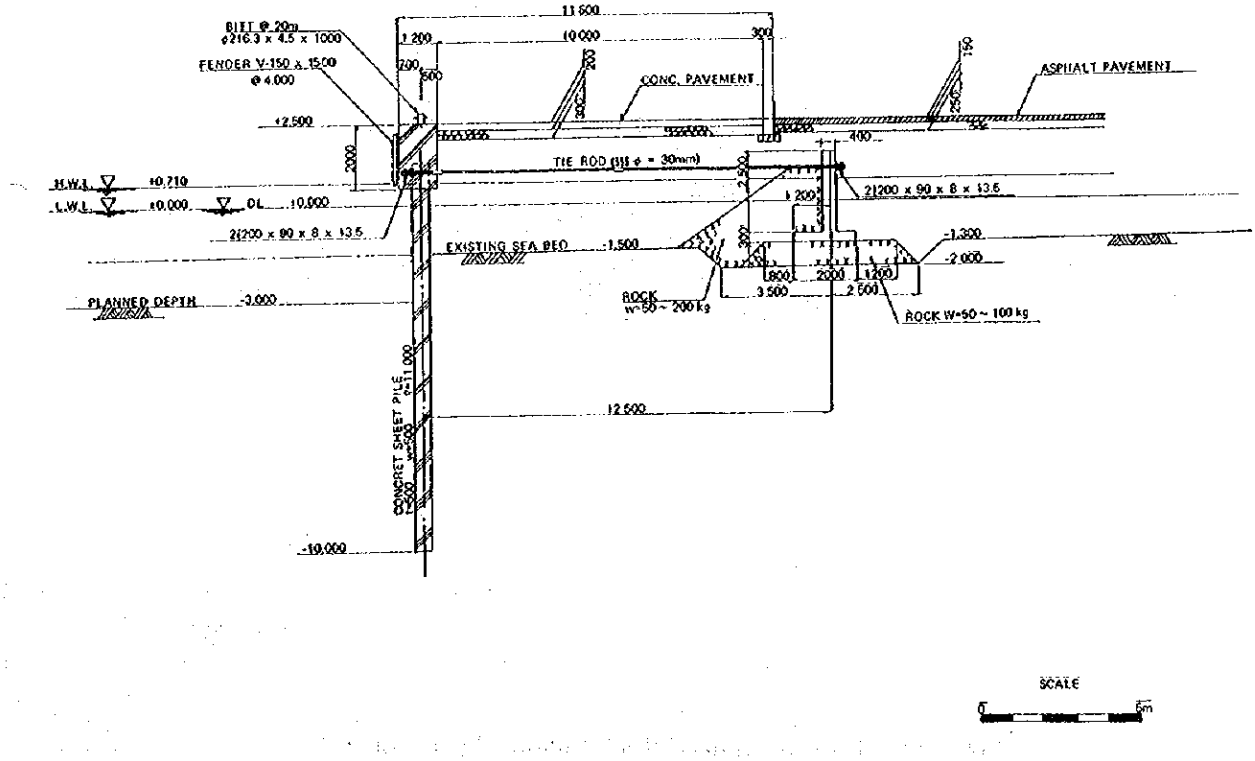


Fig. 6-13 Cross Section of Landing Quay – Sual Port
(using for comiparative designing)

Chapter 7 Construction Program

7-1 Work Program

7-1-1 Principles

The construction program should be made with consideration given to the work schedule so that the work period being two years, the respective works are started as soon as practicable and that from the urgency of use of the facilities and the viewpoint of effective utilization of them, not only the basic facilities but the functional facilities can be placed in use soon.

Further, in implementing the construction program, consideration should be made so that the demand for facilities at the respective target years would be met satisfactorily.

Moreover, at the construction site, the catch landing and other works are actively carried out presently. Thus, it is required to give consideration to these activities so that they are as scarcely hampered as possible.

7-1-2 Securing workers for construction and procurement of materials and machines

(1) Securing the construction workers

The unskilled workers to be engaged in construction are difficult to secure only in and around the construction site, and they must be secured in Lingayen district, etc. In this case, transportation of workers by micro-bus, etc. must be considered.

Recently, large-scale construction work has not been made in this neighborhood, and it is difficult to secure skilled workers for general work items such as port construction and related works. They must be introduced from other districts.

(2) Procurement of construction materials

For procurement of the important materials among the construction materials in general.

1) Core, backfill and foundation cobble

(3) Procurement of construction materials

Of construction materials, availability of main materials is as follows:

1) Rubble for filling, back-filling and foundation

Large volume of rubble exists in the hills behind Sual district, and can be easily procured.

2) Sand and gravel for concrete

As for sand, the pit sand existing in surrounding hills can be used as in case of rubble. As regards gravel, it is advisable to use crushed stone. Though pit gravel can be obtained, there remains doubt as to quantity available.

3) Earth and sand for back-filling

The spoil produced by dredging the mooring basins should be turned for use.

4) Cement

As regards cement, domestically made cement is supplied stably, and has any problems neither in quantity nor quality. Therefore, it should be turned for use.

5) Steel

Steel for steel sheet piles, tie rods, reinforcement, etc. must be supplied stably and must be even in quality. Therefore, it should be imported.

6) Forms and supports

Wooden forms, supports and other temporary materials are all procurable domestically.

7) Other special materials

Cables, electrical wires, electrical equipment, plants and machines will be dependent on the import.

(4) Procurement of construction machinery

The following construction machines can be procured in and around Manila,

and therefore should be procured domestically.

1. Pump dredger
2. Pontoon and pontoon for crawler
3. Dump truck
4. Batcher plant
5. Crushing plant

The following construction machine should be imported from the outside of the country.

1. Crawler crane

7-1-3 Facilities necessary for construction

(1) Temporary road for construction

An approximately 50 m temporary road for construction should be built.

(2) Temporary office, etc.

As soon as the construction starts, an office of construction staff, warehouse, material yard, construction machinery yard, etc. must be constructed.

(3) Water supply, electrically, telephone and other facilities

These facilities should be completed by the city or the Government, from the city to the construction site, before the construction starts.

7-2 Project Schedule

The project schedule is illustrated in Table 6-6.

Table 6-6 Project schedule – Sual fishing port

Completion Time 24 month

Item	Q'ty		Number of Months (6 / 12 / 18 / 24 / 30)
Mobilization	LS	1	
Port Work			
Landing Quay	m	120	
Stair Landing Facility	m	200	
Rock Bulkhead	m	352	
Dreding & Reclamation	m^3	189,000	
Functional Facilities			
Building Work	LS	1	
Road & Pavement	LS	1	
Miscellaneous Work	LS	1	

7-3 Estimation of Construction Cost

7-3-1 Concept for cost estimation

Estimation of the construction cost is made according to the following concept.

(1) Estimation of the construction cost is made on the 1978 prices.

(2) Unit prices of the construction materials and those of labourers used in the estimation are determined with the Standard Material Unit Prices and Standard Labour Wages (1977) of the Government of the Republic of the Philippines taken as the base and the material unit prices and labour wages obtainable upon survey at the fishing port project site taken as a reference.

(3) For the imported materials, the unit prices are obtained at the price of CIF plus domestic transportation cost in 1978.

(4) Exchange rate between local currency and foreign currency is as follows:

US$1.0 = 7.22₱

= ¥220

(5) Since the soil exploration at the construction site is not conducted yet, the design conditions may have to be changed, causing some design change on main structures, depending on the result of soil exploration to be made. Therefore, 15% was appropriated as the contingency.

7-3-2 Calculation of construction cost

The construction cost necessary for improving Sual fishing port is as shown in Table 6-7.

Table 6-7 Construction cost of Sual fishing port

	Unit	Quanty	Unit Price (US$)			Total (US$)		
			Local	Foreign	Amount	Local	Foreign	Amount
(Preparatory Work)						(155,525)	0	(155,525)
Site Clearance	m^2	67,500	0.23	0	0.23	15,525	0	15,525
Temporary Jetty	L.S	1				140,000	0	140,000
(Mobilization)	L.S	1				(45,000)	(91,000)	(136,000)
(Port Work)						(690,307)	(1,105,904)	(1,796,211)
Landing & Preparation Quay	m	55 *1)	433	3,899	4,332	23,815	214,445	238,260
Stair Landing Facility	m	200	1,355	1,064	2,419	271,000	212,800	483,800
Rock Bulkhead	m	352 *2)	506	382	888	178,112	134,464	312,576
Dredging & Reclamation	m^3	189,000	0.56	2.24	2.80	105,840	423,360	529,200
Shipyard (Functional Facilities)	m	65	1,716	1,859	3,575	111,540 (2,007,844)	120,835 (941,931)	232,375 (2,949,775)
Fish Market	m^2	1,200	155.38	90.98	206.36	138,456	109,176	247,632
Administration Office	m^2	800	641.02	0	641.02	512,816	0	512,816
Public Toilet	m^2	100	641.02	0	641.02	64,102	0	64,102
Roads & Pavement	m^2	24,440	28.64	0	28.64	699,962	0	699,962
Electrical	L.S	1				76,900	212,300	289,200
Drainage	m	2,654	48.66	0	48.66	129,144	0	129,144
Water System	L.S	1				167,500	53,500	221,000
Fuel System	L.S	1				36,300	171,500	207,800
Fence & Gate	L.S	1				16,300	0	16,300
Ice Plant & Cold Storage	L.S	1				166,364	395,455	561,819
Sub Total						2,898,676	2,138,835	5,037,511
Tax & Duties	L.S	1				463,209	0	463,209
Contingency	%	15				504,282	320,825	825,107
Total						3,866,167	2,459,660	6,325,827

Note: *1) The preparation quay length for trawlers is 19 m, and 36 m is landing quay.

*2) Total length of 352 m include 137 m of west rock bulkhead, 212 m of east rock bulkhead and 3 m of transitional part.

Chapter 8 Economic Analysis

8-1 Economic Background of Sual Fishing Port

Sual fishing port is located in the west of Pangasinan province, away from the urban center (where population concentrates around Dagupan City and San Carlos City). This fishing port is used by small bankers and trawlers.

In and around Sual district, living units gathering as fishing villages are not observed, but the houses of fishermen scatter here and there. The fact, that almost all marine fisheries are composed of municipal fisheries, means that fishing villages do not exist. Not only Sual district but also Pangasinan province as a whole greatly relies on inland fishery, and marine fishery is observed only slightly. Furthermore, commercial fishery is very limited, and the sudden expansion of marine fishery is relatively difficult in this district.

In light of demand, the shortage of fish is serious, and the earlier development of commercial fishery including the introduction of large fishing boats is needed.

Sual port can be said a fishing port to protect small fishermen operating small boats in Lingayen Gulf and to develop offshore fishery.

In this analysis to be made from the viewpoint of the national economy, serious note will be taken of the aforementioned characteristics and an attempt will be made to analyze the form in which the intention of the Government of the Philippines to replenish the domestic fish demand may be realized by the development of a fishing port and the degree to which the effects of the development may be brought about from the economic point of view.

In general terms, the benefits of a fishing port consist of the following factors:

(1) Reduction of the time required for the fishing boats to come in and go out of the port through relief from congestion in the port;

(2) Increasing catches with increasing expedition of the fishing boats;

(3) Improvement in the freshness of fishes through increasing supply of

ice and technological inovation;

(4) Realization of powered and larger fishing boats upon completion of a modern and larger scale fishing port (modernization of the fishery by functional accumulation);

(5) Increasing income of fishermen due to elevation of the average fish prices;

(6) Improvement in the rate of self-sufficiency of proteins;

(7) Stabilization of the fish prices from stable supply of fishes;

(8) Creation of employment opportunities and urbanization effect; and

(9) Acquisition of new techniques, and acceleration of the fishermen association;

The analysis will be made mainly with respect to the benefits (2) and (3) which permit quantifying among the benefits listed above.

8-2 Demand and Supply of Fish in Pangashinan Province

8-2-1 Market territory, and recent outputs of and demands for fishes

An important market of Sual fishing port is the center of Pangasinan Province around Dagupan City and San Carlos City. Here are analyzed the demand and supply in Pangasinan Province.

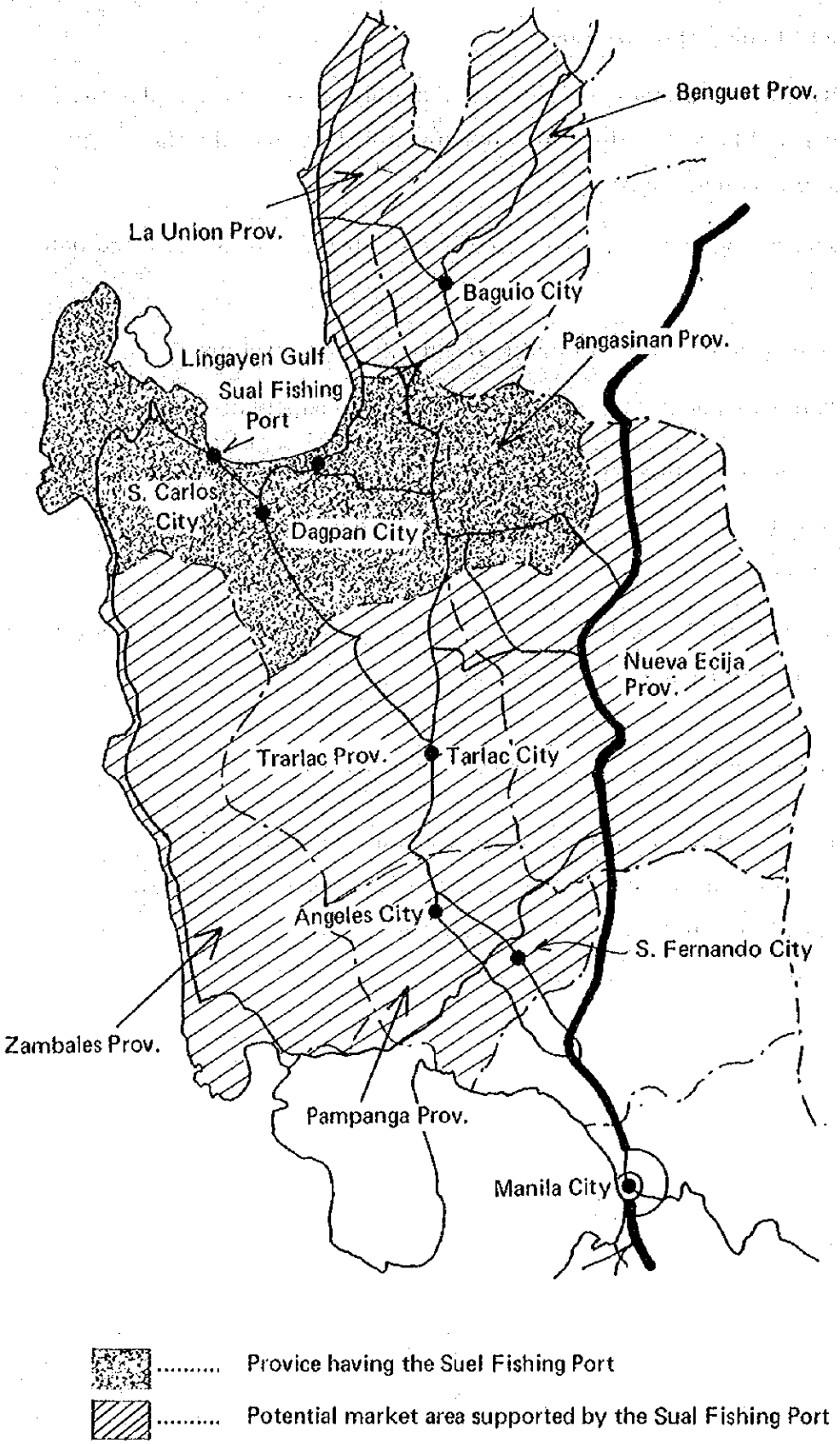


Fig. 6-14 Objective market territory of Sual fishing port

The volumes of fish landings and demand in 1976 in Pangasinan Province are as shown in Table 6-8. Inland waters fishery accounts for 72% of the total volume of fish landing, showing a regional feature of remarkable dependency on inland waters. Ninety six percent (9,200 tons) of the volume by sea fishery was covered by municipal fishery, showing that this district is considerably behind the time in commercial fishery.

In Pangasinan Province, demand exceeds fish catches, and they rely upon fish supply rom the outside of the province.

Table 6-8 Details of fish supply and demand (1976)

tons

Supply and Demand / Kinds	Annual output	Demand in the province	Net domestic & foreign exports
Marine Fisheries	9,700		
Inland Fisheries	25,000		
Total	34,700	45,500	▲ 10,800

Note: 1) The demand in the province was obtained, with the 1976 population of 1,537,000 used, according to the formula

$$D_n = C_0 (1 + y \cdot e)^n \cdot P_n$$

where D_n : Effective demand in the n-th year with 1975 taken as a base year;

C_0 : Basic consumption in the reference year (28.9kg);

y : Real per capita income growth rate (6%);

e : Income elasticity of demand for fish (0.4);

P_n : Population of the n-th year (with 1975 as the base year).

2) Data: By Bureau of Fisheries and Aquatic Resources.

8-2-2 Analytical conditions

The analytical conditions are considered as follows.

(1) The output of the municipal marine fisheries will continue to maintain the present level.

(2) The inland fisheries will have no increase in the output but continue to maintain the present level.

(3) No fishes are assumed to be brought in the province from outside and sent from the province to outside.

8-2-3 Analysis of the change in the balance of demand and supply

Under the foregoing present situation and analytical conditions, analysis of the balance of demand and supply in the future (for the two cases, with and without the fishing port) is made according to the following procedures.

(1) Forecast of population

Populations in the future are forecasted, upon the pattern of change of the population in 1960 - 1975, as shown in Table 6-9 and Fig. 6-15.

Table 6-9 Traditional change and forecasted values of population in Iloilo Prov.

Unit: 1,000

Year / Area	1960	1970	1975	1981	1990	2000
Sual	21	24	26	26	26	26
Other Area	1,103	1,362	1,483	1,654	1,884	2,154
Total	1,124	1,386	1,509	1,680	1,910	2,180

Data 1 "Philippine Statistical Year Book" 1977, NEDA
2 Other information by the Pangashian Prov. Gov.

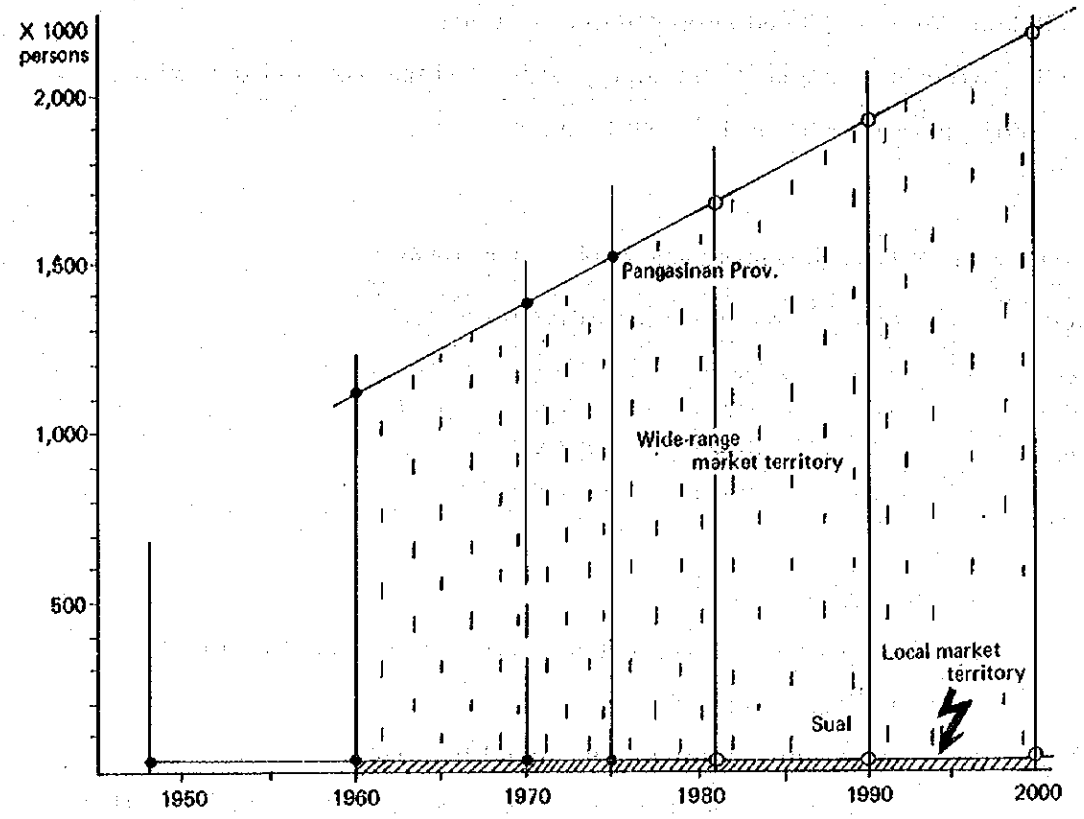


Fig. 6-15 Population change and forecast

(2) Forecast of demand for fishes in the province

Demand forecasts of the objective market territory (Pangashinan Province) are, if the forecast is made for the local market territory (Sual) and for the wide range market territory (whole area of Pangashinan Province except Sual), as shown in Table 6-10.

Table 6-10 Demand forecast of fish in Pangashinan Prov.

tons

Market territory / Year	Local market territory	Wide range market territory	Objective market territory
1975	751	42,859	43,610
1981	866	55,114	55,980
1990	1,072	77,697	78,769
2000	1,359	112,612	113,971

Note: The demand forecasting method is the same to that for Table 6-8.

(3) Balance of demand and supply in the province

The balance of demand and supply with a fishing port and that without a fishing port are shown in Table 6-11.

Table 6-11 Balance of demand and supply in the province.

tons

Project	Year	Supply (S)	Demand (D)	S/D
With Port	1990	47,400	78,800	0.60
	2000	59,200	114,000	0.52
Without Port	1990	39,200	78,800	0.50
	2000	39,200	114,000	0.34

Note 1. Supply (S): $S = (Y_0 + Y_1) - E$

Y_0 : Output (commercial fisheries) at fishing port (with or without fishing port).

Y_1 : Output of municipal and inland fisheries.

E : Flow out of the province (net domestic and foreign exports)

2. Demand (D): Provincial demand specified in paragraph (2).

8-3 Economic Evaluation

8-3-1 Concept of analysis

The analysis will be made along the following lines.

(1) The effect of the fishing port development will be taken as the difference between the case where the fishing port is present and that where the fishing port is not present.

(2) For the costs, the construction, personnel, maintenance and facility renewal costs will be taken up.

(3) For the benefits, analysis will be made of the direct benefits, more specifically, 1) increase in the output of fish catches and 2) improvement in the freshness of fishes due to increased supply of ice and technological improvements.

(4) Project life - 20 years after start of operation of the fishing port (1981).

(5) Prices - Prices in 1978.

(6) Discout rate - 15%.

(7) Evaluation - Net present value, cost benefit ratio and internal rate of returns will be estimated.

8-3-2 Costs

(1) Construction cost

In the construction cost, consultant fee is included. Details of the construction cost by year and by foreign and domestic currencies are shown in Table 6-12. The consultant fee is divided into that for construction and that for management and is allocated to the respective years. For the contingency, 15% of the total construction cost is used. From the character of the cost benefit analysis, the interest during the construction period is not included.

Table 6-12 Details of the construction cost of Sual Fishing Port.

US$1,000
(₱1,000)

Year	Foreign currency			Local currency			Total		
	Construction works	Consultants fee	Total	Construction works	Consultants fee	Total	Construction works	Consultants fee	Total
1979	1,528	406	1,934 (13,960)	1,578	46	1,624 (11,726)	3,106	452	3,558 (25,686)
1980	1,084	260	1,344 (9,700)	2,136	48	2,184 (15,769)	3,220	308	3,528 (25,469)
Total	2,612	666	3,278 (23,660)	3,714	94	3,808 (27,495)	6,326	760	7,086 (51,155)

(2) Operating and maintenance costs

As the annual maintenance expense, 1.5% of the construction cost is counted for the years subsequent to the start of operation. For the personnel expense, a monthly wage of ₱15,800 is estimated for 14 officials

(including a 10% allowance).

(3) Replacement costs

The basic facilities are of longer lifespan than 20 years, and for the functional facilities only, the replacement cost during the project life is counted with lifespan taken as 15 years (the salvage value of project cost, of course, taken into account).

8-3-3 Benefits

(1) Direct benefits

1) Increase in the output of fish catches

With development and improvement of the fishing port, mooring is eased and landing and operational capacities are elevated greatly, while constant supply of the materials such as water, ice and fuel which are required for fishing is enabled, resulting in enlargement of the economic as well as physical capacity of the fishing port (which is presently a mere landing place as it is under the natural condition) for the fishing boats. With such enlarging the capacity, the following changes are occurred (when compared with the case of "without the project").

① Reopening of the operation of the fishing boats which have stopped the operation.

② Increase in the expedition times of the boat which is operated at present.

③ Entry of the registered fishing boats in this port which were unloading at the other ports.

④ Entry of the fishing boats registered in the other ports.

⑤ Increase of the incoming fishing boats owing to construction of new fishing boats.

For the foregoing changes, the economic evaluation is made as set forth in the following.

Judging from the nature of fishing port, it is not surmised that the time reduction in berthing, landing and sailing out fishing will greatly

change the number of expedition times, viz. the number of port calling time. Therefore, item ② is excluded from the analysis. Of the increase of calling boats, items ③ and ④ do not cause large change in light of national economy, and are excluded from the analysis.. Therefore, items ① and ⑤ are covered by the analysis. As for item ⑤, the net benefit can be obtained by subtracting the building cost, operation and maintenance cost, etc. of new boats from gross income, the total sales amount of fish landing. The conditions for calculation and the calculation result are described later.

2) Improvement in the degree of freshness of fish catches

Upon construction of the fishing port, the freshness of the catches is improved greatly due to increase in the supply of ice on one hand and to improvements in the handling and carrying techniques. Consequently, the mean price of the fishes unloaded at the port will rise, and generating much benefit adding the increase in the fish production (Assumptions and procedures of estimation are described later).

3) Method of estimation

Estimation of the net benefits from 1) and 2) above will be made according to the procedure illustrated in the flow chart of Fig. 6-16.

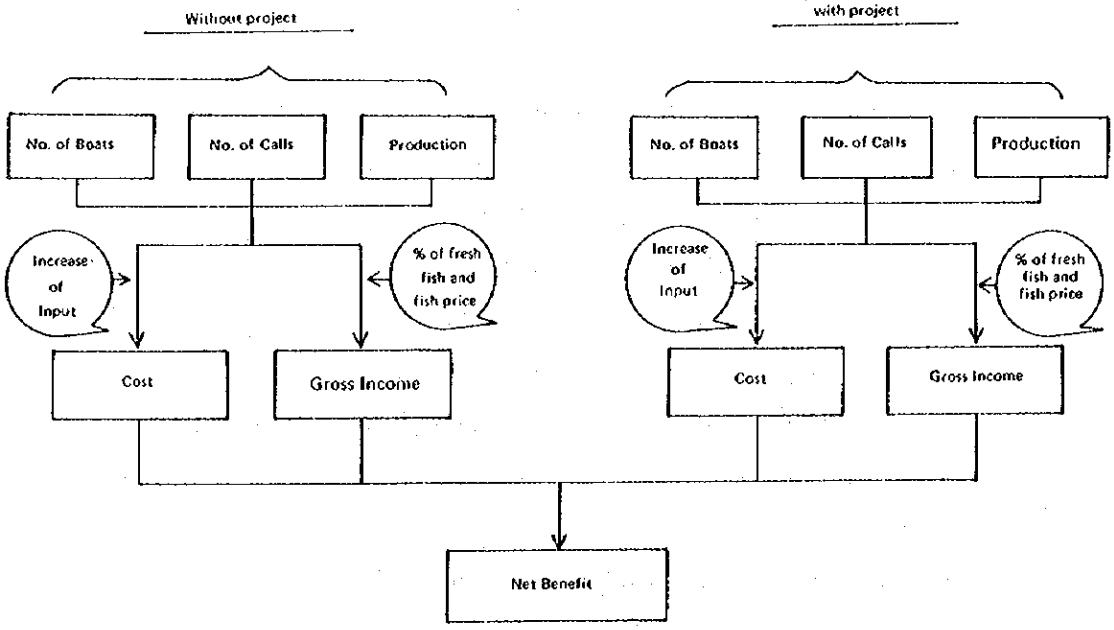


Fig. 6-16 Estimation procedure of net benefit

Estimation of the net benefit is made according to the formula

$$\text{Net benefit } B = GI - C$$

$$GI = B_1 + B_2$$

$$C = C_1 + C_2 + C_3 + C_4$$

where GI : Increment in Gross Income,

B_1 : Increment in Gross Income due to increase in the annual output of catches,

B_2 : Increase in Gross Income due to improvement in the degree of freshness of the fish catches,

C : Increment in the cost,

C_1 : Increment in the depreciation cost of the fishing boat,

C_2 : Increment in the maintenance cost of fishing boat,

C_3 : Increment in the running cost of fishing boat, and

C_4 : Increment in the cost of ice.

Formulas for estimation of B_1 and B_2 constituting items of the gross income are:

① B_1 is increment in gross income due to increase in the output of fish catches

$$B_1 = (Q^1 - Q^0)\left\{ r^0 \cdot P_f + (1 - r^0) Ps \right\}$$

and

② B_2 is increment in gross income due to improvement in the degree of freshness of the fish catches

$$B_2 = Q^1 \cdot (r^1 - r^0)(P_f - P_s)$$

where Q^1 : Output when there is a fishing port,

Q^0 : Output when there is no fishing port,

r^1 : Degree of freshness when there is a fishing port,

r^0 : Degree of freshness when there is no fishing port,

P_f : Price of fresh fish, and

P_s : Price of spoiled fish.

Basic conditions for estimation are as given below.

① Number of fishing boats, fishing boat calls and output of fish catches.

Table 6-13 and Fig. 6-17 show the values with all of the fishing boats coming into this port taken as objectives, and these values are subjected to the following procedure for estimation of the net effect of the fishing port project to the national economy. That is, assuming that there is no increase in the number of days per expedition of fishing operation and that the fishing boats using the port are all of the registered boats in this port, there is obtained, by subtracting the fishing boats using the other ports from the foregoing forecasted value, the increment in the incoming fishing boats due to the fishing boats suspended reopening the operation and the fishing boats newly built. This value is taken as a basis of calculation in this analysis.

Table 6-13 Number of fishing boats, boat calls and output.

Project	Type of boats	1981			1990			2000		
		No. of boats	Calls	Production(t)	No. of boats	Calls	Production(t)	No. of boats	Calls	Production(t)
With project	Trawlers	0	0	0	28	1,792	7,000	60	3,840	15,100
	Bankas	1,075	326,666	4,900	1,400	425,600	6,200	2,200	668,800	9,900
	Total	1,075	326,666	4,900	1,428	427,392	13,200	2,260	672,640	25,500
Without project	Trawlers	0	0	0	0	0	0	0	0	0
	Bankas	1,075	326,666	4,900	1,096	333,333	5,000	1,096	333,333	5,000
	Total	1,075	326,666	4,900	1,096	333,333	5,000	1,096	333,333	5,000

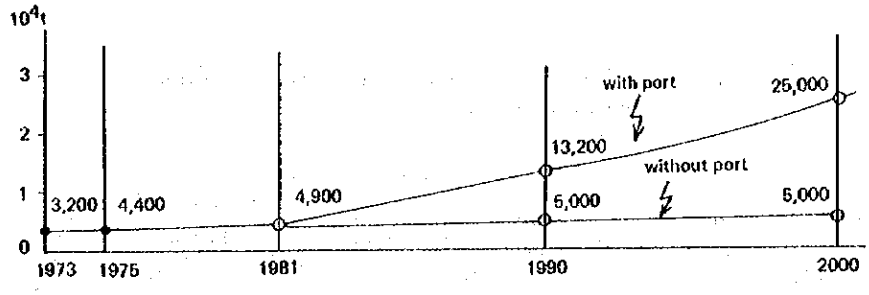


Fig. 6-17 Forecasted fish production with and without fishing port

② Fish prices

As the prices of 1978, a fresh fish price of 6₱/kg and a spoiled fish price of 1.5₱/kg are employed.

Table 6-14 Fish prices (based on local hearing)

₱/kg

Class	1976	1978	
		Peak	Off peak
1st Class	6	7	10--12
2nd Class	4.55	6.5	8.00
3rd Class	3.50	4.0	6.00

③ Degree of freshness

The present ice making capacity of Pangasinan Province as a whole is 900 tons per day, and for 300 working days per year, it is 270,000 tons/year. If 10% is used for keeping the freshness of fishes, 27,000 tons/year of ice is used at present. The present volume of catches by small bankers is 4,400 tons, and the ice supply is not surmised to be insufficient. But since fishes are landed here and there by small boats, the ice supply system is not efficient, and considerable volume of fishes are surmised to be low in freshness. Here is assumed that the spoiled fish rate is 30% in the case the fishing port is not developed and 15% after the fishing port is constructed.

④ Fishing boat construction cost and annual maintenance cost

The fishing boat construction cost and the annual maintenance cost are indicated in Table 6-15.

Table 6-15 Fishing boat construction cost and annual maintenance cost.

₱

Type of boat	Gross Ton (t)	Construction cost	Annual maintenance cost		
			Repair	Fishing nets, ets.	Total
Trawlers	24.6	82,000	4,100	66,667	70,767
Bankas	2.5	8,333	417	0	417

Note 1 : The fishing boat construction cost is assumed to be ₱ 3,333 per gross ton.
(Calculated as 1 ₱ = 30Y)

2 : The repair expense is assumed to be 5% of the construction cost.

3 : Fishing nets, etc.

Purse seiners	₱ 66,667/year
Trawler	₱ 66,667/year
Bagnetters	₱ 13,333/year
Small boats	Negligible

4 : The fishing boats are assumed to be usable for 8 years.

⑤ Fishing boat running cost

This comprises the wage and salaries, fuel cost, water service fee, crew meal expense, etc., and the basic figures for estimation are as shown below.

Table 6-16 Fishing boat running cost per expedition.

₱

Type of boat	Days per expedition (day)	No. of Crews	Average expedition times per year	Crew meal per expedition	Wages per expedition	Water consumption		Operating hours per day (h/day)	Horse power (H.P.)	Fuel consumption	
						ℓ	₱			ℓ	₱
Trawlers	5	11	64	165	825	1,650	2	24	150	3,420	6,840
Bankas	1	6	304	18	0	0	0	10	10	19	38

Note 1) : Fuel - 0.19 ℓ /hp. hour.

2) : Fuel unit price - 2₱/ℓ .

3) : Water - (1) Trawler, 30 ℓ /day.
(2) Purse seiner 30 ℓ /day.
(3) Bagnetter 20 ℓ /day.

4) : Water unit price - domestic water, 0.5 ₱/m^3; and industrial and commercial water, 1.0 ₱/m^3.
Here, the latter is employed (0.001 ₱/ℓ).

5) : Wage and salaries - 15₱/man day (average of the unskilled and the skilled labourer).

6) : Meal expense - 3₱/man day.

⑥ Ice cost

Use of ice by the trawlers, bagnetters is 1.5 ton per ton of fishes.

For the unit price, the market price of 120₱/t is used.

4) Estimation

① Net benefit due to increase in the output of fish catches ₱ 42,195,000

② Net benefit due to improvement in the freshness of fish catches ₱ 32,177,000

③ Total net benefit ₱ 74,372,000

(2) Other benefits

The other benefits which the fishing port improvement brings about are listed in the following.

1) Improvement in self-sufficiency of fishery products.
2) Modernization of fisheries upon accumulation of various functions.
3) Encouraging investments.
4) Stabilization of fish prices.
5) Creation of employment opportunities.
6) Acquisition of new techniques.
7) Increase of fishermen's income.
8) Formation of a new local centre for the regional development.
9) Formation of a fishing village and promotion of organization of fishermen.
10) Outgrowth from dependence on inland waters fishery into dependence on sea fishery.

8-3-4 Evaluation

The result of economic evaluation on construction of the Sual fishing port is as follows.

With the net present value at ₱ 29,729,000 (¥891,870,000 upon exchange rate at 1 ₱ = 30¥), cost benefit ratio at 1.63 and internal rate of returns at 21.4%, the project is considered to be appropriate from the national economic point of view.

Chapter 9 Financial Analysis

9.1 Financial Analysis

Construction of the Sual fishing port is carried out as one of the fishing port construction programs of the Government of the Republic of the Philippines for promotion of the fisheries industry and is, therefore, a highly public project requiring infrastructural investments.

Management of the fishing port will be made by PFMA under the Government of the Republic of the Philippines. Here with the fishing port considered as an independent economic unit, it will be examined what conditions will have to be satisfied mainly for insuring soundness in the management, and upon the result of the examination, necessary proposals will be made.

9-2 Main Factors of Financial Analysis

9-2-1 Usage of the fishing port

The number of fishing boats using the port, frequency of entry and fish landing amount, which constitute the basic data for financial analysis, are set forth in Table 6-17.

Table 6-17 Annual number of fishing boats using Sual port, frequency of entry and fish landing amount.

Item	Year	Trawler	Banka	Total
No. of Boats	1981	0	1,075	1,075
	1990	28	1,400	1,428
	2000	60	2,200	2,260
No. of Calls	1981	0	326,666	326,666
	1990	1,792	425,600	427,392
	2000	3,840	668,800	672,640
Fish Production (tons)	1981	0	4,900	4,900
	1990	7,000	6,200	13,200
	2000	15,100	9,900	25,000

9-2-2 Method of estimation of the revenue of fishing port

(1) Sources of revenue

Here, the revenue of the fishing port is limited to the fees for use of the facilities related to handling of fish catches and supply of material to the fishing boats and the profit from sales of ice when the ice plant and cold storage facilities are operated directly by PFMA.

(2) Method of estimation of the revenue

Basic data for estimation of the revenue and the items of revenue are represented in Fig. 6-18. The method of estimation of the revenue is illustrated in Fig. 6-19.

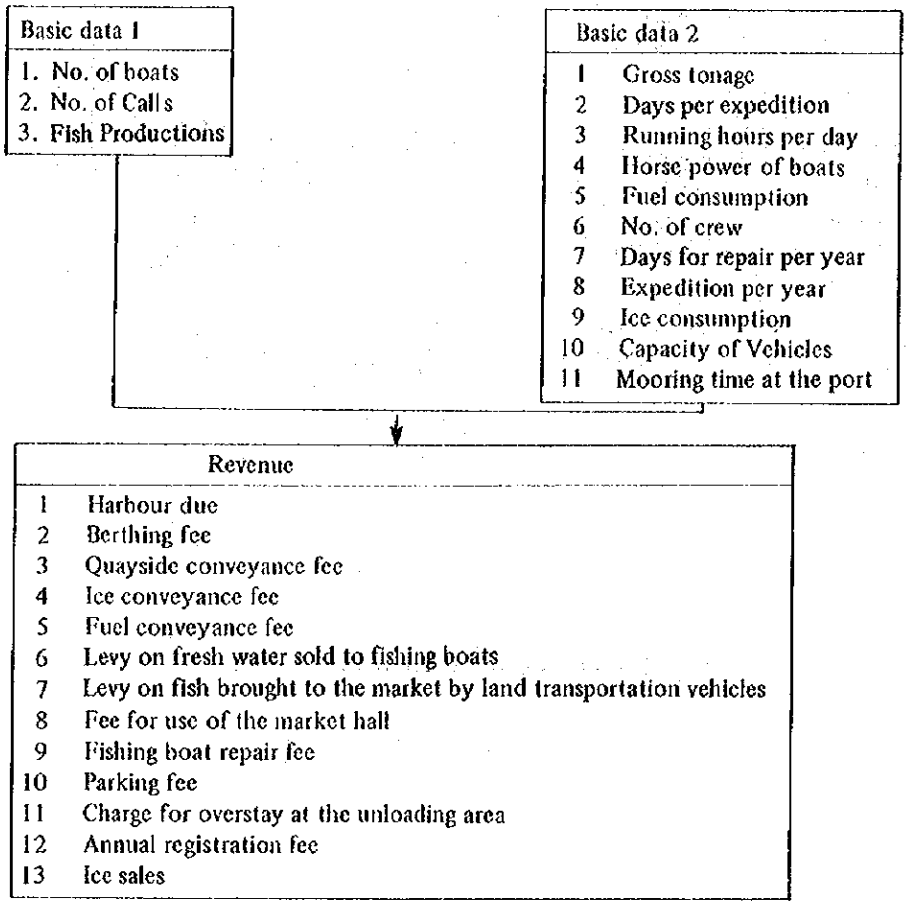


Fig. 6-18 Basic data for estimation of the revenue and items of estimation.

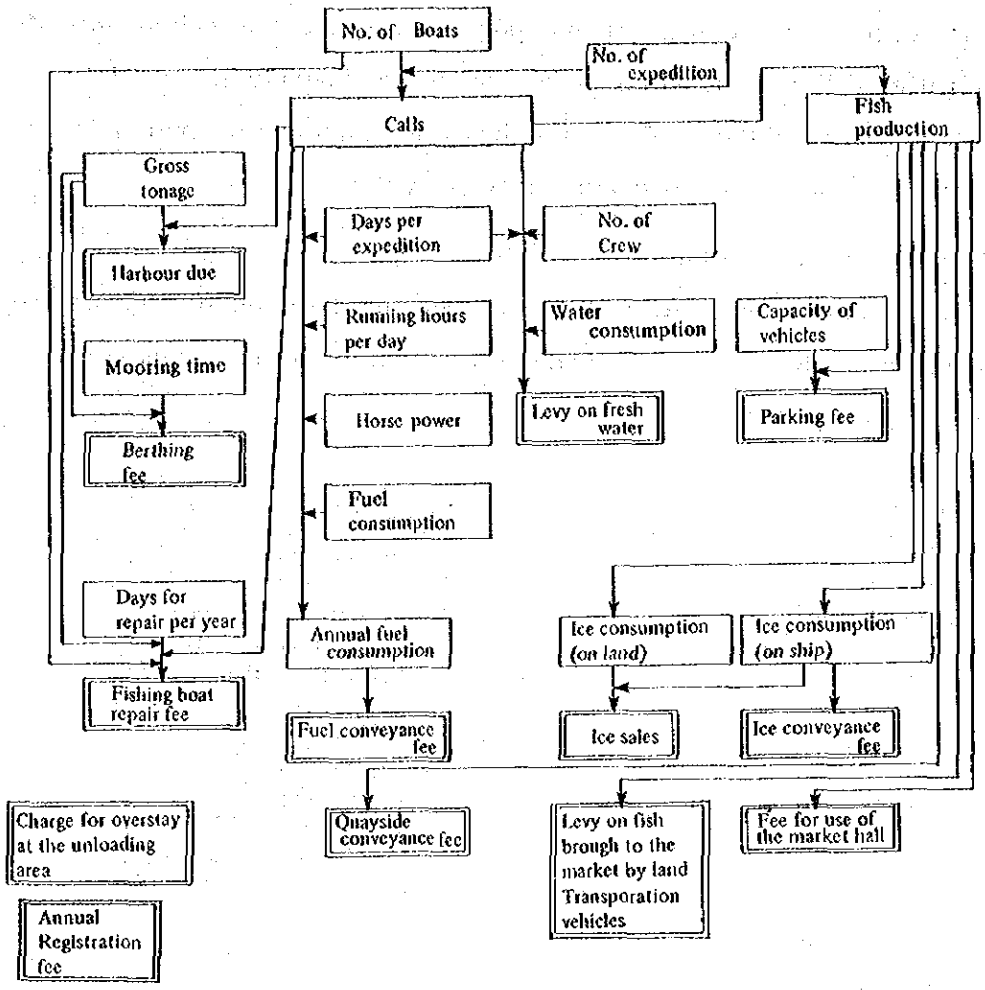


Fig. 6-19 Method of estimation of the revenue

9-2-4 Method of cost estimation

The items of cost are wage and salaries, maintenance expense, depreciation and interests on loans.

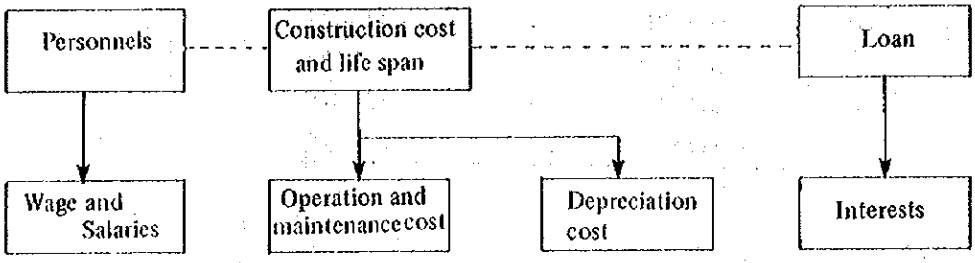


Fig. 6-20 Method of cost estimation

9-3 Revenue of Fishing Port

9-3-1 Harbour due

This is a fee collected from the fishing boats entering the port according to the gross tonnage of the respective boats, and the unit of the fee is 0.6 (₱/gross tonnage per entry).

The calculation formula is

0.6 ×(Gross tonnage)×(Number of entries).

The gross tonnage of the respective types of fishing boats is as shown in Table 6-18.

Table 6-18 Gross tonnage of using fishing boats.

Type of Boats / Item	Trawler	Banka
Gross tonage(tons/boat)	24.6	2.5

The revenue is as shown in Table 6-19.

Table 6-19 Revenue from harbour due

Year	Harbour due	Boat calls
1981	489,999 ₱	326,666 calls
1985	567,771	371,433
1990	664,850	427,392
1995	862,364	550,016
2000	1,059,878	672,640

9-3-2 Berthing fee

This is a fee for use of the berth to be collected from the fishing boats utilizing the fishing port according to the gross tonnage, and the units of the fee are as shown in Table 6-20.

Table 6-20 Unit of berthing fee

Gross tonage	$GT < 10$	$10 \leqq GT < 100$	$100 \leqq GT < 200$	$200 \leqq GT$
Unit fee (₱/entry)	10	12	14	16

The calculation formula is

(Unit fee)×(Number of entries).

The revenue is scheduled in Table 6-21.

Table 6-21 Revenue from berthing fees.

Year	fee	Boat calls
1981	0 (₱)	0 tons
1985	11,952	996
1990	21,504	1,792
2000	46,080	3,840

9-3-3 Quayside conveyance fee

Where the fishes are conveyed on the quay, this is a fee for use of the facility, and the unit of the fee is 1.25₱ per tub.

The tub has a capacity of 40 kg so that the calculation formula is

$$1.25 \times \left(\frac{1000}{40}\right) \times (\text{Landing amount}).$$

The revenue is then presented in Table 6-22.

Table 6-22 Revenue from quayside conveyance fees.

Year	Fee	Fish production
1981	153,125 ₱	4,900 tons
1985	268,403	8,589
1990	412,500	13,200
1995	596,875	19,100
2000	781,250	25,000

9-3-4 Ice conveyance fee

This is a fee for conveyance of ice supplied to the fishing boats. The ice is supplied to the trawlers, and its quantity is the same to that of the fish catches landed. The unit of the conveyance fee is 0.09398 (₱/block). The calculation formula is

$$0.09398 \times \left(\frac{1000}{50}\right) \times (\text{Quantity of fish landed (for trawlers)})$$

provided 1 block = 50 kg.

The revenue is as shown in Table 6-23.

Table 6-23 Revenue from ice conveyance fees.

Year	Fee	Fish production (Trawler)
1981	0 ₱	0 tons
1985	5,848	3,111
1990	13,158	7,000
1995	20,771	11,050
2000	28,383	15,100

9-3-5 Fuel conveyance fee

This is the fee for conveyance of the fuel supplied to the fishing boats and

is a fee for use of the fuel supply facility. The annual amount of consumption of the fuel is given by

(Number of entries)×(Days of expedition)×(Running hours a day)
×(Horse power)× Main fuel consumption),

and the unit fee is 4 (₱/kl). The calculation formula is

$$4 \times \left(\frac{1}{1000}\right) \times (\text{Annual fuel consumption}).$$

The original units required for calculation are of the values shown in Table 6-24.

Table 6-24 Original units concerning fuel consumption.

Item \ Type of boats	Trawler	Banka
Days per expedition (Day)	5	1
Running hours per day (hr)	24	10
Horse Power (H.P)	24.6	2.5
Fuel consumption (ℓ/H.P.hr)	0.19	0.19

The revenue is as shown in Table 6-25.

Table 6-25 Revenue from fuel conveyance fees.

Year	Fee	Annual fuel consumption	Boat calls
1981	24,827 ₱	6,207 Kℓ	326,666 calls
1985	39,064	9,766	371,433
1990	56,860	14,215	427,392
1995	80,110	20,028	550,016
2000	103,360	25,840	672,640

9-3-6 Levy on fresh water sold to fishing boats

This is collected for the water supply to the fishing boats and is a fee for use of the facility.

The annual amount of consumption of water is given by

(Number of entries)×(Original unit of water consumption)

×(Number of crew)×(Days of expedition)

and the unit of the fee is 0.5 (₱/ton). Then, the calculation formula is

$$0.5 \times\left(\frac{1}{1000}\right)\times(\text{Annual water consumption}).$$

The original units required for calculation are of the values shown in Table 6-26.

Table 6-26 Original units concerning water consumption.

Item \ Type of Boats	Trawler	Banka
Water consumption (ℓ/person day)	30	0
No. of Crew	11	6
Days per expedition (days)	5	1

Table 6-27 Revenue from levies on fresh water sold to fishing boats.

Year	Levies	Annual water consumption	Boat calls
1981	0 ₱	0 tons	326,666 calls
1985	657	1,314	371,433
1990	1,478	2,957	427,392
1995	2,323	4,646	550,016
2000	3,168	6,336	672,640

9-3-7 Levy on fish brought to the market by land transportation vehicles

This is a fee for transportation of fishes from fishing boats to the market, and the unit of the fee is 0.50 (₱/tub). The calculation formula is

$$0.50 \times \left(\frac{1000}{40}\right) \times (\text{Landed amount of fish catches}).$$

The revenue is as shown in Table 6-28.

Table 6-28 Revenue from levies on fishes brought to the market by land transportation vehicles.

Year	Levies	Fish production
1981	61,250 ₱	4,900 tons
1985	107,361	8,589
1990	165,000	13,200
1995	238,750	19,100
2000	312,500	25,000

9-3-8 Fee for use of the market hall

This is a fee for use of the market hall, and the unit of the fee is 0.15 (₱/tub). The calculation formula is

$$0.15 \times \left(\frac{1000}{40}\right) \times (\text{Landed amount of fish catches}).$$

The revenue is as shown in Table 6-29.

Table 6-29 Revenue from fee for use of the market hall.

Year	Fee	Fish production
1981	18,375 ₱	4,900 tons
1985	32,208	8,589
1990	49,500	13,200
1995	71,625	19,100
2000	93,750	25,000

9-3-9 Fishing boat repair fee

Upon repair of a fishing boat, this is a fee for use of the facility to be collected according to the gross tonnage and the number of days of repair. The units of the fee are as shown in Table 6-30.

Table 6-30 Units of the fishing boat repair fee

Gross tonage (GT)	GT < 10	10 ≤ GT < 100	100 ≤ GT < 200	200 ≤ GT
Unit fee (P/day)	10	15	20	30

Accordingly, the calculation formula is

(Unit fee)×(Number of days of repair)×(Number of fishing boats).

The original units required for calculation are of the values shown in Table 6-31, and the revenue is as shown in Table 6-32.

Table 6-31 Original units related to use of the repair facility.

Item \ Type of boats	Trawler	Banka
Gross tonage (tons/boat)	24.6	2.5
Days for repair per year (day)	10	2

Table 6-32 Revenue from fishing boat repair fees.

Year	Fee	No. of Boats
1981	21,500 ₱	1,075
1985	26,256	1,232
1990	32,200	1,428
1995	42,600	1,844
2000	53,000	2,260

9-3-10 Parking fee

This is a fee for the fish carrier trucks in use of the parking facility. The carrier trucks are of a fish loading capacity of 18 tubs/truck (720 kg/ truck), and the parking fee is 5₱ a day or less.

The calculation formula is

$$5 \times \left(\frac{1000}{720}\right) \times (\text{Landed amount of catches})$$

Then, the revenue is as shown in Table 6-33.

Table 6-33 Revenue from parking fees.

Year	Fee	Fish production
1981	34,028 ₱	4,900 tons
1985	59,645	8,589
1990	91,667	13,200
1995	132,639	19,100
2000	173,611	25,000

9-3-11 Charge for overstay at the unloading area

This is a charge for staying over the standard time at the unloading area, but it is difficult to estimate such charge so that it is not counted here.

9-3-12 Annual registration fees

This represent the fees for registration of the brokers, wholesalers and shipowners but is not included here.

9-3-13 Ice sales

This represents the profit from sales of ice for maintaining the freshness of fishes. The wholesale price of ice is taken as 120 ₱/t, and its 20% or 24 ₱/t is assumed to be the profit. The original units of the ice consumption are shown in Table 6-34. The calculation formula is

$$24 \times 1000 \times (1 \times \text{Landed amount of catches (trawlers)} + 1/2 \times \text{Total amount of landed catches}).$$

The revenue is given as shown in Table 6-35.

Table 6-34 Ice consumption original units.

kg/fish kg

Item \ Type of boats	Trawler	Banka
Ice consumption (on ship)	1	0
Ice consumption (on land)	0.5	0.5

Table 6-35 Ice sales.

Year	Net Income	Ice consumption (on ship)	Ice consumption (on land)
1981	58,800 ₱	0 tons	2,450 tons
1985	177,733	3,111	4,294
1990	326,400	7,000	6,600
1995	494,400	11,050	9,550
2000	662,400	15,100	12,500

9-4 Expenditures of Fishing Port

9-4-1 Personnel expense

The officials of the organization of administration of the fishing port are estimated at 14 persons. The monthly personnel expense is assumed to be ₱15,800. Then, with an allowance of 10% added, the annual personnel expense is estimated at ₱208,560.

9-4-2 Maintenance expense

As the annual maintenance expense of the fishing port facilities, 1.5% of the construction cost is taken, and an amount of ₱685,087/year is estimated.

9-4-3 Depreciation

The basic facilities are of longer lifespan so that they are excluded from the objects of depreciation, with the maintenance expense counted for them.

The functional facilities have the 15 years lifespan, with the salvage value set to 0. With the straight line method, the annual amount of depreciation is ₱419,825.

9-4-4 Interest on loan

The loan as the management entity is ₱23,660,000. The interest was then calculated at a rate of 3.5 percent. The principal repayment is done equally every year in 15 years after 1987 so that the interest payable after 1987 will decrease gradually.

9-5 Financial Evaluation

Income statement of the Lucena fishing port and the cash flow are set forth in Tables 6-36 and 6-37.

As the result of the foregoing financial analysis, it was found that it would be difficult financially for PFMA, to perform the operation of the fishing port as the independent entity. That is, repayment of the interest of the fishing port construction cost requiring an enormous amount of investment are hardly practicable, making it impossible to be grounded as an enterprise.

Accordingly, for the management of the fishing port to be operated soundly, all or considerable part of the fishing port construction should be carried out directly by the Government of the Republic of the Philippines so that the financial burden on PFMA, management entity of the fishing port after completion, would be reduced.

However, as seen from the result of the economic evaluation in Chapter 8, the development and improvement of the fishing port will bring about many economic effects and are thus worthy of investment.

Table 6-36 Income statement of Sual fishing port

(P)

Item	Year	1979	1980	1981	1982	1983	1984	1985	1986
1. Revenues	Harbour Due	--	--	489,999	509,427	528,855	548,283	567,711	587,138
	Berthing Fee	--	--	0	2,338	4,776	7,164	9,552	11,952
	Quayside Conveyance Fee	--	--	153,125	181,944	210,764	239,583	268,403	297,222
	Ice Conveyance Fee	--	--	0	1,462	2,924	4,386	5,848	7,310
	Fuel Conveyance Fee	--	--	24,827	28,386	31,945	35,504	39,064	42,623
	Levy on Fresh Water sold to Fishing Boats	--	--	0	164	329	493	657	821
	Levy on Fish brought to the Market	--	--	61,250	72,778	84,306	95,833	107,361	118,889
	Fee for Use of the Market Hall	--	--	18,375	21,833	25,292	28,750	32,208	35,667
	Fishing Boat Repair Fee	--	--	21,500	22,689	23,878	25,067	26,256	27,444
	Parking Fee	--	--	34,028	40,432	46,836	53,241	59,645	66,049
	Ice Sales	--	--	58,800	88,533	118,267	148,000	177,733	207,467
	Total	--	--	861,303	970,037	1,078,170	1,186,304	1,294,438	1,402,583
2. Expenses	Salaries and Wages			208,560					
	Repair and Maintenance	--	--	685,087	2,313,472	〃	〃	〃	〃
	Depreciation	--	--	1,419,825					
	Interest	244,304	658,360	828,112	828,112	828,112	828,112	828,112	828,112
	Total	244,304	658,360	3,141,584	3,141,584	3,141,584	3,141,584	3,141,584	3,141,584
3. Income before Depreciation and Interest		0	0	△ 31,744	76,390	184,523	292,657	400,791	508,936
4. Net Income		△ 244,304	△ 658,360	△ 2,279,681	△ 2,171,547	△ 2,063,414	△ 1,955,280	△ 1,847,146	△ 1,739,001
5. Accumulated Income		△ 244,304	△ 902,664	△ 3,182,345	△ 5353892	△ 7417,306	△ 9372,586	△11219,732	△12958733

Item	Year	1987	1988	1989	1990	1991	1992	1993	1994
1. Revenues	Harbour Due	606,566	625,994	645,422	664,850	704,353	743,856	783,358	822,861
	Berthing Fee	14,340	16,728	19,116	21,504	23,964	26,424	28,872	31,332
	Quayside Conveyance Fee	326,042	354,861	383,681	412,500	449,375	486,250	523,125	560,000
	Ice Conveyance Fee	8,772	10,234	11,696	13,158	14,680	16,203	17,726	19,248
	Fuel Conveyance Fee	46,182	49,742	53,301	56,860	61,510	66,160	70,810	75,460
	Levy on Fresh Water sold to Fishing Boats	986	1,150	1,314	1,478	1,647	1,816	1,985	2,154
	Levy on Fish brought to the Market	130,417	141,944	153,472	165,000	179,750	194,500	209,250	224,000
	Fee for Use of the Market Hall	39,125	42,583	46,042	49,500	53,925	58,350	62,775	67,200
	Fishing Boat Repair Fee	28,633	29,822	31,011	32,200	34,280	36,360	38,440	40,520
	Parking Fee	72,454	78,858	85,262	91,667	99,861	108,056	116,250	124,444
	Ice Sales	237,200	266,933	296,667	326,400	360,000	393,600	427,200	460,800
	Total	1,510,716	1,618,850	1,726,984	1,835,117	1,983,345	2,131,575	2,279,791	2,428,021
2. Expenses	Salaries and Wages	208,560							
	Repair and Maintenance	685,087	2,313,472	〃	〃	〃	〃	〃	〃
	Depreciation	1,419,825							
	Interest	772,903	717,694	662,485	607,276	552,067	496,858	441,649	386,440
	Total	3,086,375	3,031,166	2,975,957	2,920,748	2,865,539	2,810,330	2,755,121	2,699,912
3. Income before Depreciation and Interest		617,069	725,203	833,337	941,470	1,089,698	1,237,928	1,386,144	1,534,374
4. Net Income		△ 1,575,659	△ 1,412,316	△ 1,248,973	△ 1,085,631	△ 882,194	△ 678,755	△ 475,330	△ 271,891
5. Accumulated Income		△14,534,392	△15,946,708	△17,195,681	△18,281,312	△19,163,506	△19,842,261	△20,317,591	△20,589,482

Item	Year	1995	1996	1997	1998	1999	2000		
1. Revenues	Harbour Due	862,364	901,867	941,370	980,873	1,020,376	1,059,878		
	Berthing Fee	33,792	36,252	38,712	41,160	43,620	46,080		
	Quayside Conveyance Fee	596,875	633,750	670,625	707,500	744,375	781,250		
	Ice Conveyance Fee	20,771	22,293	23,816	25,338	26,861	28,383		
	Fuel Conveyance Fee	80,110	84,760	89,410	94,060	98,710	103,360		
	Levy on Fresh Water sold to Fishing Boats	2,323	2,492	2,661	2,830	2,999	3,168		
	Levy on Fish brought to the Market	238,750	253,500	268,250	283,000	297,750	312,500		
	Fee for Use of the Market Hall	71,625	76,050	80,475	84,900	89,325	93,750		
	Fishing Boat Repair Fee	42,600	44,680	46,760	43,840	50,920	53,000		
	Parking Fee	132,639	140,833	149,028	157,222	165,417	173,611		
	Ice Sales	494,400	528,000	561,600	595,200	628,800	662,400		
	Total	2,576,249	2,724,477	2,872,707	3,020,923	3,169,153	3,317,381		
2. Expenses	Salaries and Wages	208,560							
	Repair and Maintenance	685,087	2,313,472	〃	〃	〃	〃		
	Depreciation	1,419,825							
	Interest	331,231	276,022	220,813	165,604	110,395	55,186		
	Total	2,644,703	2,589,494	2,534,285	2,479,076	2,423,867	2,368,658		
3. Income before Depreciation and Interest		1,682,602	1,830,830	1,979,060	2,127,276	2,275,506	2,423,734		
4. Net Income		△ 68,454	134,983	338,422	541,847	745,286	948,723		
5. Accumulated Income		△20,657,936	△20,522,953	△20,184,531	△19,642,684	△18,897,398	△17,948,675		

Table 6-37 Cash-flow schedule of Sual fishing port

(₱)

	Item \ Year	1979	1980	1981	1982	1983	1984	1985	1986
1. Source of Funds	Equity	11,725,670	15,768,877	—	—	—	—	—	—
	Loan	13,960,217	9,700,135	—	—	—	—	—	—
	Gov. Project Allotment	244,304	658,360	859,856	751,722	643,589	535,455	427,321	1,896,576
	Depreciation	—	—	1,419,825	1,419,825	1,419,825	1,419,825	1,419,825	1,419,825
	Net income	△ 244,304	△ 658,360	△ 2,279,681	△ 2,171,547	△ 2,063,414	△ 1,955,280	△ 1,847,146	△ 1,739,001
	Total	25,685,887	25,469,012	0	0	0	0	0	1,577,400
2. Uses of Funds	Construction	25,685,887	25,469,012	—	—	—	—	—	—
	Loan Amortization	—	—	—	—	—	—	—	1,577,400
	Reinvestment	—	—	—	—	—	—	—	—
	Total	25,685,887	25,469,012	0	0	0	0	0	1,577,400

	Item \ Year	1987	1988	1989	1990	1991	1992	1993	1994
1. Source of Funds	Equity	—	—	—	—	—	—	—	—
	Loan	—	—	—	—	—	—	—	—
	Gov. Project Allotment	1,733,234	1,569,901	1,406,548	1,243,206	1,039,769	836,330	632,905	429,466
	Depreciation	1,419,825	1,419,825	1,419,825	1,419,825	1,419,825	1,419,825	1,419,825	1,419,825
	Net income	△ 1,575,659	△ 1,412,316	△ 1,248,973	△ 1,085,631	△ 882,194	△ 678,755	△ 475,330	△ 271,891
	Total	1,577,400	1,577,400	1,577,400	1,577,400	1,577,400	1,577,400	1,577,400	1,577,400
2. Uses of Funds	Construction	—	—	—	—	—	—	—	—
	Loan Amortization	1,577,400	1,577,400	1,577,400	1,577,400	1,577,400	1,577,400	1,577,400	1,577,400
	Reinvestment	—	—	—	—	—	—	—	—
	Total	1,577,400	1,577,400	1,577,400	1,577,400	1,577,400	1,577,400	1,577,400	1,577,400

	Item \ Year	1995	1996	1997	1998	1999	2000		
1. Source of Funds	Equity	—	—	—	—	—	—		
	Loan	—	—	—	—	—	—		
	Gov. Project Allotment	226,029	21,319,967	△ 180,847	△ 384,272	△ 587,711	△ 791,148		
	Depreciation	1,419,825	1,419,825	1,419,825	1,419,825	1,419,825	1,419,825		
	Net income	△ 68,454	134,983	338,422	541,847	745,286	948,723		
	Total	1,577,400	22,874,775	1,577,400	1,577,400	1,577,400	1,577,400		
2. Uses of Funds	Construction	—	—	—	—	—	—		
	Loan Amortization	1,577,400	1,577,400	1,577,400	1,577,400	1,577,400	1,577,400		
	Reinvestment	—	21,297,375	—	—	—	—		
	Total	1,577,400	22,874,775	1,577,400	1,577,400	1,577,400	1,577,400		

Part Ⅶ
Consultants Service

PART VII CONSULTANTS SERVICE

Chapter 1 Basic Conception and Scope of Service

The concultants selected to promote the development project of Philippines fishing ports perform the following consultants service.

(1) Preliminary survey for making execution design

Preliminary survey for making execution design shall be conducted in the project sites, for the purposes of making a program of detailed surveys to be conducted prior to detailed design and collecting various informations and technical data required for promoting the project.

(2) Detailed surveys

The following surveys shall be conducted in the project sites, to collect data necessary for design and to determine the design conditions of various structures.

1. Topographic surveying ... The entire regions of project sites
2. Sounding ... Necessary ranges in the water areas of sites
3. Soil exploration ... Investigation by boring, including necessary soil test and analysis
4. Construction materials investigation ... Prices of locally procured materials and imported materials, amounts of supply, domestic transportation, etc.
5. Other surveys ... Other necessary surveys

(3) Execution design

Using the technical information, data, etc. obtained in the detailed surveys, detailed design shall be made, to make design drawings, specifications, and contract documents. Being instructed by the Government of the Republic of the Philippines, the final execution quantities shall be decided, and the construction work cost shall be calculated.

(4) Ancillary service to the tender examination

Various informations necessary for inviting tenders shall be presented to the Government of the Republic of the Philippines, and through handing of tender

business, tender contents shall be examined, to assist the Government to select contractors through qualification.

(5) Supervising service

Supervision by way of work execution control, quality control, etc. shall be made on general construction work.

(6) Completion inspection supporting service

Supporting service shall be provided for the completion inspection conducted by the Gevernment of the Republic of the Philippines.

(7) Support to training

Assistance shall be provided for the training of the personnel of the Government of the Republic of the Philippines executed by the Japanese government concerning the planning, construction and administration of fishing ports. The period is about one month.

(8) Support to management guidance

Assistance shall be provided for the guidance concerning the management of fishing ports executed by Japanese government for three years from 1980 to 1983.

Chapter 2 Schedule and Cost of Consultants Service

2-1 Schedule

The schedule of consultants service is as shown in Table 7-1.

The times for executing the following respective items are as follows. The years in the parentheses show the execution times of the respective items, estimated on the assumption that construction starts at the end of 1978.

(1) Sub-soil investigation ... 1st year (from the end of 1978 to the beginning of 1979)

(2) Topographic surveying (including sounding) ... 1st year (from the end of 1978 to the beginning of 1979)

(3) Execution design ... 1st year (1979)

(4) Training ... 2nd year (1980)

(5) Management guidance ... 3rd year and after (3 years after 1980)

2-2 Cost

The cost considered necessary for consultants service is as shown in Table 7-2. This calculation is made on the assumption that construction of the five ports included in Package (I) starts simultaneously.

Table 7-1 Schedule of consultants service

Year & Month	1st Year												2nd Year						
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7
Consultants Service																			
(1) Sub Soil Investigation of Topographical Survey																			
(2) Field Investigation																			
(3) Designing of Cost Estimation																			
(4) Arrangement of Tendering																			
(5) Qualification & Investigation															Being continued to completion →				
(6) Supervision & Inspection																			

Table 7-2 Cost estimation of consultants service

(Unit in x 1,000 US$)

Subject	Sub-Item	Consulting Service Cost		
		Local	Foreign	Amount
Engineering Service (Part-1)		(323)	(4,542)	(4,865)
	Sub Soil Investigation	232	581	813
	Topographical Survey	62	158	220
	Designing & Cost Estimation	29	3,803	3,832
	(1) for Basic Facilities	22	2,299	2,321
	(2) for Functional Facilities	7	1,504	1,511
Engineering Service (Part-2)	Supervision & Inspection	(864)	(5,291)	(6,155)
	(1) for Basic Facilities	604	4,545	5,149
	(2) for Function Facilities	260	746	1,006
Training		(8)	(44)	(52)
	Technical Training	4	22	26
	Operational Training	4	22	26
Guidance		(115)	(631)	(746)
	Guidance	115	631	746
Total		1,310	10,508	11,818

Chapter 3 Construction Work Cost and Consultants Service Cost

The total amount of construction work cost for five ports (Zamboanga, Iloilo, Camaligan, Lucena and Sual ports included in Package (I) is US$108,550,000 including 15% of contingency. The consultants service cost required for it is US$11,818,000 as shown in Table 7-2.

Therefore, the total project cost required for developing five ports included in Package (I) is

Foreign currency:	US$60,762,000
Domestic currency:	US$59,604,000
Total:	US$120,366,000

The breakdown is shown in Table 7-3.

Table 7-3 Summary of project cost estimated for Package-I

(1 US$ = 220 ¥)
(1 US$ = 7.22 ₱)

District	Local Portion (US$)	Foreign Portion (US$)	Total Amount (US$)
1. Zamboanga Port	7,037,484	5,153,671	12,191,155
2. Iloilo Port	17,898,457	16,927,305	34,825,762
3. Camaligan Port	10,009,056	11,271,066	21,280,122
4. Lucena Port	19,634,846	14,290,069	33,924,915
5. Sual Port	3,866,167	2,459,660	6,325,827
Sub-Total	58,446,010	50,101,771	108,547,781
6. Consultant Services	1,310,000	10,508,000	11,818,000
Grand Total	59,756,010	60,609,771	120,365,781

Part VIII
Administration and Operations of Fishing Ports

PART VIII ADMINISTRATION AND OPERATIONS OF FISHING PORTS

Chapter 1 Administration of Fishing Ports

1-1 Basic principles of administration

To sufficiently demonstrate the functions of fishing port facilities, how to administer and operate the facilities is the most important.

There are two basic principles for administration as given below.

(1) To maintain the facilities always in perfect conditions.

(2) To allow the facilities to be always used effectively, for sufficient demonstration of the functions.

Therefore, with regard to the utilization by fishing boats, such functions as safe sailing from and back to the port, smooth landing, and easy and prompt supply to and repair of fishing boats must be secured.

With regard to the landing of catches, smooth collection and distribution of enormous volume of cargoes, fair trading, formation of reasonable prices, etc. must be attained.

1-2 Administrator and administrative organization

Since a fishing port is facilities with highly public nature, the administrator must be an administrative organ with competence.

In the Philippines, fishing ports are to be administered by the Philippine Fish Marketing Authority (PFMA) established in October, 1976 based on Presidential decree No. 977 (proclaimed in August, 1976). The PFMA is under the direction of Director General of the Department of Natural Resources, the Government of the Republic of the Philippines, and has competence and responsibility over the establishment, administration and operations of fishing ports, fish markets, etc.

The top management consists of Director General of the Department of Natural Resources as the chairman, Director General of the Department of Public Works, Transportation and Communications as the vice-chairman, and five other commissioners. Under the management, the general manager is positioned as a responsible person for actual business.

The organization chart of PFMA is as shown in Fig. 8-1.

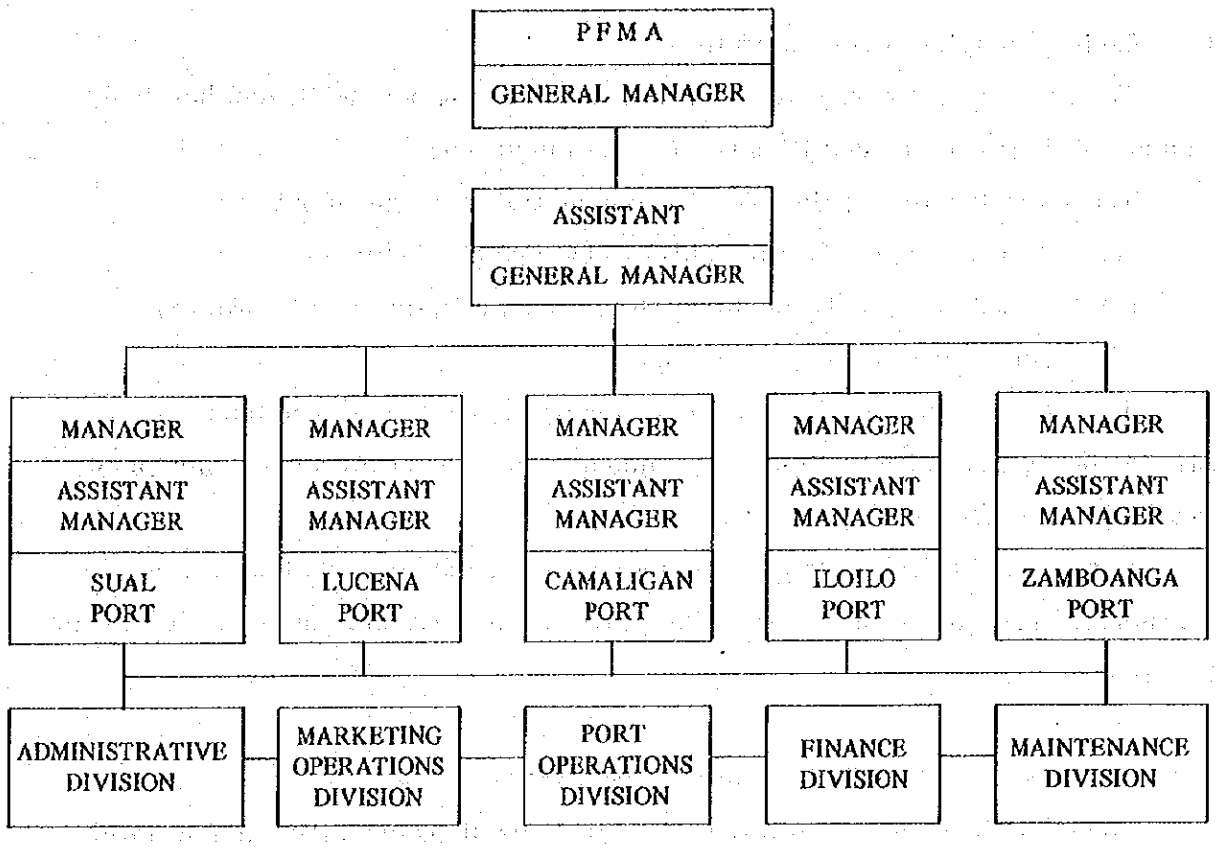


Fig. 8-1 Fishing port administration organization of PFMA

For the administration and operations of five ports to be completed under the fishing port development project, as obvious also from Fig. 8-2, an administrative office shall be established for each fishing port, and under the manager, Administrative Division, Marketing Operations Division, Harbor Operations Division, Maintenance Division and Finance Division are provided.

At present, PFMA administers and operates Navotas fishing port located at a coastal tip in Manila Metropolitan, but partly because it is not long since the organi-

zation was established, the system and method of administration and operations are not quite sufficient. Therefore, the Government of the Republic of the Philippines is now studying to establish the system and method of administration and operations suitable for the actual situations of Philippines fisheries.

The PFMA orders private consultants to study this problem, to obtain data to discuss with, as to how the administration and operations of fishing ports should be. The problem is now being investigated.

The PFMA participates in this fishing port development project, by despatching their personnel to PPDO, the organ in charge of this project.

1-3 Fishermen's organizations

With regard to the present situations, etc. of the fishermen's organizations relating to the administration and operations of fishing ports, see Chapter 4 of Appendix.

Chapter 2 Operations of Fishing Ports

For sufficient demonstration of fishing port functions, proper administration and operations are required. Fishing ports should be operated according to the system and method suitable for the characteristics of Philippines fisheries. Not being restricted too much by the present circumstances, proper operation system and method must be established, considering modernization and rationalization in future, too.

The Government of the Republic of the Philippines executes the operations of fishing ports under the responsibility of PFMA, a competent administrator, but the details of the operations are partially undetermined, being studied still now.

Below are considered the operations of fishing ports.

2-1 Operation methods of fishing port facilities from the viewpoint of a fishing port administrator

There are three operation methods of fishing port facilities from the viewpoint of a fishing port administrator.

(1) Both administration and operations are performed.

(2) Though administration is performed, operations are entrusted to another organization (private enterprise, etc.).

(3) Though the place for facilities is provided, all the construction, administration and operations of the facilities are performed by another organization (private enterprise, etc.).

What method of these to be employed should be determined according to the purposes and characters of the facilities of respective fishing ports. At the time when the fishing ports are completed, it is desirable that main facilities are completely developed, and that operations are performed by method (1) or (2), for sufficient demonstration of the functions.

2-2 Classification of fishing port facilities and operation methods

Fishing port facilities can roughly be classified as follows:

A. Basic facilities:

External protective facilites ... Breakwater, retaining wall, seawall, etc.

Mooring facilities ... Quay, landing facility, piled pier, slipway (large repairs of fishing boats are not made)

Harbor facilites ... Mooring basin, waterway, ancherage.

B. Functional facilities:

Transport facilities ... (1) Road, (2) Parking area, etc.

Navigation aid facilities ... (3) Light beacons, etc.

Land for fishing port facilities ... (4) Land for various fishing port facilities

Supply facilities ... (5) Water supply facilities, (6) Fuel supply facilities.

Fish distributive facilities ... (7) Fish market, (8) Marine products warehouse, (9) Open storage yard, etc.

Fish storage facilities ... (10) Ice plant and cold storage

Fish processing facilities ... (11) Processing shop

Fish boat and gear maintenance facilities ... (12) Fishing boat repairing dock, (13) Net & gear area, etc.

Fishing port administration facilities ... (14) Administration office, (15) Check point, etc.

And so on

The above respective fishing port facilities can be classified under the three operation methods described in 2-1, as follows.

Facilities to be operated under method of (1)

All the basic facilities of A. and

Of functional facilities B, (1), (2), (3), (4), (9), (13), (14) and (15).

Facility to be operated under method of (3) is; ..... (11).

Facilities to be operated under either method of (1) or (2) ..... (5), (6), (7), (8), (10),and (12).

With regard to the operation methods of these facilities, the Government of the Republic of the Philippines considers as follows:

Facilities to be operated under method (1) ..... (5), (7) and (8).

Facilities to be operated under method (2) ..... (6).

Facilities not yet decided ..... (10) and (12).

Part IX

Future Problems to be Studied and Recommendations

PART IX FUTURE PROBLEMS TO BE STUDIED AND RECOMMENDATIONS

1. Intensification of the system of fishing port administration and operations

With regard to the system of administration and operations of PFMA who is in charge of the administration, operations, etc. of fishing ports, it is necessary to intensify the system as soon as possible by securing required employees, etc. for smooth administration and operations of many fishing ports scheduled to be completed, in the rapid execution of the fishing port development project.

Furthermore, for the fishing ports, it is necessary to construct required facilities such as administration offices, and to secure housing for administrative personnel.

2. Training concerning the administration and operations of fishing ports

For smooth administration and operations of fishing ports, many skilled workers are required. It is effective for smooth administration and operations in future that workers make on-site inspections of the fishing ports developed under Package (I) or any foreign countries with fishing ports developed more highly than the former, or are trained in those countries regarding the actual conditions of administration and operations.

3. Nursery of fishing port experts

The development of many fishing ports is absolutely necessary for sound development of Philippine fisheries. For this purpose, experts with wide knowledge concerning the planning and construction of fishing ports are required. The techniques concerning fishing ports are very special, and it is difficult to obtain immediately experts from other fields. Therefore, it is necessary to nurse experts by giving the knowledge of fishing port planning and fisheries to engineers with knowledge of civil engineering, particularly harbor engineering. Since experts cannot be nursed overnight, nursing should be started as soon as possible. Training in overseas advanced countries is of course very effective for nursing experts.

4. Notes for execution design

(1) Soil exploration is not executed in the construction sites of fishing ports. Therefore, it is necessary to execute soil exploration such as boring of soil investigation before making execution design, and to design based on the results. Of the five project fishing ports, particularly the construction site of Camaligan fishing port is estimated to have relatively soft silty soil and clayey soil, and soil exploration should be made carefully. Furthermore, it is feared that reefs partially exist at the construction site of Lucena fishing port, and the existence must be confirmed.

(2) For designing fishing port facilities, it is desirable to sufficiently hear demands relating to use, from the captains, etc. of the fishing boats expected to use the facilities. Particular attention should be paid to the installation positions of such facilities as bollards and bitts and fenders and to the protection of hulls from damage in case bagnetters/basnigs and small boats with fragile hull use mooring facilities.

APPENDIX

APPENDIX

Chapter 1 Governmental Organization in Charge of the Planning and Construction of the Fishing Port Development Project

The fishing port development project is controlled by a committee consisting of the organs concerned of the Government of the Republic of the Philippines, as shown in Fig. A-1-1.

1-1 Organization in charge of the planning stage of the fishing port development project

The fishing port development project is planned by the Planning and Project Development Office (PPDO).

The PPDO has been established in the Department of Public Works, Transportation and Communications, a member of the above committee. The personnel are experts despatched from the respective organs concerned participating in the committee. The feasibility study, etc. conducted so far concerning the fishing port development project were made by PPDO.

1-2 Organization in charge of the construction stage of the fishing port development project

For the construction under the fishing port development project, as shown in Fig. A-1-2, Technical Design and Review Committee, Committee on Bids and Awards, and Construction Committee are instituted under the management of the general manager of the Philippine Fish Marketing Authority (PFMA) and the construction business is promoted under the supervision of the chairman of the respective committees. These operations are made by the project manager.

The staff of these committees are personnel of the organs concerned of the central government and provincial governments.

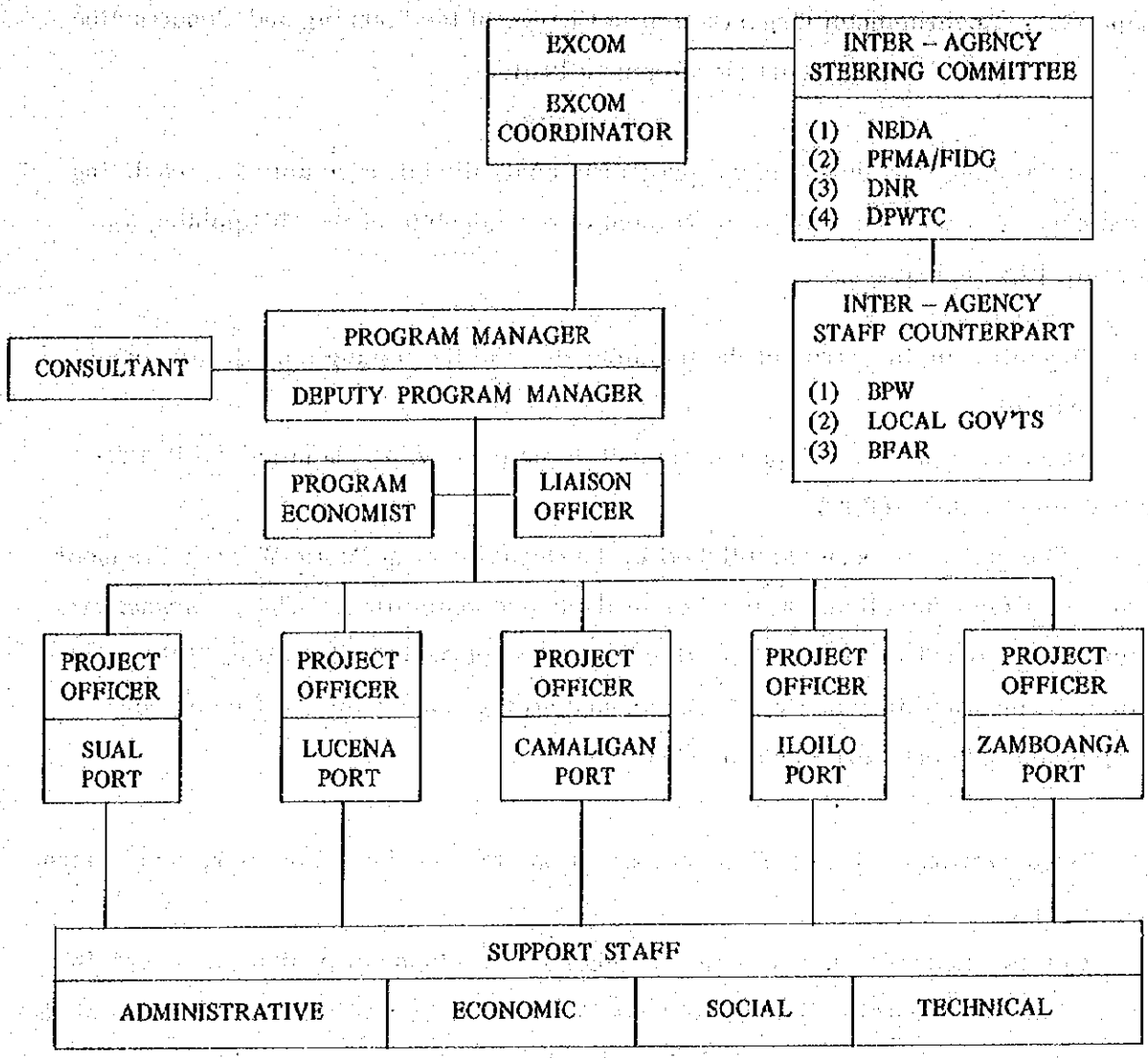


Fig. A-1-1 Nationwide Fishing Port Program

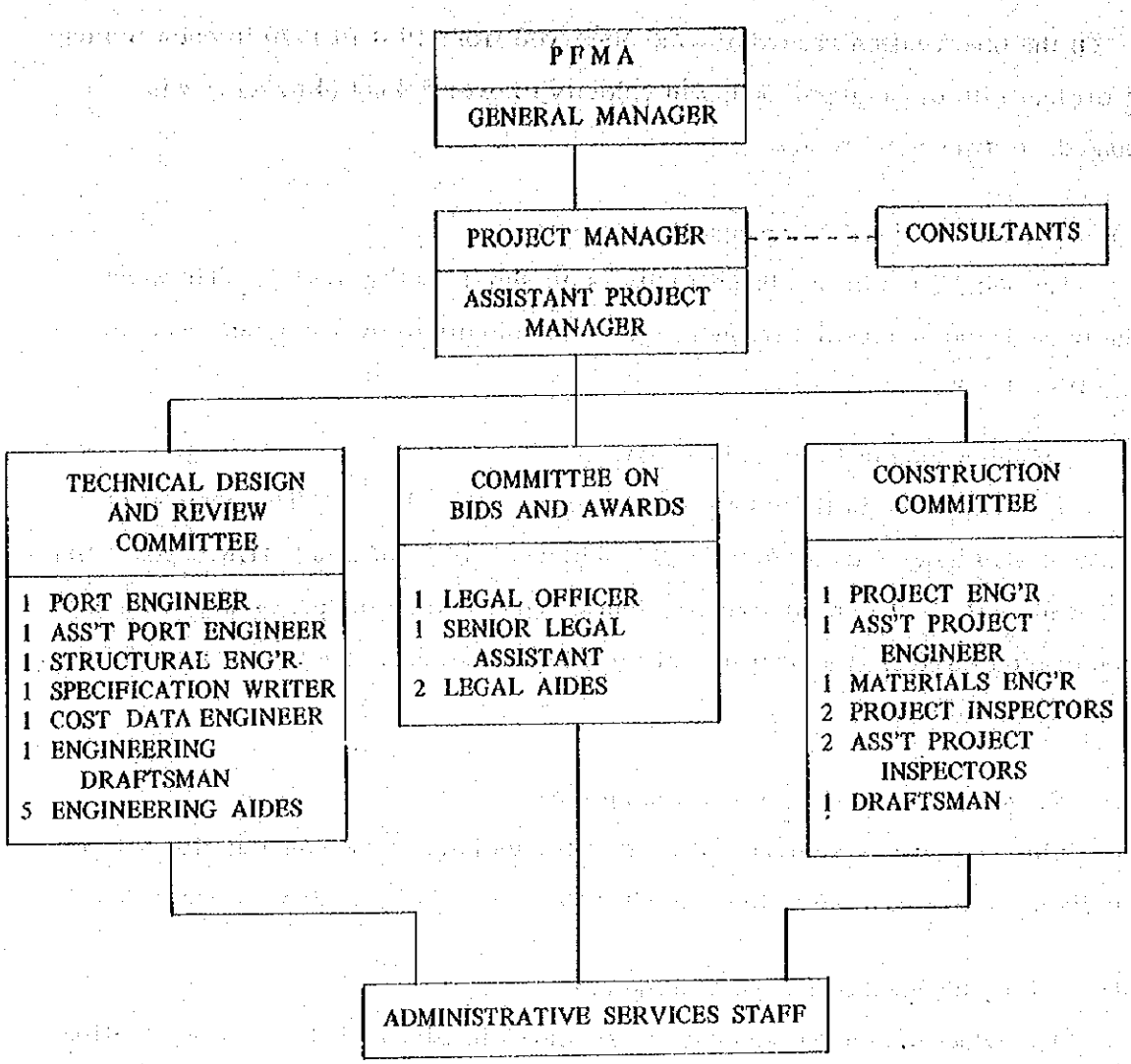


Fig. A-1-2 During Construction.

Chapter 2 Wind in the Neighborhood of Fishing Port Construction Sites

Of the observation record of wind observed from 1951 to 1970 in each fishing port project site or neighborhood, win velocity of over 8-knot (4m/sec.) was arranged, to draw wind roses.

(1) Neighborhood of Zamboanga fishing port

The wind rose in Zamboanga City is as shown in Fig. A-2-1. Throught the period, the generation frequency of wind velocity of over 4m/sec. was as small as 1.12%.

(2) Neighborhood of Iloilo fishing port

The wind rose in Iloilo City is as shown in Fig. A-2-2. The generation frequency of wind velocity of over 4m/sec. was 53.7%, of which 31.87% was wind in NE direction. The wind direction can be regarded as the prevailing wind direction in the district. The next prevailing wind direction was SW direction, just reverse to the above.

(3) Neighborhood of Camaligan fishing port

Since no observation data of wind in the vicinity of the construction site is available, the wind rose in Legazpi City is shown in Fig. A-2-3 for reference. .

(4) Neighborhood of Lucena fishing port

The wind rose in Lucena City is as shown in Fig. A-2-4. The generation frequency of wind velocity of over 4m/sec. was 19.23%, of which 6.5% was wind in NNE to NE direction.

(5) Neighborhood of Sual fishing port

Since no observation data of wind in the neighborhood of the construction site is available, the wind rose in Dagupan City located deep inside Lingayen Gulf is shown in Fig. A-2-5 for reference. The generation frequency of wind velocity of over 4m/sec. was 14.47%, and the prevailing wind direction was NNW direction. The highest wind velocity occurred also in this direction.

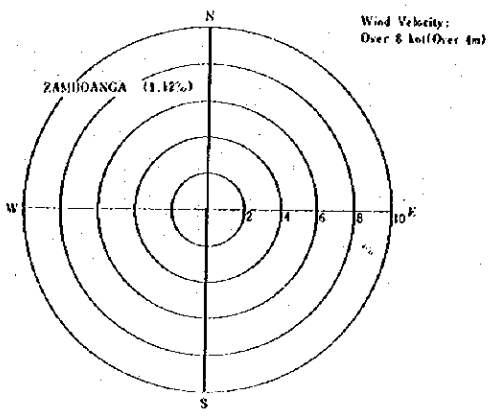


Fig. A-2-1 Wind Rose of Zamboanga

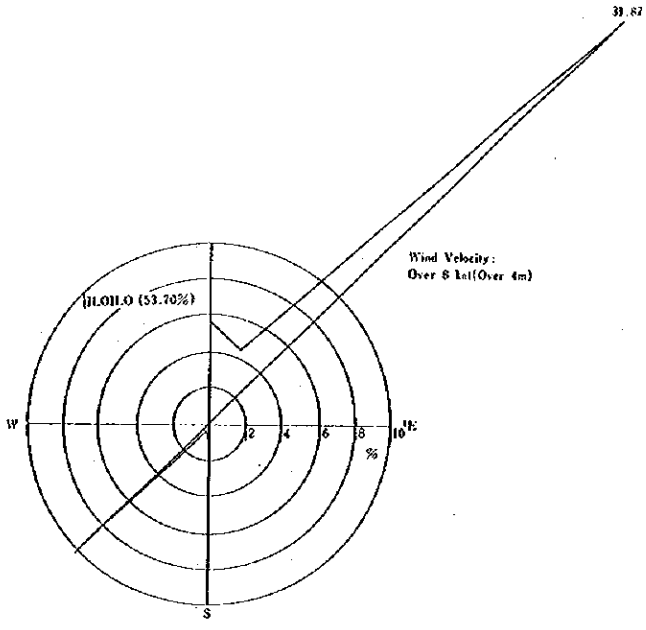


Fig. A-2-2 Wind Rose of Iloilo

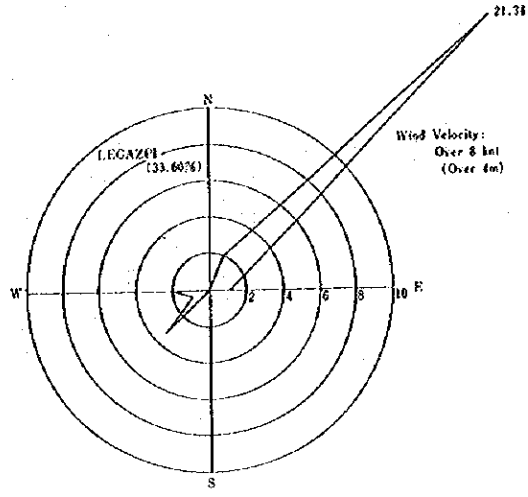


Fig. A-2-3 Wind Rose of Legazpi

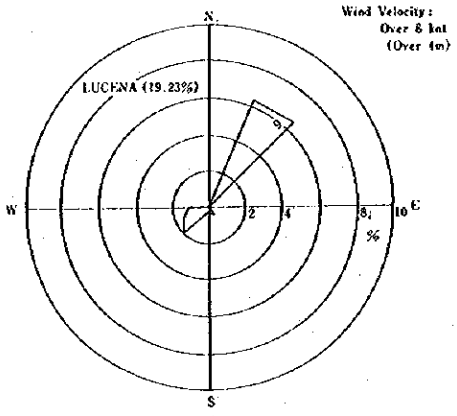


Fig. A-2-4 Wind Rose of Lucena

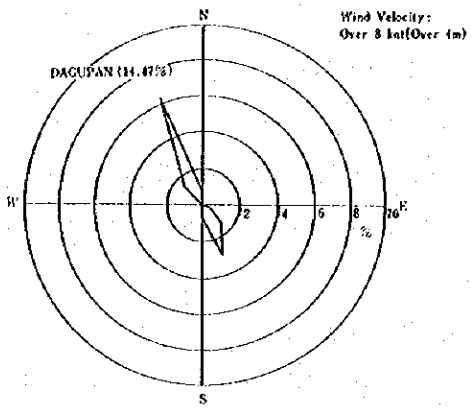


Fig. A-2-5 Wind Rose of Dagpan

Chapter 3 Calculation Method of Required Lengths of Quays

There are several methods of calculating required lengths of quays at fishing port. Methods generally used in Japan in planning fishing ports are as follows.

3-1 If sufficient survey data is available:

(1) Data analysis

1) Fish landing conditions for the past 3 years are checked by month, and two consecutive months which marked the largest landing volume is picked up from them.

2) From the two months picked up, days which marked the largest landing volumes is selected upto 10th day in the descending order, and their average is defined as the standard volume of use per day.

3) Average actual conditions in the major fishing season are checked, in reference to the kinds of fisheries, numbers of boats by class, handling hours, etc.

(2) Future forecast

Records of annual fish landing volumes and calling fishing boats for the past 5 years are checked, and based on the tendency found by this procedure and the intended annual fish landing volume and calling fishing boats of the target year, the standard conditions of use per day in future are estimated.

(3) Calculation of the required length of a quay

A required length is obtained by the following equation by water depth.

$$\text{Required length} = \Sigma \frac{N}{\gamma} \cdot L \cdot \beta$$

where L : Berth length = Boat length overall + allowance

N : Standard number of calling boats per day

γ : Berth turnover rate = $\frac{\text{Landing allowing hours}}{\text{landing hours per boat}}$

β : Quay accompany rate (to be 1 or less, considering economy, for fisheries which make seasonal use of 3 to 6 months per year)

3-2 If sufficient survey data is not available:

In this case, one method is to consider the standard conditions of use per day by kind of fishery as follows.

(1) Fisheries which take many days for one voyage

Boats are assumed to enter the port on the average (desirable also in light of stable fish prices).

(2) Fisheries which take short time for one voyage

If boats leave in the morning and return in the evening or leave in the evening and return in the next morning, then the number of port entry boats is assumed to be 70 to 90% (80% on the average) of the maximum capacity of the port.

Chapter 4 Fishermen Cooperative Association Development Program and the Present Situations of Fishermen's Organizations in the Philippines

4-1 Philippine Cooperatives Development Program

The Philippine Cooperatives Development Program was enforced in 1973, and BCD (Bureau of Cooperatives Development) actually plans and manages the program under the control of DLGCD (Department of Local Government and Community Development).

The purposes of this program are as follows:

(1) To organize small farmers

Small farmers are (a) those who own 7 ha. or less of land for producing rice or corn, (b) those who own 10 ha. or less of coconut field, or (c) those who have 24 ha. or less of sugar cane or other field.

(2) To organize small fishermen

Small fishermen are (a) those who are employed for fishing boats on wage or commission, (b) those who own small fishing boats of 3 tons or less, (c) those who own inland water nurseries of 1 ha. or less, (d) those who borrow inland water nurseries of 3 ha. or less, or (e) small marine products processors.

(3) To organize small enterprisers

The basic types of cooperatives are as follows:

(1) Samhang Nayon (SN)

This is the smallest unit of cooperatives, consisting of 25 or more fishermen. Regionally, it is an organization in a Barrco (town or village), and mainly functions to collect and sell products, loan funds, and spread techniques.

(2) Area Marketing Cooperative (AMC)

This is a cooperative consisting of 10 Samhang Nayons, and must have a capital of at least 10₱.

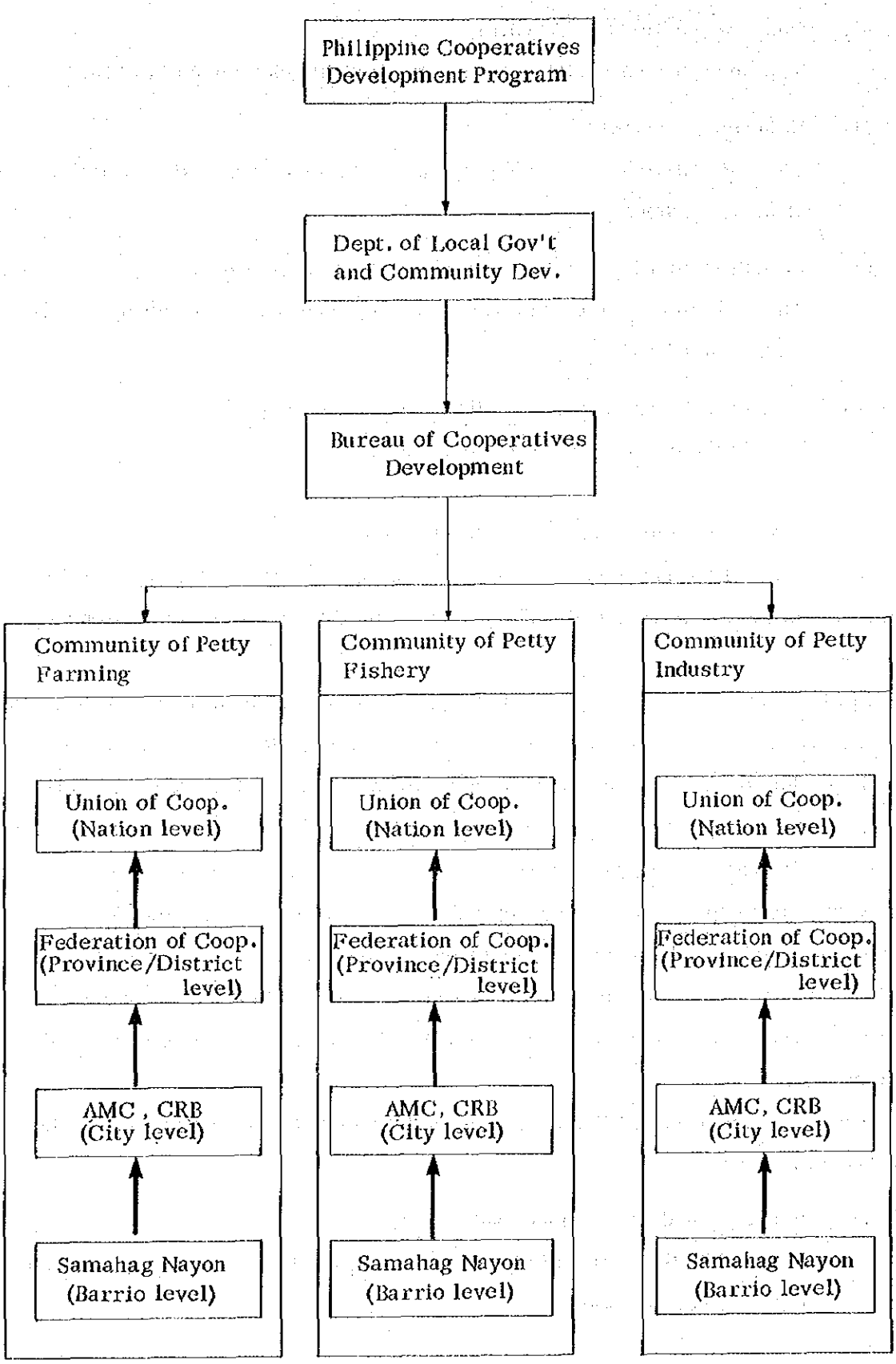


Fig. A-4-1 Development program of Fishery Cooperative Association

(3) Cooperative Rural Bank (CRB)

This must have a capital of at least 500,000₱, and consists of SNs.

(4) Kulusang Bayan (KB)

This must have at least 250 persons as its members, and a capital of at least 25,000₱.

(5) Katipunan Ng Kilusang Bayan (Federation of Cooperatives)

This is a cooperative of provincial or regional level, consisting of KBs, AMCs and CRBs.

(6) Katipunan Ng Kilusang Bayan (Union of Cooperatives)

This is the cooperative of national level.

4-2 Present situations of fishermen's organizations

As a policy of the Philippine Government, the Cooperatives Development Program described above is enforced. The present situations of actual operations are as follows.

In the construction sites of Sual fishing port and Zamboanga fishing port where many fishermen live, organizations of "5-person group" called Selda System are formed. In this system, five fishermen jointly own a fishing boat, and catch fishes and deliver them to a broker as one unit. Some Selda Systems are already financed by bankers. Actually, they have a strong tinge of cooperative working units.

They are groups as antecedents of organization activity. Since they have results in organizational activity, they suit the cooperative idea of national level mentioned above. If they are effectively combined with the administration and operations systems of fishing ports, they will be able to demonstrate considerable functions.

The actual situations of Samhang Nayons determined as upper level organizations are as follows.

1) In and around Zamboanga fishing port

As of 1978, there are 17 SNs in Zamboanga del Sulu Province, in which only 662 persons join.

2) In and around Camaligan fishing port

As of 1978, there are 27 SNs in Camalin Nulu Province, in which 1,121 persons join. A movement toward an integrated cooperative gradually progresses. The 27 SNs have been financed for 188,500₱ in 1978. In and around Camaligan fishing port where large fisheriy companies exist, capital accumulation and the organization of small fishermen are promoted steadily.

3) In and around Lucena fishing port

In 1976, one fishermen cooperative association was organized in Dalahican district, but because of an operational problem, it disappeared within one year.

4) In and around Sual fishing port

As of 1976, there were 14 SNs in Sual, in which 541 persons joined. They own a total capital of 42,028₱. In the entire Pangasinan province, there are a number of SNs, showing the characteristics of the land where there are many small fishermen.

TERMS OF REFERENCE

FOR

REVIEW AND COMPLEMENTARY STUDY

OF

THE FEASIBILITY STUDY REPORT, PACKAGE I,

ON FISHING PORTS IN THE PHILIPPINES

February, 1978

GOVERNMENT OF THE REPUBLIC OF THE PHILIPPINES

DEPARTMENT OF PUBLIC WORKS, TRANSPORTATION AND COMMUNICATIONS

TERMS OF REFERENCE

I. INTRODUCTION

(1) Background Information

The Government of the Republic of the Philippines conducted and completed the feasibility study for fishing ports in the Philippines. The fishing ports being studied are the ports of Iloilo, Dalahican, Camaligan, Sual and Zamboanga.

The organization mainly responsible for the study of the Government of the Republic of the Philippines is the Department of Public Works, Transportation and Communications.

The Government of the Republic of the Philippines requested the Government of Japan to review this feasibility study report for fishing ports in the Philippines in order to promote this development program with the Japanese economic and technical cooperation in this field.

II. OBJECTIVES OF THE STUDY

The principal objective of the study is to make review the feasibility study report of fishing ports in the Philippines, which was arranged by the Government of the Republic of the Philippines and to implement a complementary study, if required, in order to promote development and improvement of the fishing ports in the Philippines.

III. COURSE OF ACTION

The study will consist of two phases. The first phase addresses itself to the immediate needs of understanding for background of projects and the Governmental policy for the field of fishing ports development in the Philippines.

The second phase will be the implementation of the complementary study if any, and the field investigations for these fishery ports in order to know the present situation and grasp the whole project in the respective ports.

The study will be carried out along the line to review the technical, economic and financial aspects as well as marine products and marketing aspect of the project.

IV. SCOPE OF SERVICES

1. General

The scope of services are:

- to review the Feasibility Study Report of Fishing Port Package I, arranged by the Government of the Republic of the Philippines;
- to implement the complementary study for this project, if it is necessary; and
- to implement the field investigation at each projected site

The projected sites are listed as follows;

- Iloilo
- Dalahican
- Camaligan
- Sual
- Zamboanga

2. Review of Present and proposed Infrastructure

The consultant will examine present and proposed Fishing Port facilities and each projected port. He will review the government policies and plans concerned.

3. Review of Physical Data

The type of physical-hydrological studies necessary in order to implement any expansion or relocation of fishing port facilities recommended in the economic studies will be identified.

4. Review of Marine Products and Their Marketing

The contractor will examine the present and future forcast of marine products and their marketing. The fishing condition and flow of fishery boats are also examined to evaluate the size of investment. The study should not take no account of special character of fishing and fishery marketing in the Philippines.

5. Cost Estimate

The study will include revise of the preliminary cost estimated upon the current prices at the respective stages and for the respective basic fishing port facilities for the proposed layout.

6. Review of Financial and Economic Analyses

Based on the cost data developed in the engineering studies, financial analysis of the various improvements will be provided, including estimate of capital, maintenance and operations costs, impact on routine budget, appropriate sources of financing (including foreign aid), a schedule of harbour due and related revenues, and foreign exchange requirements.

The economic analyses will be based on opportunity costs of capital, shadow prices for labour, materials and relevant inputs and estimates of benefits including possible foreign exchange earnings.

The foregoing will be used as a basis for estimating benefit/cost ratios and internal rates of return of principal alternatives investigated.

V. SERVICES TO BE PROVIDED BY THE GOVERNMENT OF THE PHILIPPINES

Services to be provided by the Government of the Republic of the Philippines are listed as follows;

1. Supplement of engineering and economic data
2. Logistic support and exemption from taxes and duties
3. Preparation of working room and a photo copyer if required
4. Appointment or assignation of the official counterparts for study team
5. Making appointments to the authorities related to the study
6. Hotel and flight reservation in the case of field survey
7. Preparation and support of local transportation facilities for the field investigations such as cars and boats. And cars will be prepared for the transportation between air port and hotel.

VI. TIME SCHEDULE OF CONSULTING SERVICES AND REPORTS

A. Length of Contract

B. Reports

   1. Inception Report
   2. Progress Report
   3. Draft Final Report

SCOPE OF WORKS

FOR

REVIEW AND COMPLEMENTARY STUDY

ON

THE FEASIBILITY STUDY REPORT, PACKAGE I,

OF FISHING PORTS IN THE PHILIPPINES

February, 1978

JAPAN INTERNATIONAL COOPERATION AGENCY

I. INTRODUCTION

In response to the request of the Government of the Republic of the Philippines, the Government of Japan has decided to conduct a review and complementary study for the feasibility study report, published by the Government of the Philippines in accordance with laws and regulations in force in Japan, and the Japan International Cooperation Agency (JICA), the official agency responsible for the implementation of technical cooperation programs of the Government of Japan, will carry out the study.

The present document sets forth the scope of work in regard to the above-mentioned study which is to be carried out in close cooperation with the Government of the Philippines and authorities concerned.

II. OBJECTIVE OF THE STUDY

Objective of the study is to review the feasibility study report of fishery ports in the Philippines, which was arranged by the Government of the Republic of the Philippines, and to implement a complementary study, if it is necessary, in order to promote development and improvement of fishing ports in the Philippines as part of the economic and technical cooperation conducted by the Government of Japan.

III. OUTLINE OF THE STUDY

(1) Basic principles of the study

The basic principle of the study are,

a) to understand clearly for background of projects.

b) to grasp the Governmental policy for development of fishing ports in the Philippines.

c) to promote appreciation about the Governmental basic consideration for development and improvement of fishing ports.

d) to collect technical information and data requested by the Japanese Government for acceleration of procedures required for development of fishing ports in the Philippines.

(2) Course of action

The study will be carried out in two stages as given below;

a) to receive general explanation about the feasibility report of fishing ports in the Philippines and exchange opinions with each other for furtherance of the understanding;

b) to carry out complementary study and field investigation/inspection at the following project sites;
Fishing Ports of Iloilo, Dalahican, Camaligan, Sual, and Zamboanga.

IV. REPORT

The JICA will prepare and submit the following reports to the Government of the Philippines.

(1) Inception Report

This report will include the program and schedule of study on the fishing ports of the Philippines. The program and schedule will be discussed with the Government of the Philippines at the beginning of field investigation/inspection after arrival at Manila.

(2) Final Draft Report

Final draft report will include the conclusion and recommendation upon thorough review of the feasibility report of fishing ports in the Philippines.

The result of the complementary study will also be described in this report.

This report will be submitted to the Government of the Philippines within three months after completion of the field investigation/ inspection. No interim report will be provided.

(3) Distribution of reports

The reports will be made in English in the following number of copies respectively for distribution:

Inception Report	30 copies
Final Draft Report	60 copies
	(3 Authorities x 20 copies)

V. UNDERTAKING OF THE GOVERNMENT OF THE PHILIPPINES

(1) To provide necessary data and available information for the study team.

(2) To exempt the study team from taxes and duties on the materials, equipment and personal effects brought into the Philippines by the study team.

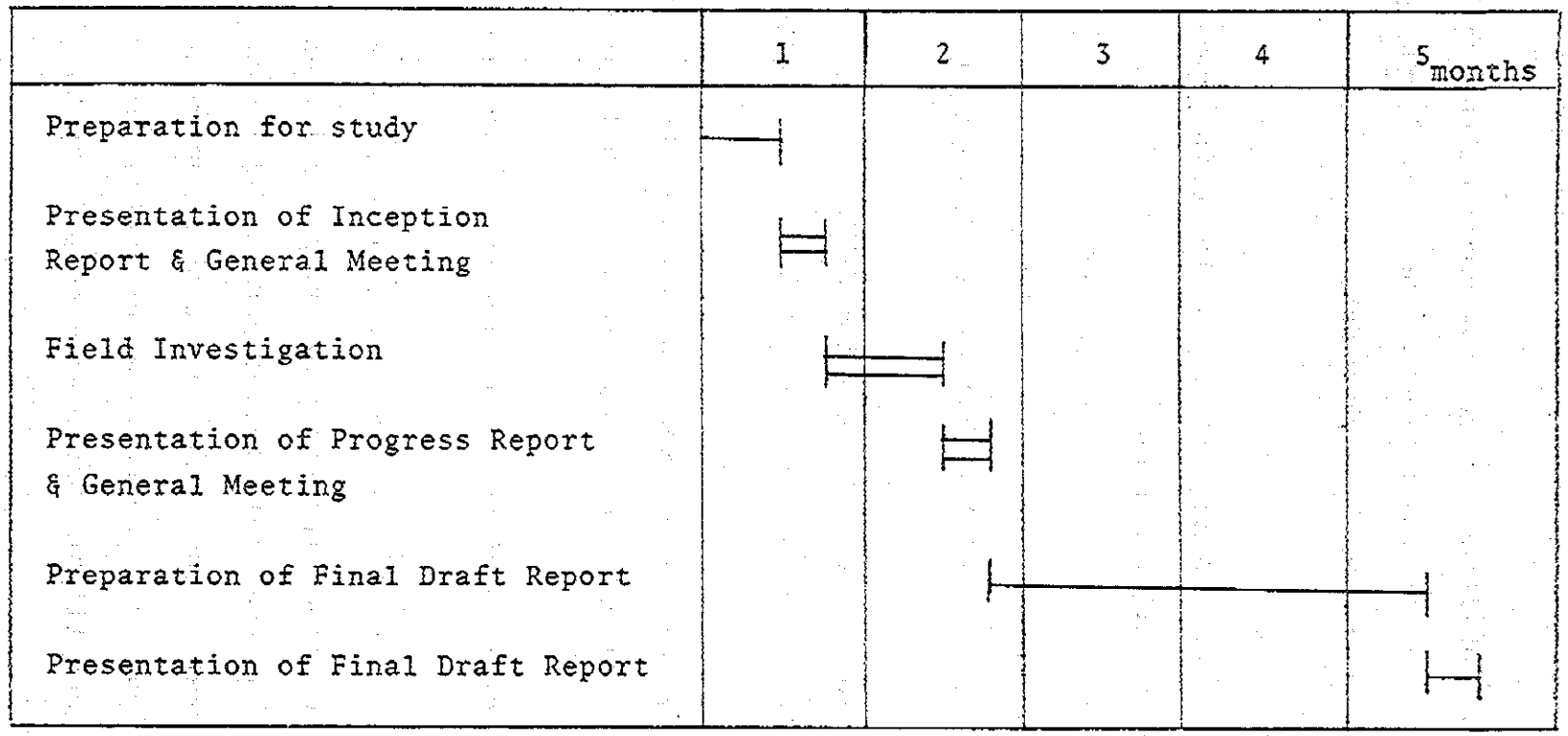
(3) To assign the official counterparts during the field investigation.

(4) To make arrangement for visit to the authorities concerned.

(5) To provide the study team with transportation facilities, such as cars and boats for the field investigation and inspection.

(6) To support the travel of the study team with arrangement and reservation of flight seat and hotel at projected ports. (But hotel charge and flight charge will be paid by the study team itself.)

VI. SCHEDULE



Note: ═══ to be done in Philippine by Japanese Study Team

——— to be done in Japan by Japanese Study Team

INCEPTION REPORT

OF

THE REVIEW AND COMPLEMENTARY STUDY

FOR

THE FEASIBILITY STUDY REPORT, PACKAGE I,

ON FISHING PORTS IN THE PHILIPPINES

February, 1978

JAPAN INTERNATIONAL COOPERATION AGENCY

INTRODUCTION

This Report is made on the basis of the Scope of Work set by both the Philippines and Japan and covers the matters to be confirmed in detail to carry out a review and complementary study in the Philippines on the fishing ports development project in the Philippines.

1. Objective of Study

The principal objectives of the study in the Philippines are to carry out the following study:

(1) Interview;

(2) Field Investigation and Inspection; and

(3) Data Collection

2. Contents of the Study

2-1. Interview

Interview will be carried out at Manila and several projected sites for the items described below:

(1) Sites

1) Manila Metropolitan Area;

2) Proposed project sites;

Iloilo City	East Visayan Region
Dalahican	Quezon Province, Southern Tagalog Region
Camaligan	Camarines Sur, Bicol Region
Sual	Pangasinan, North and Central Luzon
Zamboanga City	Western Mindanao Region

3) Fishing Ports and Commercial Ports related to proposed fishing ports and project sites

Port of Manila

Fishing Port Complex - NABOTAS

Port of Zamboanga

(2) Requested Authorities

1) Central Government Authorities

- The National Economical and Development Authority (NEDA)
- The Department of Public Works, Transportation and Communications (DPWTC)
- The Bureau of Public Works (BPW)
- The Planning and Project Development Office (PPDO)
- The Philippine Fish Marketing Authority (PFMA)
- The Department of Natural Resources (DNR)
- The Bureau of Fisheries and Aquatic Resources (BFAR)

2) Local Government Authorities at each Project sites

- Representative Office of Central Government Authorities
- Regional/Provincial Government Authorities
- Other Authorities concerned to the project

2-2. Field Investigation and Inspection

(1) Proposed Project Fishing Port:

- Iloilo Port;
- Dalahican Port;
- Camaligan Port;
- Sual Port; and
- Zamboanga Port

(2) Existing Fishing Complex:

- NABOTAS Fishing Port Complex

(3) Commerical Port considerable to be related:

- Port of Manila; and
- Port of Zamboanga

2-3. Data Collections

(1) Marine Products and Marketing:

1) Flow of marine product and its consumption;
2) Fishing boat condition in recent years;
3) Marketing;
4) Organization, systems and procedures;
5) Regulations; and
6) Others

(2) Port Data:

1) Port operation
2) Financial/Economic
3) Cost Analysis
4) Traffic Analysis
5) Organization, systems and procedures
6) Labour/Manpower
7) Regulations
8) Land acquisition
9) Others

(3) Macro-economic

1) Population growth in Nation/Region
2) Production (GDP/GRP)
3) Economic activity in region
4) Demand and supplement
5) Others

(4) Port Engineering

1) Geological Conditions

2) Meteorological Conditions

3) Hydrological Conditions

4) Sub-Soil Condition

5) Topographical Conditions

6) Seismic Conditions

3. Basic Conception

(1) Effective use of the marine resources does not remain merely in the supply of protein sources to the regional inhabitants but is connected to promotion of the regional economy and in turn to that of the important industries supporting the development of the national economy.

Here, it would ~~not~~ be ~~necessary~~ understood to specifically state that the promotion of the fishery industry should be advanced in harmony with the other industries and as part of the national economy development plan.

(2) With development of the fishing ports and improvement of the storages, processing plants and other facilities of the catches, the fishery industry has increasing influences upon the regional economy and comes to support the regional economy itself finally.

(3) The fishing port facilities require a large amount of investment for development with much time needed for construction. On the other hand, they are usually of long durability of 30 to 50 years.

Development of the fishing port facilities should, therefore, be carried out according to a master plan standing on a long ranging prospect. Being enmeshed in the economic change in a relatively short term, if the development of the fishing port facilities and other infrastructures is delayed, expedited or otherwise controlled excessively or reduced in disregard of the master plan, it will leave regrets to the late years.

(4) However, since a large amount of investment is required for development of the fishing port facilities, it is important to grasp the adequate size of the fishing port facilities precisely upon forecasts of the scale of demand for catches and that of supply of the resources and the utilizing fishing boats and consider so that maximum effect is provided with minimum investment.

(5) From the foregoing point of view, it is desirable that the proposed development of Iloilo and other four ports should, of course, be directed toward promotion of the fishery industry but, at the same time, be planned with consideration that the ports will be able to participate positively in the regional development of the area concerned.

That is, the development should not remain merely in accommodating the fishing boats belonging to the respective ports. It is effective to plan the development in harmony with the development plans of the related infrastructures with consideration for elevation of the regional industries from the primary to secondary industries through modernization of the distribution markets and promotion of the industries using the catches as materials.

4. Japanese Study Team Member List

(1) Shinji HAYASHI (Team Leader)

Former President

ALL JAPAN FISHING PORT ASSOCIATION

(2) Masafumi SUGIE

Deputy Chief, Construction Division

Fishing Port Department, Fishery Agency

(3) Kazuhiro KOSHIRO

Director, Planning

The Overseas Coastal Area Development Institute of Japan (OCDI)

(4) Sadatoshi IIBUCHI

Processing Expert, Former Director

Kanagawa Fisheries Training Center

(5) Kametaro WASHIZU

Fisheries Expert

Universal Marine Consultant Co.,LTD. (UNIMAC)

(6) Tateo KUSANO

Economist, President

System Science Consultants Inc. (SSC)

(7) Takashi YAMANAKA

Staff, Japan International Cooperation Agency

5. TIME SCHEDULE OF THE STUDY

Feb. 20	(Monday)	Japanese Mission arriving in Manila (7 members)
21	(Tuesday)	Courtesy call and meeting at Embassy of Japan and JICA office
22	(Wednesday)	Courtesy call to the Government of the Philippines (9:00 NEDA) Submitting the Scope of Works and Inception Report at the General Meeting
23	(Thursday)	Courtesy call to the Government of the Philippines (9:00 Department of Natural Resources; 10:30 Bureau of Fisheries and Aquatic Resources; 15:00 D P W T C)
24	(Friday)	9:00 Technical Meeting P P D O Data collection
25	(Saturday)	Field trip to Sual (Pangasinan) by coaster
26	(Sunday)	Data analysis
27	(Monday)	Courtesy call, data collection and field inspection at Sual
28	(Tuesday)	The team moves to Dalahican.

Mar.	1 (Wednesday)	Courtesy call, data collection, and field inspection at Dalahican
	2 (Thursday)	Data collection and interview
	3 (Friday)	The team moves to Camaligan (Bicol)
	4 (Saturday)	Courtesy call, data collection and field inspection of Camaligan
	5 (Sunday)	Data processing and analysis
	6 (Monday)	Data collection, and the team moves to Manila.
	7 (Tuesday)	The team moves to Iloilo via Legaspi and Cebu.
	8 (Wednesday)	Courtesy call, data collection and field inspection at Iloilo
	9 (Thursday)	Interview and data collection
	10 (Friday)	- ditto -
	11 (Saturday)	Data processing and analysis
	12 (Sunday)	The team leaves Iloilo and moves to Zamboanga via Cebu.
	13 (Monday)	Courtesy call, data collection and field inspection of Zamboanga
	14 (Tuesday)	Data collection
	15 (Wednesday)	The team leaves Zamboanga for Manila.
	16 (Thursday)	General meeting (regarding the Progress Report - draft)
	17 (Friday)	- ditto -
	18 (Saturday)	Submitting the Progress Report, expressing the Japanese team's gratitude to the Government of the Philippines
	19 (Sunday)	Holiday
	20 (Monday)	Reporting to the Embassy of Japan
	21 (Tuesday)	The team leaves Manila for Tokyo by PR 408.

PROGRESS REPORT

OF

THE REVIEW AND COMPLEMENTARY STUDY MISSION

ON

THE FEASIBILITY STUDY REPORT, PACKAGE-I

OF FISHING PORTS IN THE PHILIPPINES

MARCH, 1978

(Retyping Copy)

JAPAN INTERNATIONAL COOPERATION AGENCY

PROGRESS REPORT

TABLE OF CONTENTS

I. INTRODUCTION

This report, following the Terms of Reference and the Scope of Works set by the Government of the Philippines and the Government of Japan, respectively, contains the progress of the review of the Nationwide Fishing Port Project-Package I, as established in the Inception Report dated February 1978, of the Japanese Review and Complementary Study Mission hereinafter refferred to as the Japanese Mission.

This report also contains the preliminary conclusions and recommendations of the Japanese Mission on the five fishing ports included in Package I.

II. PRINCIPAL OBJECTIVE OF THE STUDY

The objective of the study is to review the feasibility study report on the Five Fishing Ports under Package I prepared by the Government of the Philippines, and to conduct, if necessary, a complementary study in order to promote the development and improvement of fishing ports in the Philippines, as part of the economic and technical cooperation of the Government of Japan.

The review and complementary study was carried out through the following activities:

1. Interview
2. Field Investigation and Inspection
3. Data Collection

These activities were carried out in each of the five fishing port locations.

III. MAIN FINDINGS AND CONFIRMATIONS

As a result of field inspection/investigation and complementary study, the following items were confirmed:

1. Trends of the Fisheries Industry in recent years.
2. Policies for the promotion of Fisheries Industry required for future development.
3. Urgency of the development of the fishing ports.
4. Criteria for the selection of the port sites and their significance in the influence areas.
5. Present conditions of fisheries industry at the selected sites.
6. Target years required for the completion of the proposed fishing ports (2000 AD for the full development of the port master plan and 1980 - 1990 for the development of basic operational port facilities).
7. Layout of the main and ancillary port facilities.
8. Future forecast of fishing vessels calling at the ports and the volume of fish landings up the year 2000 AD target year).
9. Utilization of the fishing port facilities - landing quays, berthing and lying areas - by different types of fishing vessels.

10. Technical aspects of natural site conditions, involving geologic, hydro-topographic, hydro-meteorologic and tidal charactersitics.
11. Unit prices of main construction materials and labor rates/wages at the proposed project sites.
12. Period and schedule of planning and construction works.
13. Methodology for forecasting fish demand and supply, financial analysis and economic evaluation.
14. Prices of fish and related items for fisheries, like ice, fuel, etc.
15. Management, operation and organization of fishing port complexes.
16. Necessity of the completion of the ancillary and supporting facilities, particularly cold storage, freezing and ice plants, administration building and ship repair/slipway facilities in the same construction period as the basic port facilities.
17. Land use and land acquisition.

IV. TENTATIVE CONCLUSIONS AND RECOMMENDATIONS

On the basis of the field investigation and inspection, the following tentative conclusions and recommendations were arrived at by the mission:

1. Requirements for fisheries development

On the basis of the analysis of the

present status of the fisheries sector and on the field survey on the present fish landing sites, requirements for the immediate development of fishing ports were justified.

2. Selection of the port site

It was confirmed that the location of the fishing ports recommended for development were selected on the basis of:

a. considerations for a balanced regional development, including social and economic aspects.

b. minimum technical/engineering constraints in port construction.

3. Projection of the number of the fishing vessels and fish landings

It was verified that projection of the number of the fishing vessels by type and fish landings in the target years 1990 AD and 2000 AD conforms with the quantities projected in the feasibility study.

4. Planned period

While the target year for the master plan of the fishing ports is 2000 AD, the first phase of actual construction of the basic port facilities (such as breakwater and quay wall) is scheduled for completion by 1981, and the functional facilities required till 1990 are to be constructed also by 1981. The expansion

of facilities required till 2000 AD will be constructed in the second phase.

In veiw of the urgency of the problems resetting the fishery industry especially those caused by the absence of fish landing, handling and marketing facilities, the fishing port projects should be started as soon as possible.

5. Scale of Investment

The amount of investment estimated for each of the fishing ports is commensurate to the projected production capacity and rate of utilization as estimated in the planned period.

It is suggested that the required length of mooring facilities be estimated using one of the methodologies commonly accepted and already tested in Japan.

6. Selection of construction materials and their places of production

The principal method of port terminal construction work which is through reclamation is considered economical.

For the sake of making the structures simple and easy to construct, the sloping type of breakwater with rubble stone is suggested for the design of breakwater facilities at each fishing port.

It seems advisable, in order to reduce capital investment for the establishment of

fishing port and to allow easy construction of the quay walls, to design sheet pile structure for quay wall. Moreover, it is also suggested that the type of structures to be used in designing the slipways and stair-landing facilities be made simple. It is confirmed that the principal construction materials are easily obtainable in good quality and in adequate quantity at the area around each project site.

It is confirmed that the choice of structures incorporated in the design of port facilities is partly dependent on the availability of construction materials, thus:

a) Since the sub-soil conditions at the Camaligan port site are rather soft for construction of port facilities, the port facilities should be carefully constructed (especially the quay wall structure).

d) It is necessary to provide carefully against erosion, which is expected to occur at the toe of the exposed side of the breakwater at Lucena port.

c) The breakwater at Iloilo port is expected to be subjected to serious attack by big waves, especially during the southwest monsoon period and during typhoon season, and is also exposed to strong current along

Iloilo Strait. Therefore, it is necessary to provide carefully against erosion at the toe of the breakwater.

d) It seems advisable to use steel sheet piles for the vertical wall type quay wall at each proposed port site due to the following reasons:

i) Workable construction materials should be used for quay wall construction works to expedite completion of port at the shortest possible time and steel sheet piles are easier to handle, transport and install. and install.

ii) The main construction materials for the quay wall should have excellent properties to be able to withstand adverse sub-soil, tidal and seawater corrosive conditions at the various project sites.

iii) It is essential to maintain high reliability and quality control of construction materials at both design and construction phases.

e) It is better to use the rubber fender for the quay walls, because many fishing boats are built of wood with very weak hulls. Vertical setting of rubber fender is particularly suitable for small fishing boats.

7) The improvement of the administration and operation organization

The improvement of the quality and quantity of management and administration staff fishing port operation are indispensable for optimizing the use of fishing port complexes when they are completed.

It is suggested, therefore, that the following complementary programs be considered concomitant with the construction of the port complexes.

a) Upgrading of the administrative and organizational capabilities of the port operation agency;

b) Modernization of the methods and procedures for the administration and operation of the fishing port complexes;

c) Systematic training of technical staff required for the fishing port operations;

d) Provision of sufficient number of officers and staff to the port operations authority with clearly defined duties and responsibilities.

APPENDIX I

Implementation of the Study

Feb. 20 (Monday) 1978		Mission arrived Manila by JL 74
21 (Tuesday)	9:00	Interview to Asian Development Bank (Mr. Azam, Chief of Fisher Division, and Mr. Kudo, Chief of Port and Transportation Division.
	14:30	Courtesy call to NEDA (Mr. Eduardo Corpuz, Deputy Director General, and Mr. Jesus Sunga, Director for Infrastructure; Mr. Pete N. Prado Director, Planing and Project Development Office, Department of Public Works, Transportation and Communications.
		Field inspection for Navotas Fishing Port Complex.
Feb. 23 (Thurs.)	9:00	Courtesy call and interview to the Department of Natural Resource (Secretary Jose R. Leido, Jr., and Assistant Secretary J. Antonio Aguenza).
	10:30	Courtesy call and interview to the Bureau of Fisheries and Aquatic Resources (Director Feliz Gonzales).
	14:00	Courtesy call and interview to the Department of Public Works, Transportation and Communications (Secretary Alfredo L. Juinio and Assistant Secretary Teodoro T. Encarnacion).
Feb. 24 (Fri.)	9:00	Technical meeting with PPDO staffs.

Feb. 25 (Sat.)	8:00	Study team moved to Sual (Pangasinan)
	13:00	Courtesy call to Governor, Data Collection.
Feb. 26 (Mon.)	9:00	Interview and data collection to Bureau of Fisheries (BFAR) and Bureau of Public Works (BPW).
Feb. 28 (Tues.)	7:00	Leave for Lucena City (Dalahican).
	16:00	Arrive at Lucena City.
March 1 (Wed.)	9:00	Courtesy call to Governor and Mayor. Data collection to BFAR and BPW.
	11:00	Field inspection.
March 2 (Thurs)	9:00	Data collection and field inspection.
March 3 (Fri.)	9:00	Data collection and field inspection.
March 4 (Sat.)	7:00	Leave for Naga City (Camaligan)
	15:00	Courtesy call to Governor and Mayor.
March 5 (Sat.)	9:00	Field inspection at Camaligan and San Miguel Bay.
March 6 (Mon.)	9:00	Data collection.
	14:00	Leave for Legaspi City.
March 7 (Tues)	9:00	Leave for Iloilo City from Legaspi.
	11:30	Arrive at Iloilo City.
	15:00	Courtesy call to Governor and Mayor. Data collection at BFAR and BPW.
March 8 (Wed.)	9:00	Field inspection and data collection.
March 9 (Thurs.)	9:00	Data collection and field inspection.
	13:00	Leave for Cebu City from Iloilo City.

March 10 (Fri.)	11:00	Leave for Zamboanga from Cebu.
	15:00	Courtesy call to Governor and Mayor.
March 11 (Sat.)	9:00	Data collection and field inspection
March 12 (Sun)	9:00	Field inspection.
March 13 (Mon.)	8:00	Data collection
	11:00	Leave for Manila from Zamboanga.
March 14 (Tues)	10:00	Technical meeting with PPDO staffs at PPDO room.
March 15 (Wed.)	9:00	Data analyses and arrangement of Progress Report (Draft).
March 16 (Thur.)	9:00	Technical meeting with PPDD at Conference Room.
March 17 (Fri.)	10:00	General meeting with DPWTC, PPDO, NEDA, BFAR, and authorities concerned.
March 18 (Sa.)	10:00	General meeting (continued). Data analyses.
March 19 (Sun)		Data analyses.
March 20 (Mon)		Report to Embassy and JICA Manila Office.
March 21 (Tues)		Study Team leave for Japan.

LIST OF DATA COLLECTED

KIND OF DATA	NO.	NAME OF DATA	PUBLISHER	REMARKS
1. Topographical Map	1	Lucena, Sheet No. 3361 IV	Authority of the Board of Technical Surveys and Maps	1/50,000
	2	San Fernando, Sheet No. 3069 I	- ditto -	-ditto-
	3	Santo Tomas, Sheet No. 3068 I	- ditto -	-ditto-
	4	Dagupan City, Sheet No. 3068 V II	- ditto -	-ditto-
	5	Sual, Sheet No. 3068 III	- ditto -	-ditto-
	6	Lucap Bay, Sheet No. 3068 IV	- ditto -	-ditto-
	7	Alaminos, Sheet No. 2968 II	- ditto -	-ditto-
	8	Tomboc Bay, Sheet No. 2968 I	- ditto -	-ditto-
	9	Bolinao, Sheet No.	- ditto -	-ditto-
	10	Manicahan, Sheet No. 3441 III	- ditto -	-ditto-
	11	Zamboanga, Sheet No. 3440 IV	- ditto -	-ditto-
	12	Naga City, Sheet No. 3660 IV	- ditto -	-ditto-
	13	Iloilo, Sheet No. 3552 III	- ditto -	-ditto-
	14	Manila & Quezon City	Morbai Enterprises	1/50,000
2. Sea Chart	1	San Miguel and Lamit Bays	Philippine Coast and Geodetic Survey	1/100,000
	2	Lucena Anchorage, Pagbilao Bay and Port Laguimanoc	- ditto -	1/40,000
	3	Cabral to Sn.Fernando Pt. and Dapitan B. to San Miguel B.	London	1/50,000
	4	Tablas Strait with part of Sibuyan Sea	London	1/200,000

List of Data Collected, continued

KIND OF DATA	NO.	NAME OF DATA	PUBLISHER	REMARKS
2. Sea Chart, cont'd.	5	Iloilo Strait and Guimaras Strait	London	1/50,000
	6	Cuyo Is. to Cabra Is. Mindoro Strait and Sibuyan Sea	London	1/500,000
	7	Panay, Negros and Cebu	London	1/200,000
	8	Basilan Strait	London	1/100,000
	9	Basilan Strait to Camiguin Island	London	1/500,000
	10	San Miguel Bay to Leyte Gulf	London	1/500,000
3. Price List of Construction Materials	1	Price of Construction Materials at Sual in 1977	Public Works District	
	2	Price Inventory of Construction Materials of Jan., 1978, Lucena	Lucena City Engineer	
	3	Construction Material Prices (1977), Standard	BPWTC	
4. List of Wages	1	Monthly, Daily and Hourly Rate Schedule, Lucena	Lucena City Engineer	
	2	List of Classes and Salary Ranges	Lucena City Engineer	
	3	Rules & Regulations Implementation, Presidential Decree No. 928	Government of the Philippines	Minimum Wage Law
5. Sub-Soil Condition	1	Report of the Sub-Surface Investigation of Zamboanga City Port	Bu. of Public Works,Manila	Sept.19,1969
	2	Geologic Evaluation Report Manila-Bataan Coastal Road Project	B P W	
	3	Boring Data, No.1, No.3, No.4, Camaligan	Bu. of Public Works	

List of Data Collected, continued

KIND OF DATA	NO.	NAME OF DATA	PUBLISHER	REMARKS
5. Sub-Soil Condition, continued	4	Final Report, Subsurface Exploration, Sual Fishing Port, Pangasinan	Technotest, Inc.	1976
6. Sounding Drawing	1	Cross Sections of Bicol River	National Irrigation Administration Regional Office IV	No.2, No.3, No.4, No.5, No.6, No.7
	2	Profile of River Bed, Bicol River	- ditto -	
7. Socio-Economic (Planning)	1	Socio-Economic Profile of Pangasinan	Pangasinan Prov.	1977
	2	Statistical Data of Pangasinan	Pangasinan Prov.	
	3	Socio-Economic and Physical Profile, Lucena City	City Planning & Development Staff	1977
	4	Principal Map of Urban Planning	City Planning & Development Staff	1977
	5	Our Trembling Island	By Mr. Arturo Alcaraz	1976
	6	Projected Population of Projected Areas (1975, 1980,1985,1990,1995, and 2000 A.D.)		
	7.	Philippine Industry and Investment	The Board of Investments	Vol. II, 1st 2nd
8. Planning	1	The Regional 5-10 Year Plan, Southern Tagalog Region, 1978-1982-1987	Regional Development Council,NEDA Regional Office	1977
	2	Fishing Port Package I	Government of the Rep. of the Phil., PPDO	Vol. I - IV
	3	Five-Year Philippine Development Plan	Gov't. of the Republic of the Philippines	1978 - 1982
	4	Regional 5-10 Year Plan, Southern Tagalog Region	Regional Development Council,NEDA	1978 - 1987

List of Data Collected, continued

KIND OF DATA	NO.	NAME OF DATA	PUBLISHER	REMARKS
9. Designing	1	Actual Sections of Breakwater of Navotas		
	2	Plan, Location of Section of Breakwater & Slope Protection		1976
	3	General Plan of Navotas		1976
	4	Dredging Section, Navotas		1976
	5	Piers 2-5, Detail Section		1976
	6	Plan & Section of Haulage Ramp		1976
	7	Pier 1, Plan, Elevation, Section & Details		1976
	8	Elevation & Details, Connection of Timber Fender		1976
	9	Plan & Extent of Reclamation, No.8, No.9		1976
	10	Part Plan & Section of Pier on Slope Protection, No.2 Pier		
10. Hydraulic	1	Tide and Current Table, Philippines	Bu. of Coast & Geodetic Survey	1977
11. Seismic Data	1	Seismic Data in the Philippines and Map		
12. National Economic Data	1	Ten-Year Fisheries Development Plan, 1978-1987		
	2	Scenario: Philippine Fisheries, Year 2000		
	3	Fisheries Resources Management (Firm) Program Plan for 1978	Dept. of Natural Resources, Jan. 1978	
	4	Firm Perfonmance Report July 1975, Dec. 1977		
	5	Investment Opportunities in the PHilippines	Board of Investments, Aug.1977	

List of Data Collected, continued

KIND OF DATA	NO.	NAME OF DATA	PUBLISHER	REMARKS
12. National Economic Data, continued	6	Philippine Industry and Investment	The Board of Investments, Vol.II, 1st Qtr. 1977	
	7	- ditto -	- ditto - 2nd Qtr. 1977	
	8	Philippine Statistical Yearbook, 1977	National Economic & Development Authority, Rep. of the Philippines	
	9	Fisheries Statistics of the Philippines	Fishery Economics & Information Div. Bu. of Fisheries & Aquatic Resources, Manila,Phil.	
	10	Philippine Fish Marketing & Distribution Study, Main Report, Vol.1, Vol.2, Vol. 3, Vol.4, Vol.5A, Vol.5B, Vol.6, Vol.7	Dept. of Natural Resources, Bu. of Fisheries & Aquatic Resources, Rep. of the Phil.	
	11	The Tariff & Customs Code of the Philippines, 1977	A. Cacho Hermanos, Inc. Handbook	
13. Regional Economic Data	1	Distribution of Fish Traded at the Navotas Fishing Port & Fish Market,Sep'77		
	2	PFMA, Fish Market News Bulletin, Vol.1, No.283	Phil. Fish Marketing Authorities	
	3	Distribution of Fish Traded at the Navotas Fishing Port & Fish Market	Dept. of Natural Resources, Rep. of the Phil.,May'77	
	4	Primer	P F M A	
	5	Towards a Common Direction in Fisheries Development	Fishing Industry Dev. Council	
	6	Pres. Degree No. 1977	P F M A	
	7	Five-Year Western Mindanao Deveopment Plan, 1978-1982	Reg. Dev. Council, Reg. 2X, NEDA,	
	8	Socio-Economic Profile, Zamboanga City, 1975	Zamboanga City	
	9	Framework Plan, Lucena City	Lucena City	

List of Data Collected, continued

KIND OF DATA	NO.	NAME OF DATA	PUBLISHER	REMARKS
13. Regional Economic Data, continued	10	Socio-Economic & Physical Profile, Lucena City, 1977	Lucena City	
	11	Five-Year Bicol Region Development Plan, 1978-1982	Reg. Development Council, Reg.V, NEDA	
	12	Socio-Economic Profile, Vol.4, City of Naga	Naga City	
	13	Socio-Economic Profile, Vol.2, Camaligan	Camaligan	
	14	Comprehensive Urban Development Plan, 1977-2000, City of Iloilo	Iloilo City	
	15	Five-Year Western Visayas Region Development Plan, 1978-1982	Reg. Development Council, Reg.VI, NEDA	
	16	Pangasinan Planned Prosperity, Illustrated	Office of the Governor, Lingayen, Pangasinan, 1977	
	17	Fishing Port Package I (Fishing Port Complex Preliminary Designs, Vol.I, II, III, IV, V, VI)	Dept. of Public Works, Trans. & Comm., Govt. of the Rep. of the Philippines	
14. Fisheries	1	Accomplishment Report	Sual/Dagupan	1976
	2	Accomplishment Report	-ditto-	1977
	3	Facts about Lingayen	Lingayen	1977
	4	Fisheries Report		1976
	5	List of Fish Processing Establishments		1977
	6	Pangasinan Report		1977
	7	Fisheries Statistics of the Philippines		1972 - 1975
	8	Table and Appendices (Fisheries Situation)		1970 - 1974

List of Data Collected, continued

KIND OF DATA	NO.	NAME OF DATA	PUBLISHER	REMARKS
14. Fisheries, continued	9	Annual Report (Natural Resources)		1977
	10	Philippine Fish Marketing & Distribution Study		1970
	11	Fisheries Data of Iloilo		1973 - 1977
	12	Fisheries Data of Zamboanga		1973 - 1977
	13	The Integrated Fisheries Development Plan	Fishery Industry Dev. Council	1977
15. Miscellaneous	1	Potential quantity and location of source in Lucena City	Lucena City	Tentative data
	2	Pangasinan, Planned Prosperity, Illustrated	Provincial Development Staff, Office of the Governor, Lingayen, Pangasinan	
	3	Creating the Phil. Fish Marketing Authority, Defining its Functions & Power, & for Other Purposes, Pres.Decree No.977	Government of the Philippines	
	4	Bicol River Control Project	Flood Control & Drainage Div., Bu. of Pub.Works	1972
	5	The remainder from the tributaries of Bicol River	Bu. of Public Works	
	6	Bicol River Basin	Bicol River Basin Council	1975, No.1 - No.5
	7	Facts about Lingayen	Mayor's Office, Lingayen	No. 0702
	8	Fish Mkt. News Bulletin	P F M A	Vol.1,No.243,1977
	9	Pres. Degreee No. 977	P F M A	
	10	Primer	P F M A	
	11	Tropical Cyclones	Climatological Div. Nagads, PAGASA	1975
	12	Pres. Degree No.704	Phil. Govt.	
	13	Phil. Fisheries Development Proj. Back-to-Office Rpt. of Fact-Finding Mis.	Asian Dev. Bank	Nov. 1977
	14	Computed Value for Wind Roses.	PAGASA EDP	Period 1951-1970

# # #

R E C O R D O F D I S C U S S I O N

MARCH, 1978

REVIEW AND COMPLEMENTARY STUDY

ON

THE FEASIBILITY STUDY REPORT, PACKAGE 1,

OF FISHING PORTS IN THE PHILIPPINES

THE RECORD OF DISCUSSION

INTRODUCTION

1. In response to the request of the Government of the Republic of the Philippines, the Government of Japan has decided to conduct a review and complementary study on the feasibility study report, prepared by the Government of the Philippines, in accordance with laws and regulations enforced in Japan.

2. Japan International Cooperation Agency (JICA), the official agency responsible for the implementation of technical cooperation programs of the Government of Japan, organized a review and complementary study team for the Feasibility Study Report, Package-I, on Fishing Ports in the Philippines (hereinafter referred to as the Japanese Team) comprising of seven(7) members who are experts in port engineering and fishery under the leadership of Mr. S. Hayashi, Former President, All Japan Fishing Port Association.

3. From February 20th 1978 to March 13th 1978, field investigation/inspection and complementary study was conducted by the Japanese Team at the project sites and at various offices of various Philippine authorities both in Manila and the provinces wherein the sites are located.

This study was completed in the Philippines on March 13th 1978 with the wholehearted cooperation of the Planning and Project Development Office, Department of Public Works, Transportation and Communications and other Philippine Government Agencies concerned, as well as related private organizations.

4. On February 22nd 1978, the Scope of Work in 30 copies and the Inception Report in 30 copies, were submitted to the Government of the Republic of the Philippines.

On March 16th 1978, the Progress Report in 30 copies were submitted to the Government of the Republic of the Philippines.

5. The general meeting with the Inter-Agency Technical Committee composed of National Economic and Development Authority (NEDA), Planning and Project Development Office-Department of Public Works, Transportation and Communications (PPDO-DPWTC), Department of Natural Resources (DNR), Philippine Fish Marketing Authority (PFMA), Bureau of Fisheries and Aquatic Resources (BFAR), Fishery Industry Development Council (FIDC), Food Terminal Inc. (FTI), and related authorities - was held on the 24th February 1978 to discuss the Scope of Work and Inception Report, both of which were submitted by the Japanese Team at DPWTC Conference Room, Quezon City.

6. The Second General Meeting was held on the 16th March 1978 with high officials and the technical staff of PPDO-DPWTC to discuss the Progress Report which was submitted by the Japanese Team at DPWTC Conference Room, Quezon City.

7. The Final General Meeting was held on the 17th March 1978 with members of the Inter-Agency Technical Committee and the Japanese Team, to present and discuss the team's conclusions and recommendations at NEDA Conference Room of the Presidential Management Staff Office of the President, Malacañang, Metro Manila.

8. For the purpose of explaining and clarifying of the Progress Report, we, the Planning and Project Development Office of the Department of Public Works, Transportation and Communications and the Japanese Team herewith agree to put on record the main issues of discussions carried out throughout the duration of the Japanese Mission in the Philippines.

MAIN ISSUES OF DISCUSSIONS

1. Basic Concept of Fishing Port Development

   (1) Basic concept of fishing port development program in the Philippines was agreed upon completely.

   (2) Several subjects and items, concerned with basic concept including technical, socio-economic and fishery aspect, were confirmed as indicated in the Progress Report.

2. Report

   (1) The Scope of Work was accepted officially and agreed upon completely by the Government of the Republic of the Philippines.

   (2) The Inception Report was accepted officially and agreed upon by the Government of the Republic of the Philippines, with some notations and suggestions as indicated in the Letter of Acceptance.

   (3) The Progress Report was accepted officially and agreed upon with clear understanding on the main issues of this report by the Government of the Republic of the Philippines, and also with some notations and suggestions as indicated in the Letter of Acceptance.

CONCLUSION

1. Mr. S. HAYASHI, Head of the Japanese Team expressed at the final general meeting to the high officials and their staffs of the National Economic and Development Authority (NEDA),

the Planning and Project Development Office (PPDO), Department of Public Works, Transportation and Communications (DPWTC), the Department of National Resources, the Philippine Fish Marketing Authority, the Bureau of Fisheries and Aquatic Resources, the Fishery Industry Development Council, and the Private Sector Fishermen's Association for their wholehearted cooperation extended to the Japanese Team by authorities of the Government of the Republic of the Philippines in Manila and in the regions visited by the Team.

His gratitude was also extended to all the people who had worked quietly for his Team behind the scene.

Finally, he expressed heartfelt appreciation to Director Pete N. Prado of PPDO, for his untiring support and to his staff for the enthusiastic cooperation given to the Japanese Team throughout the entire duration of their stay in the Philippines.

2. The Japanese Team implemented and completed all the study work, indicated in the Scope of Work and the Inception Report, and this is confirmed by both the Philippine Government Team and the Japanese Team.

3. The Head of the Philippine Team also expressed in behalf of the Republic of the Philippines his special thanks to all the members of the Japanese Team, especially to the Head of the Mission, Mr. S. HAYASHI for the exemplary diligence and efficiency in executing their tasks and their patience in bearing with the shortcomings of their

hosts. The Philippine Team further expressed their Government's deep appreciation to the Japanese Government for quickly responding to its urgent request for assistance to the Fishing Port Projects and for dispatching a mission composed of experts with unassailable competence and great experience.

PETE N. PRADO
Head, Project Preparation Team
Nationwide Fishing Ports Program
17 March 1978

SHINJI HAYASHI
Head of the Japanese
Mission

Republic of the Philippines
DEPARTMENT OF PUBLIC WORKS, TRANSPORTATION AND COMMUNICATIONS
NIA Building, E. de los Santos Ave., Quezon City
OFFICE of the SECRETARY

27 February 1978

Mr. Shinji Hayashi
Leader, Review and Complementary
Study of the Fishing Ports in the
Philippines
Japan International Cooperation Agency

S i r :

This is to acknowledge the receipt of thirty (30) copies of the Inception Report of the Review and Complementary Study on the Nationwide Fishing Port Project, Package I, in the Philippines. You may be pleased to know that the Philippine Government Team for this project agrees with the basic study concepts and principles set forth in the Inception Report as well as the program and schedule proposed for carrying out your Review and Complementary Study.

May we suggest, however, that in order to accelerate the implementation of the fishing port projects, your study team together with our team formulate the terms of reference for any required revisions, additional surveys, and possibly for the detailed engineering studies. This may minimize the usual gap between loan approval and the actual disbursement of proceeds therefrom for implementation.

We sincerely hope that your mission will be successfully completed. To this end, we are placing at your disposal our technical staff and necessary administrative support for the duration of your stay.

Very truly yours,

PETE NICOMEDES PRADO
Head, Fishing Port Project
Preparation Team

Noted:

TEODORO T. ENCARNACION
Assistant Secretary for Planning
and Administration, DPWTC

Republic of the Philippines
DEPARTMENT OF PUBLIC WORKS, TRANSPORTATION AND COMMUNICATIONS
NIA Building, E. de los Santos Ave., Quezon City
OFFICE of the SECRETARY

27 February 1978

Mr. Shinji Hayashi
Leader, Review and Complementary Study Mission
on Fishing Ports in the Philippines
Japan International Cooperation Agency (JICA)

Mr. Hayashi:

This is to acknowledge the receipt of thirty (30) copies of the Scope of Work of the Review and Complementary Study on Fishing Ports in the Philippines. The objectives and course of action outlined therein are fully acceptable to the Philippine Government.

We are also pleased to inform you that the Philippine Government is prepared to provide the necessary data and information you may need as well as finalize all arrangements for facilitating your work including the designation of counterpart staff who will be working closely with you.

With best wishes for the success of your mission on Fishing Ports Projects, which are of great importance to the Government of the Philippines.

Very truly yours,

PETE NICOMEDES PRADO
Head, Fishing Ports Project
Preparation Team

Noted:

Teodoro T. Encarnacion
TEODORO T. ENCARNACION
Assistant Secretary for Planning
and Administration
DPWTC

Republic of the Philippines
DEPARTMENT OF PUBLIC WORKS, TRANSPORTATION AND COMMUNICATIONS
NIA Building, E. de los Santos Ave., Quezon City
OFFICE of the SECRETARY

17 March 1978

Mr. Shinji Hayashi
Leader, Review and Complementary
Study of Fishing Ports in the
Philippines
Japan International Cooperation Agency

S i r :

We hereby acknowledge the receipt of thirty (30) copies of the Progress Report of the Review and Complementary Study Mission on the Nationwide Fishing Port Project, Package I, in the Philippines. In this connection, we wish to express our great pleasure and sincere appreciation for the expeditious accomplishment of your Mission's objectives.

We are particularly pleased to note that your findings confirmed the contents contained in the Feasibility Study Report prepared by the Philippine Government Team. We are also pleased to know that your conclusions and recommendations in terms of fisheries development requirements, port selection, projection of fishing vessels and fish landings, planned investment period, scale of investment, selection of construction materials and organizational improvement of fishing port operations are most favorable and constructive.

Most of all, we are most deeply gratified by your recommendation that the Fishing Port Complexes must be developed at the soonest possible time in view of the urgent needs for them. May we, however, suggest some qualifications to your statements in the following sections of your report:

(a) Section 5: Scale of Investment

Some elaboration on the methodology suggested for deriving the required length of mooring facilities should perhaps be appended to the report;

(b) Section 6: Selection of Construction Materials and their Place of Production

It is suggested that the recommendation to use steel sheet piles for quay walls be subjected

to a comparative cost analysis (vis-a-vis alternative materials such as R.C. piles)

With your continued support and concern, we look forward to a successful implementation of the Fishing Port Projects.

Very truly yours,

PETE NICOMEDES PRADO
Head, Fishing Port Project
Preparation Team

Noted:

TEODORO T. ENCARNACION
Assistant Secretary for Planning
and Administration, DPWTC

PLANNING
AND PROJECT
DEVELOPMENT OFFICE

DEPARTMENT OF PUBLIC WORKS, TRANSPORTATION & COMMUNICATIONS

21 March 1978

Japanese Fishery Port Mission
Sheraton Century Park
M a n i l a

Dear Sirs:

The weeks that passed have been a wonderful and fruitful experience for all of us. We hope that at some future date we might find time to renew our friendship even if it is in no way connected with the Planning and Project Development Office.

We thank you for everything.

Arigato.

Very truly yours,

MARITO GARICA	CRISPIN PANGAN	FEEDEZ CUNA
JUNE PALOMIQUE	ERIC ENCARNACION	POL DE GUZMAN
COL. LUANSING	ALFREDO TRONO	LUDOVICO BALDERIAN
LITO DE DIOS