

JAPAN INTERNATIONAL COOPERATION AGENCY  
MINISTRY OF NATURAL RESOURCES  
SOLOMON ISLANDS

No. 01

**BASIC DESIGN STUDY REPORT  
ON  
THE PROJECT FOR PROCUREMENT OF  
EQUIPMENT FOR IMPROVING CONTAINER  
HANDLING SYSTEM IN NORO  
IN  
SOLOMON ISLANDS**

**March 1993**

**D & A Engineering Co., Ltd., Tokyo**

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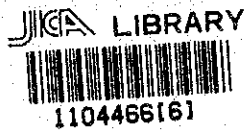


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**March 1993**

**D & A Engineering Co., Ltd., Tokyo**

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## PREFACE

In response to a request from the Government of Solomon Islands, the Government of Japan decided to conduct a basic design study on the Project for Procurement of Equipment for Improving Container Handling System in Noro and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Solomon Islands a study team headed by Mr. Tatsuo Saito, Special Advisor to the Minister of Agriculture, Forestry and Fisheries, on International Affairs (Fisheries), and constituted by members of D & A Engineering Co., Ltd., from November 11 to November 27, 1992.

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

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

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

March 1993



Kensuke Yanagiya

President

Japan International Cooperation Agency



Mr. Kensuke Yanagiya

March 1993

President

Japan International Cooperation Agency

Tokyo Japan

### Letter of Transmittal

We are pleased to submit to you the basic design study report on the Project for Procurement of Equipment for Improving Container Handling System in Noro, in Solomon Islands.

This study has been made by D & A Engineering Co.,Ltd., based on a contract with JICA, from November 5, 1992 to March 26, 1993.

Throughout the study, we have taken into full consideration of the present situation in Solomon Islands, and have planned the most appropriate project in the scheme of Japan's grant aid.

We wish to take this opportunity to express our sincere gratitude to the officials concerned of JICA, the Ministry of Foreign Affairs, the Ministry of Agriculture, Forestry and Fisheries, the Fisheries Agency. We also wish to express our deep gratitude to the officials concerned of the Ministry of Natural Resources, the Solomon Islands Port Authority, the Embassy of Japan in Solomon Islands and the JOCV Solomon Islands Office for their close cooperation and assistance during our study.

At last, we hope that this report will be effectively used for the promotion of the project.

Very truly yours,



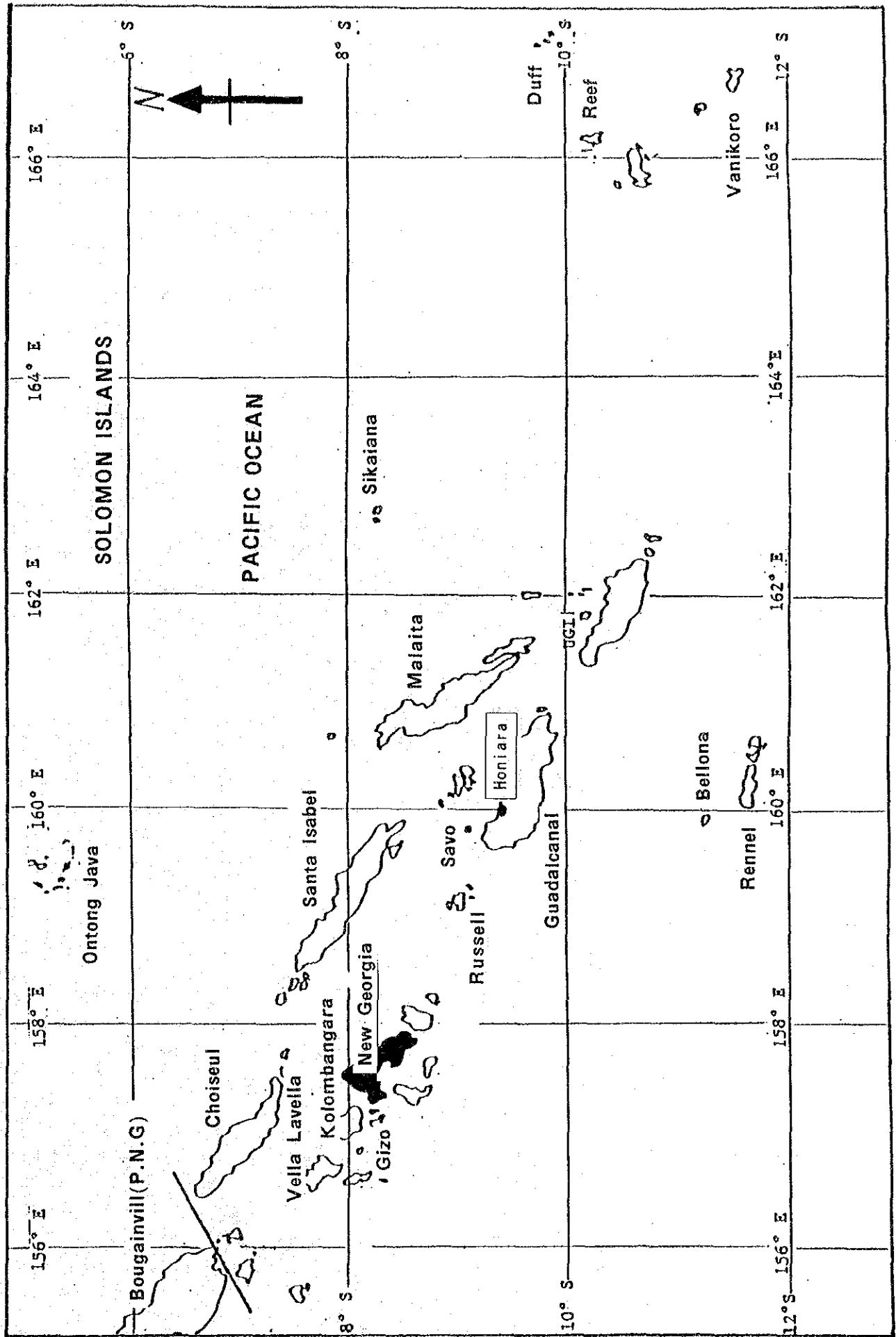
Project Manager, Mamoru Kondo

Basic design study team on  
the Project for Procurement of  
Equipment for Improving Container  
Handling System at Noro

D & A Engineering Co.,Ltd.



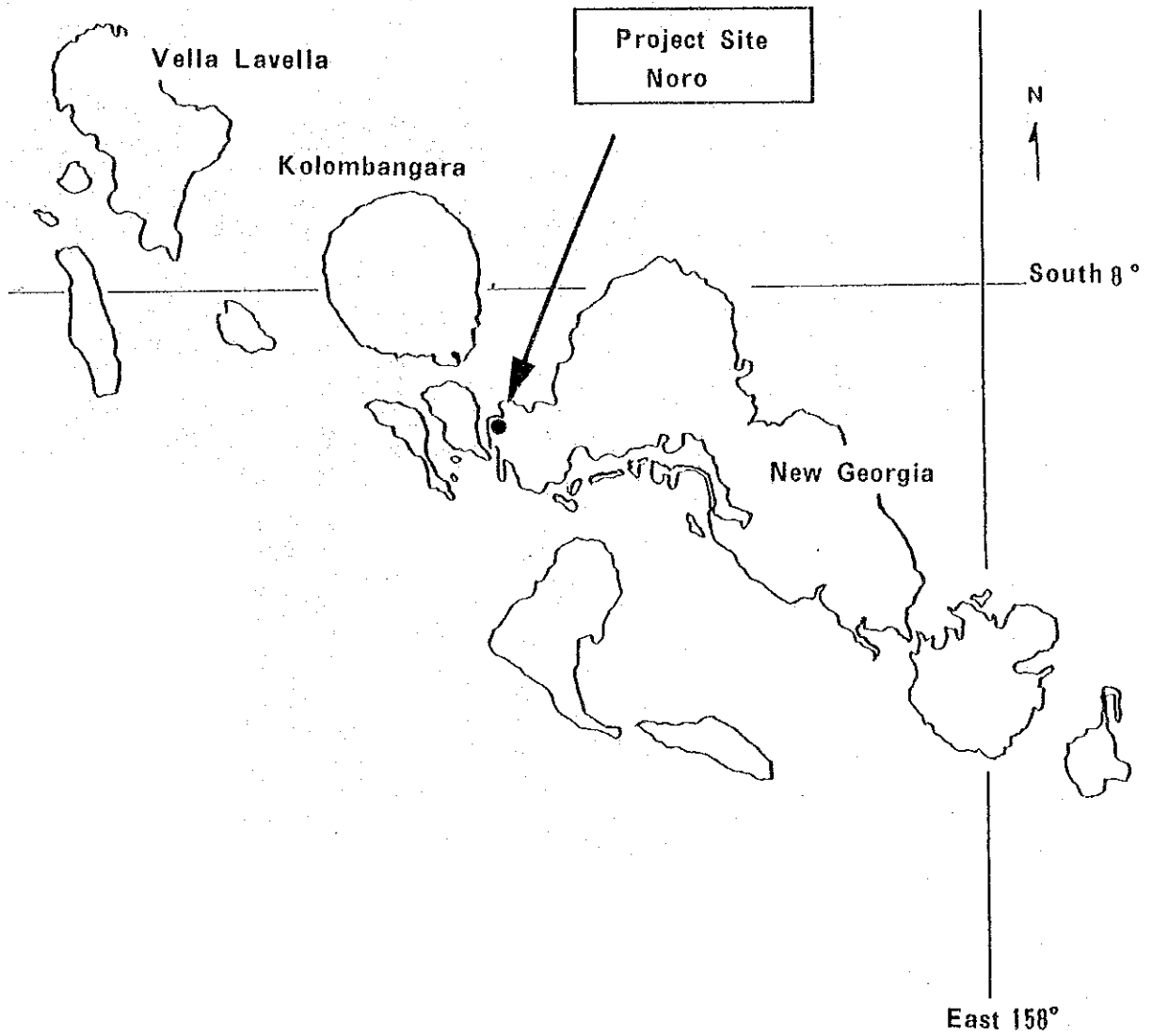




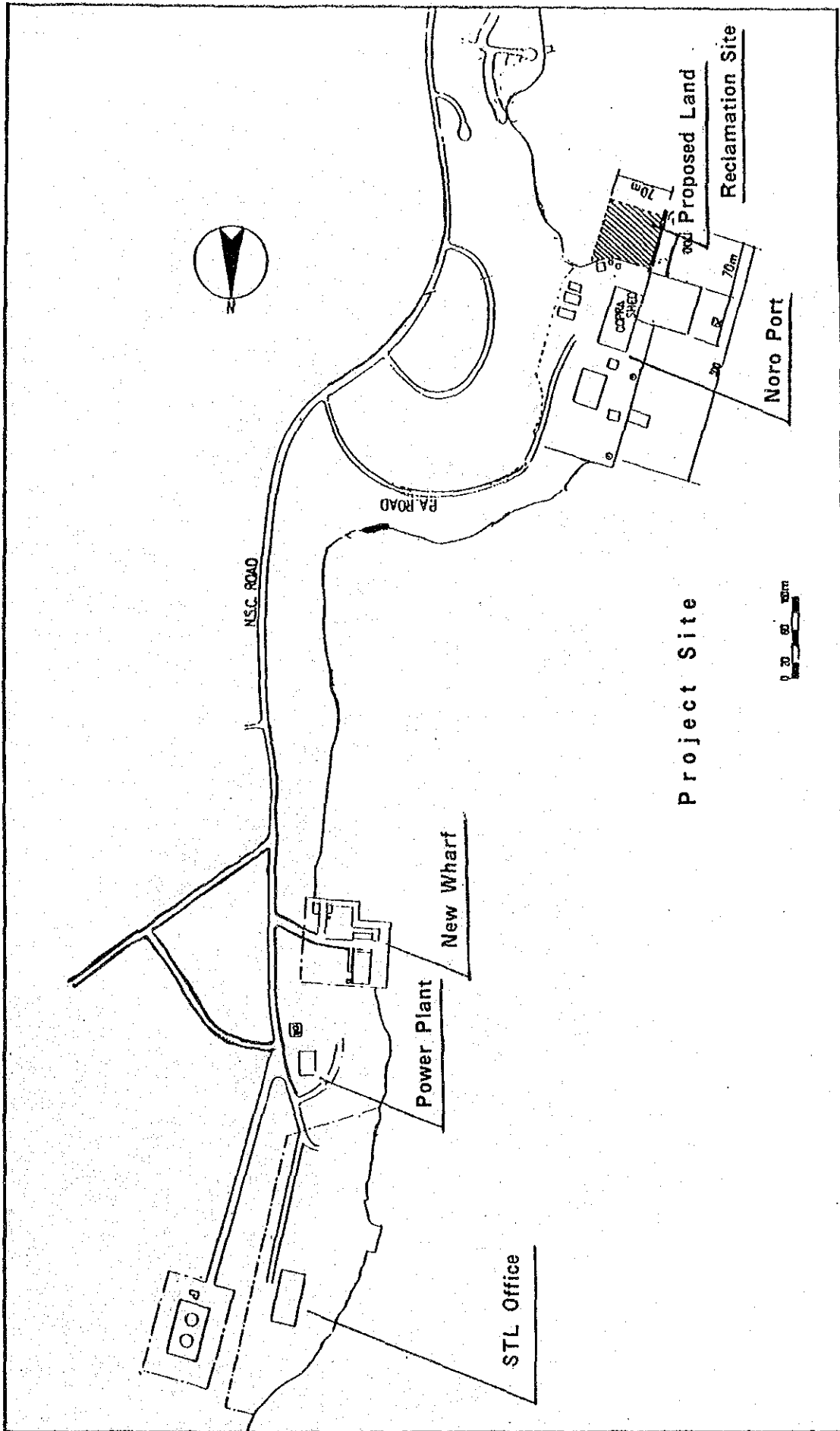


PROJECT SITE

NEW GEORGIA









## SUMMARY





## S u m m a r y

Located between 154 deg. and 162 deg. E. longitude, and between 5 and 12 deg. S. latitude, Solomon Islands is an archipelagic nation with a land area of about 270 thousand km<sup>2</sup>, and a total population of about 320 thousand. Major economic activities consist of agriculture and fisheries, which account for about 60 to 70% of GDP. Solomon Islands operates a dual economy; the monetary economy in Honiara, the capital, and other provincial towns and the subsistence economy at the rural community level. On planning any development programs, therefore, earning and living standard differentials between two sectors must always be taken into consideration. To abolish these differentials and also control the drift of population to cities, efforts are being made to develop the rural economy by the Government of Solomon Islands, one of which is a provincial development project being carried out in Noro, New Georgia Island, Western Province.

Some gaps, however, have taken place in developing process between the rural development and fisheries development. The lack of efficient container handling facilities in Noro is an example of such a gap. Since the fisheries development including processing was ahead of the cargo handling development, increasing containers are not handled properly here.

Under these situations, to promote well-matched development both in the rural sector and fisheries sector, the Government of Solomon Islands formulated a project to improve the container handling system in Noro as part of the fisheries development, and requested the Government of Japan to offer a grant aid on the procurement of equipment and materials necessary for the project.

The Government of Japan, responding to the request, decided to conduct a basic design study on the project, and Japan International Cooperation Agency (JICA) sent a Basic Design Study Team to Solomon Islands for a period between November 11 and 27, 1992. The Team had a series of discussions about the project with the Solomon officials concerned, carried out necessary site surveys including collecting data and materials. Based on the analysis of the results of surveys in Japan the Team prepared the present Basic Design Study Report.

The original request by the Solomon side consisted of the equipment for loading/unloading containers and the equipment for creating/maintaining container yard. As a result of the survey the Team recognized the necessity

and urgency of the former due to the current container handling situation, but concluded that the supply of the latter be suspended until an integral development plan of Noro port, including land reclamation of the foreshore, with a full approval of the environmental authorities concerned is finalized.

The equipment and materials covered by the project therefore are as follows;

Equipment for loading/unloading containers

(1) 28 ton forklift 1 unit

(2) Self-loading/unloading trailer tractor 1 unit

The Ministry responsible for promoting and coordinating the project is the Ministry of Natural Resources, and the agency responsible for operating the equipment when it is supplied is Solomon Islands Ports Authority (SIPA), in consultation with the Fisheries Division of the Ministry of Natural Resources.

It is estimated that the work of the project will take 10 months to complete; the detail design requires 2.5 months, the preparation, manufacturing, and procurement in Japan 6 months, and the transportation 1.5 months.

The implementation of the project will improve the efficiency and reliability of the container handling system in Noro through an utilization of supplied equipment and materials. Furthermore it is expected that the fisheries development and the community improvement in Noro are achieved through an export increase of fishing products and local products exports as well as an import increase of necessary resources. Finally, in order to enhance the utilization and effect of the equipment supplied under the project, it is of importance that the cooperation concerning the equipment and materials requested but excluded from the project should be promoted.

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# CHAPTER 1

## INTRODUCTION



## Chapter 1 Introduction

The fisheries sector in Solomon Islands can be divided into two subsectors; the traditional artisanal inshore fishery and the commercial tuna fishery. The latter is one of important industries in the country, with catches in excess of 40,000 tons and exports accounting for about 40% of the total exports annually. The fisheries sector has been given top priority in development. In the Programme of Action 1989-1993 announced in 1989 the development of fisheries which is a mainstay of the industries of the country is listed as one of the major aims to contribute to the national economy.

The Government of Solomon Islands, striving for the rural development to abolish economic differentials between urban and rural areas, selected Noro, New Georgia Island, as a development base in the Western Province, formulated a project to improve the container handling system here, and requested the Government of Japan to offer a grant aid the procurement of equipment and materials necessary for the project.

On the request the Government of Japan decided to conduct a basic design study on the project and Japan International Cooperation Agency (JICA) sent a basic design study team headed by Mr Tatsuo Saito, Special Advisor to the Minister of Agriculture, Forestry and Fisheries, on International Affairs (Fisheries), to Solomon Islands for a period between November 11 and 27, 1992. The team discussed the details of the request with Solomon Islands officials concerned, examined the urgency and appropriateness of the project, previous foreign assistance, implementation arrangements of the project and so forth, collected materials available, and carried out a field survey including fisheries conditions and related conditions.

Major points of the mutual agreement resulted from discussions with the Solomon Islands side were confirmed on the "Minutes of Discussions, Basic Design Study on the Project for Procurement of Equipment for Improving Container Handling System in Noro in Solomon Islands" signed mutually. And then, based on the analysis and review of the results of the field survey, the Team assessed the effect of the project in developing the Solomon Islands fisheries, conducted a basic design on the equipment for loading/unloading containers necessary to improve the container handling system in Noro and established the most suitable scale and contents of the equipment above.

The present report covers the basic design, implementation schedule, recommendations and so forth that are judged the most suitable for the implementation of the project.

The Members List of the Study Team, Study Itinerary, List of Persons concerned, and the Minutes of Discussions are shown in Appendix.



## CHAPTER 2

### OUTLINE OF THE REQUEST



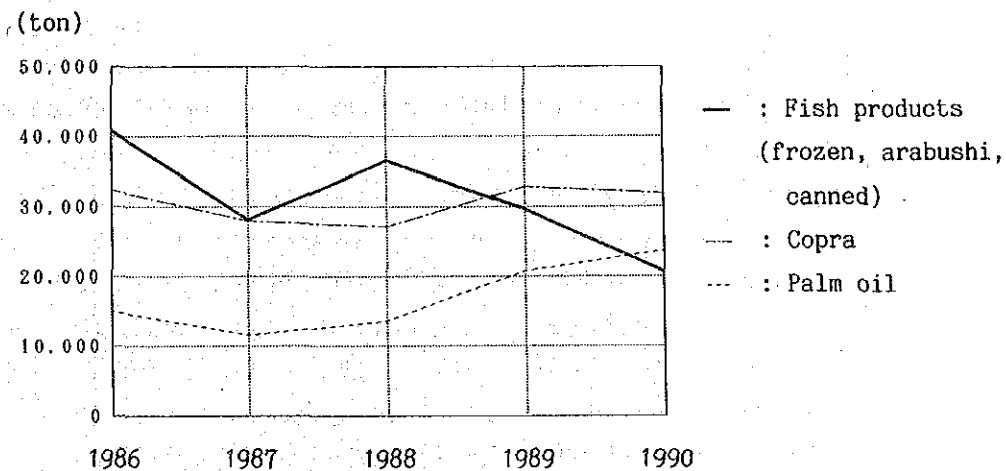
## Chapter 2 Outline of the Request

### 2-1 Background of the Request

#### (1) Outline of Solomon Islands

Solomon Islands, located between 154 ° E and 162 ° E and between 5 ° S and 12° S., is an archipelagic nation with a land area of 27,556km<sup>2</sup>, the largest one next to Papua New Guinea in the South Pacific. Its total population is estimated at about 320 thousand in 1992, of which about 40 thousand are living in and around Honiara, the capital of the country.

Agriculture including forestry and fishery is a mainstay of the economy of the country, accounting for about 60 to 70% of its GDP. Major products are copra, palm oil, and cocoa in agriculture, timber in forestry, and frozen, canned, or smoked fish in fishery. Figure-1 shows the evolution of major exports from 1986 to 1990.



(Source: Solomon Islands Central Bank; September 1991)

Figure-1 Major Exports (1986-1990)

#### (2) Overview of Fisheries

The fisheries sector can be divided into two subsectors; the traditional small scale fishery at the self-sufficient level and the commercial tuna fishery that is the country's main export earner. The former is actually a subsistence

fishery operated within 3 nautical miles covered with the traditional fishing right off remote areas with undeveloped transportation and communication. The typical artisanal fishing boat is a small dugout canoes, equipped occasionally with an outrigger, but fishermen of towns began using modern FRP boats with outboard motors. A small variety of fishing gear is employed, mainly trolling, small seines, bottom gill nets, hand lines, spearfishing.

Catches of the commercial fishery reach about 40,000 tons per year, the greatest in the South Pacific countries. Fish exports in the form of frozen, canned, or smoke-dried (arabushi) are shown in Table-1. The year of 1990 saw a reduction by half of frozen fish exports comparing with 1988 due to the completion of additional facilities of the cannery and arabushi factory plus poor fishing. Canned products with higher value added are increasingly produced recently due to a sluggish price of frozen tuna, contributing about 40% of total exports for this 5 years. The cannery in Solomon Islands is playing a key role in the country's economy. In particular, the fishery in Noro is greatly contributing to the rural development of Noro with increasing both employment opportunity and cash incomes.

**Table-1 Fish products exports** (1986-1990) (ton)

Item	1986	1987	1988	1989	1990
Frozen fish	39,565	26,629	35,006	27,941	17,324
Arabushi	226	313	313	410	520
Canned fish	1,040	1,200	1,205	1,284	2,793
Total	40,831	28,142	36,524	29,635	20,637

(Source: Solomon Islands Trade Directory 1992)

Catches by artisanal fishermen are bought out by provincial fishing centers and sold to meet local requirements, and then shipped to Honiara. Each local consumption is about 70 tons per year and supply to Honiara is about 10 tons,

which are distributed through the Fisheries Division. In Honiara another supply of about 430 tons of frozen tuna is provided by the industrial fishery. Fish from each fishing center are packed in insulated fish containers with ice, sold at the Honiara municipal market and on the roadsides as well. There seems fresh fish distribution not through fishing centers. Fresh fish, as the most important protein source, are much in demand as well as domestic canned products produced in the cannery at Noro, the project site.

### (3) National Development Plan

The Government of Solomon Islands has given higher priority to the fisheries sector in the Third National Development Plan 1985-1989. In the Programme of Action 1989-1993, the following aims of the fisheries development policy are emphasised so that the fishery can contribute to the national economy.

- Achievement of self-sufficiency in the supply of fish to the domestic market.
- Improvement of cash incomes throughout the fisheries sector.
- Increasing fishing and fisheries related employment in the Provinces.
- Promoting participation of more local people in the commercial fishery and related industries.
- Increasing foreign-exchange earnings.

Efforts has been made by the Government to abolish the following that the Government regarded as impediments in the country's fisheries development.

- Vulnerability of inshore fishing resources in overfishing.
- Lack of the fishermen's will to fish.
- Limited fish marketing facilities throughout the country.
- Inadequate infrastructure in transportation on both land and sea.
- Lack of technical and managerial skills.
- Lack of proper fishing boats and fishing gear.
- Existence of rigid traditional fishing rights.

The Government of Solomon Islands placed an emphasis on the rural development, and selected Noro of New Georgia Island as a key point in the Western Province development. This project for procurement of equipment for improving container handling system in Noro is part of an integrated plan to improve harbor facilities in Noro, and is to be a hub of the plan. It is needless to say that the rural development should be carried forward keeping the balance between various sectors. However, in Noro, the cannery was extended despite an

inadequate cargo handling system, which can not now deal with increasing containers. To improve such a situation the Government requested the Government of Japan to offer a grant aid on the procurement of equipment necessary for the project.

## 2-2 Objective and Contents of the Request

### (1) Outline of the Request

In line with the National Development Plan the Government of Solomon Islands formulated an integrated rural development programme aiming at fostering local industries and creating employment opportunities to control a influx of people into the capital. Under the assistance of Japan as well as EC the Government has developed the international port facilities, fishing port facilities, fish processing facilities, and so forth in Noro in Western Province. The fishing and processing, key industries in Noro, have been brought up considerably, with the exports increasing. In Noro both exports and imports are all handled in containers. Though there is no problem in shipment of the container cargoes by container vessels from Noro, however, the container handling system in Noro remains unchanged, the space of the container yard reaches a limit, resulting in the serious difficulty handling containers. On the other hand, the output of about 500,000 cases in 1991 from the cannery is expected to be increased to 800,000 in a few years and finally to 1,100,000 cases per year. The handling volume of containers of canned products alone will accordingly increase to about 1,200 TEU soon from 672 TEU in 1990. From the standpoint of the support to the key industries of fishing and fish processing in Noro, it is becoming an urgent problem for the Government to improve the existing container handling method.

Hence, in order to save the current situation, the Government of Solomon Islands requested the Government of Japan to offer a grant aid on the procurement of necessary equipment to ensure efficient and reliable handling of materials and products.

The equipment requested by the Government are as follows;

① Equipment for loading/unloading containers

(a) 28 ton forklift 1 unit

Fork length: approx. 2,200 mm

- (b) Self-loading/unloading trailer tractor 1 unit  
Capacity of sidelifter: 24 ton
- ② Equipment for creating/maintaining container yard
- (a) Bulldozer 1 unit  
Operating weight: 24 ton  
Blade capacity: 4.7 m<sup>3</sup>  
Blade length: approx. 3,700 mm
- (b) Backhoe (hydraulic excavator) with breaker 1 unit  
Bucket capacity: 0.63m<sup>3</sup>  
Operating weight: 15 ton  
Breaker force: point chisel, 705 kg
- (c) Tractor shovel (wheel loader) 1 unit  
Bucket capacity: 2.1 m<sup>3</sup>  
Operating weight: 10 ton  
Breakout force: 12.5 ton
- (d) Tipper trucks 3 unit  
Loading capacity: 8 ton
- (e) Compactor (vibratory roller) 1 unit  
Operating weight: 9.6 ton  
Centrifugal force: 20 ton  
Compacting width: approx. 2,100 mm
- (f) Road grader 1 unit  
Operating weight: 9 ton  
Blade length: approx. 3,100 mm

(2) Expected Benefits

The expected benefits from a supply of the requested equipment are as follows;

① Equipment for loading/unloading containers

(a) 28 ton forklift

At present, there are only 2 units of 6 ton forklift plus 2 units of arbilift; a pair of each lift is handling container between the wharf and the container yard. This work requires at least 3 workers; one driver of the forklift, one assistant for hooking/unhooking the hanging hooks of the arbilift, plus one supervisor, taking about 10 minutes for one container.

The capacity of the forklift, however, is only 6 tons, so, except for an empty container the forklift alone can not deal with a loaded container, let alone stacking it. Consequently, the containers are placed on the ground without stacking, limiting the number of them possible to be placed in the container yard.

The introduction of 28 ton forklift makes it possible to stack containers in three stacks for loaded conditions and in five stacks for empty containers, resulting in efficient usage of the container yard with increasing number of containers.

(b) Self-loading/unloading trailer tractor

At present, the outputs of the cannery are first loaded on trucks at the cannery, and carried to the wharf, at which they are transferred to the containers after offloading. During these three transshipments, all manual work, the canned products are prone to receive such damages as dents. In addition, these operation are subject to weather conditions and thus it is difficult to ship the canned products under bad weather. Production materials at the cannery as well as general cargoes are imported in containers, and they also require the same transshipment operation between containers and trucks at the wharf before proceeding to each destination. When this type of trailer tractor is introduced the transshipment operation become unnecessary. Furthermore the shipment of canned products become free from weather conditions; the product loss rate can be minimized; the time and labor required for container handling are reduced; the safety in work operations is substantially improved.

② Equipment for creating/maintaining container yard

At present, the port facilities in Noro are utilized to export copra and marine products including canned provisions, and import materials for cannery operation and daily necessities for people living in and around Noro. Almost all commodities except for copra are transported in containers. Both exports from and imports to Noro are drastically increasing, and thus the number of containers to be handled exceeds the capacity of the system. The extension of the container yard is therefore urgently required to improve efficiency in handling of containers, together with the introduction of the container handling equipment.

The introduction of such construction machinery as a bulldozer, backhoe,



etc. would make it possible to extend and create the container yard, including land reclamation, leveling of ground, and pavement, without receiving assistance from Gizo, the provincial capital. Creation of the container yard, when pavement is completed, would make it possible to place containers in three stacks for loaded conditions and in multistacks for empty containers, which will simplify the control of containers and reduce container turn-around time.

### (3) Implementation arrangements

The Ministry responsible for the project is the Ministry of Natural Resources, and the agency responsible for operating the equipment when it is supplied is Solomon Island Ports Authority (SIPA), in consultation with the Fisheries Division of the Ministry of Natural Resources. The Ministry of Natural Resources has already experienced in executing the Japan's grant aid and can give SIPA advice and guidance. SIPA is a statutory body of the Ministry of Commerce and Primary Industries. The body is responsible for the country's two international trade ports of Honiara and Noro, and as a statutory body receiving the port charges and cargo handling fee in these two ports as a major revenue, is keeping sound financial practice in recording a net surplus each year.



## CHAPTER 3

### OUTLINE OF THE PROJECT



## Chapter 3 Outline of the Project

### 3-1 Basic Policy of the Project

The Basic Design Study Team had a series of discussions about the background, content, scale, and implementation arrangements of the request with the Solomon Islands officials concerned, carried out necessary field surveys, and studied and examined the necessity and appropriateness as a Japan's grant aid project. As the result the Team concluded to deal with the project in line with the following basic policy.

- (1) The development of fishing and fish processing industries is essential to develop Solomon Islands.
- (2) From the viewpoint of the country's speciality (many dispersing small islands, islets, and lagoons; a dual economy between towns and rural areas, and so forth), Noro, the project site, is very important as a key district to develop Western Province. On the other hand, in Noro, being surrounded with a very beautiful natural environment, it is reasonable that such a project including land reclamation should be implemented under full agreement between Ministries and authorities concerned.
- (3) The Noro fisheries including fishing and canning are now highly developed, and the existing cargo system can not meet an increasing container handling requirements. It is an urgent problem to ensure efficient handling materials and products for the cannery.
- (4) Based on the above the necessity and feasibility of the request were fully understood, However, the supply of the equipment for creating container yard should be suspended until an integral and concrete plan for the development of port facilities in Noro is finalized.

### 3-2 Agreement Resulted from Discussions

Table-2 shows the mutual agreement resulted from discussions about the original request from the Solomon side.

Table-2 Request and Agreement

	Request	Agreement
1	Equipment for loading/unloading containers  (a) 28 ton forklift 1 unit  (b) Self-loading/unloading trailer tractor 1 unit	Agreed as requested  For handling ISO 20 ft container. Standard three stacks type.  Grade ability must be taken into consideration.
2	Equipment for creating/maintaining container yard  (a) Bulldozer 1 unit (b) Backhoe 1 unit (c) Tractor shovel 1 unit (d) Tipper truck 3 unit (e) Compactor 1 unit (f) Road girder 1 unit	Not be included in the present project.

### 3-3 Project Target Area and Project Site

#### (1) Project target area

The project target area is Noro district of New Georgia Island, Western Province. Its overview is as follows;

Location	New Georgia Island, Western Province
Population	approx. 2,000
Land area	0.0242 km <sup>2</sup>
Distance from Honiara	approx. 300km

Note: The flight from Honiara to Munda airport, New Georgia Island, takes about one hour and half, and another half hour drive to the project site.

Noro district is a key station of rural development in the Western Province, with fishery related facilities, fish processing facilities, and port facilities. Also Noro port is designated as international trade port, supporting the fisheries, a mainstay of the economy of Noro, with fish product exporting and materials for the cannery importing.

Fish production here is conducted by Solomon Taiyo Ltd (STL: a company jointly owned by the Government (51%) and Japanese interests) with 21 pole-and-line fishing boats plus 3 purse seining units operating for 9 months (March to November) during the year. Production was about 23,000 tons in 1989 and about 18,000 tons in 1990. Another commercial fishing company National Fisheries Development (NFD) has a plan to move from its base Tulagi. About 60% of the catches is processed for canned products and arabushi, and remnants in canning process are utilized for fishmeal production, some 750 tons of fishmeal per year. The maximum production capacity of the cannery is 700,000 cases for exports and 350,000 cases for the domestic market, but presently the outputs are about 450,000 cases and 200,000 cases respectively, 64% and 57% of the maximum capacity.

The cargo handling facilities in Noro were originally prepared for copra, and so can not meet increasing container requirements.

## (2) Project site

The project site is located at Noro district. Its overview is as follows;

### ① Noro port area

In Noro port area the STL fishing base was constructed in 1976. It includes a 100 m wharf, a 600 ton cold storage facility, a 100 t/12 hr freezing room, a 15 t/day ice plant, 4 generators of 450 KVA, a 750 kℓ oil tank. In 1978 a road between Noro and Munda was constructed and in 1980 a STL arabushi factory, in 1981 port facilities for copra exports were completed respectively. Also an integral infrastructure development project was implemented in 1989, including port facilities with a 62 m long 20 m deep wharf, roads, waterworks, sewerage, housing (60 units), telephone, a STL

cannery, an additional STL arabushi factory. And in 1990 an oil reserving system including two 3,000kℓ oil tanks, a 2.5 km pipe line and a control building. The road (1.5 km) between Noro port and STL however is not yet paved, steep slopes disturb a traffic between the port area and the trunk road, which arrest the spread of development effects. Efforts toward the infrastructure development are now required.

② Proposed container yard

The proposed container yard with an area of about 5,000m<sup>2</sup> (about 70×70 m) is expected in the south of Noro port. The west side of it is comparatively favorable for land reclamation because of a breakwater extended to the mooring bitt on the new wharf. Since the proposed site is completely within the Noro port area, there is no restriction on reclamation in principle, but it is essential to reach a full agreement between all authorities concerned including environmental authorities on a detailed implementation plan. For instance, despite an international trading port, Noro has no customs and quarantine office. The implementation plan therefore need to include not only reclamation but also necessary shore facilities. This task is now under way and SIPA is coordinating authorities concerned. Hence the Team concluded that the provision of the equipment for creating container yard be suspended until an integral development plan of Noro port is finalized.

### 3-4 Outline of Implementation Arrangements

The Ministry responsible for the project is the Ministry of Natural Resources, and the agency responsible for operating the equipment when it is supplied is Solomon Island Ports Authority (SIPA), in consultation with the Fisheries Division of the Ministry of Natural Resources.

The Fisheries Division consists of three sections, taking charge of the provincial development and extention services, training, and licensing, statistics, marketing, etc. respectively, and is responsible for the development of the country's fisheries resources. SIPA is a national corporation responsible for the country's two international trade ports of Honiara and Noro, belonging to the Ministry of Trade, Commerce and Industries. The outline of these two agencies is as follows;



(a) Fisheries Division

Personnel 36

Budget SI\$718,220 in 1990

Authorities and duties: Responsible for the development of the country's fisheries resources.

(b) Solomon Islands Ports Authority (SIPA)

Personnel 190 (of which 16 are allotted in Noro)

Budget Revenue SI\$6,150,935 in 1991

Expenditure SI\$5,334,741 in 1991

Authorities and duties: Responsible for the country's two international trade ports of Honiara and Noro in operation and maintenance of port facilities, incoming and outgoing vessels, cargo handling, cargo keeping, and so forth.



## CHAPTER 4

### BASIC DESIGN OF THE EQUIPMENT



## Chapter 4 Basic Design of the Equipment

### 4-1 Study and Examination of the Equipment

#### (1) Design Criteria

The selection and determination of the equipment are to be conducted based on the results of the field survey on the current situation of the fisheries and fisheries related industries, Solomon Islands' technological level, the purpose and operating conditions of the equipment. At the same time, the particular of each equipment, necessity of accessories and spare parts, handling easiness, technical assistance to SIPA from the contractor, after-sale service, and so forth were taken into consideration to select the most suitable equipment. All spare parts are to be delivered at the site together with the equipment proper.

Separately delivered parts are to be assembled and test-operated at the site before the delivery by the contractor who will give guidance in operation, maintenance, and inspection of the equipment.

#### (2) Study and Examination of the Specifications

- Equipment for loading/unloading containers

The weight of the container presently being handled in Noro port is about 20 tons, the container's weight of about 2 tons plus cargoes of about 18 tons, and, except for copra, almost all the cargoes including canned products are handled in 20 ft type containers. The forklift to be provided therefore is to be the type capable of handling ISO 20 ft container. At present the maintenance of the equipment for loading/unloading containers in Noro is given by SIPA engineers despatched there from Honiara SIPA headquarters which procures necessary spare parts from abroad. SIPA engineers are adequately skilled in the hydraulic machinery as well as diesel engines so that the equipment can be properly maintained.

#### (a) 28 ton forklift

The existing equipment for loading/unloading container in Noro is incapable of stacking containers. The supply of the requested equipment improves greatly the utilization of the existing container yard by stacking containers, two stacks will handle the same number of containers handled presently in a

half area of the current container yard. The forklift to be supplied is to be used in only Noro port premises, and, taking necessary passages into consideration, a new container stocking plan after the requested forklift is supplied are given in Appendix II - ③.

(b) *Self-loading/unloading trailer tractor*

This equipment is for self-loading/unloading container and makes it possible to carry a container without a forklift. At present there is not this equipment in Noro, and thus the containers unloaded from container vessels are carried to the container yard, where the cargoes in the containers are transferred to trucks. The supply of the requested equipment makes it possible to deliver directly containers with cargoes to each destination. The cargoes to be handled with the requested equipment include the canned products, materials for the cannery, daily necessities and so forth, and the destinations are the cannery, Noro town, Munda town and others.

At present, there are three units of this equipment in Honiara, operating for carrying general goods including grain. This equipment is to be procured from Steel Bros Ltd., New Zealand, which provided those in Honiara.

#### 4-2 Specifications

(1) Basic requirements

- ① (a) The equipment shall be durable for the natural conditions of the Solomon Islands waterfront; a temperature of 22 to 32°C and humidity of 40 to 80%.
  - (b) All the equipment shall be in accordance with the existing Solomon Islands regulations.
  - (c) All the equipment shall be manufactured in accordance with the specifications
- ② Provide the service manuals and others as follows;
- |                         |                             |
|-------------------------|-----------------------------|
| (a) Service manuals     | 3 copies for each equipment |
| (b) Maintenance manuals | 3 copies for each equipment |
| (c) Parts catalog       | 2 copies for each equipment |
| (d) Tools list          | 1 copy for each equipment   |
- ③ Spare parts

Spare parts shall be designated among the spare parts list submitted by the contractor. All the spare parts shall be delivered together with the equipment proper.

④ Guarantee

The term of guarantee of each equipment shall be at least one year after delivery.

(2) Outline to the Specifications

• Equipment for loading/unloading containers

(a) Forklift 1 unit

Engine Diesel direct injection type 200 HP over  
Max rated capacity 28 tons  
Max lift height 6 m over  
Mast tilt angle 6 degree fwd/ 12 degree aftwd  
Fork length 1,600 mm over  
Spare parts Equivalent to 10% of the FOB-Japan price of the equipment, including packings of hydraulic parts, tires, oil filters, etc.

(b) Self-loading/unloading trailer tractor

Truck Truck for trailing  
with water cooling diesel engine, approx. 300 HP  
right side wheeling, 2 wheels fwd/ 8 wheels aftwd  
Fuel tank: 400 ℓ  
Headlight: Changeable for high-beam and low-beam  
Brake: Fwd and aftwd wheels, drum (air) brake and exhaust brake.

Trailer Trailer for ISO 20 ft container

Engine for hydraulic motor: approx 30 KW  
Arms for loading/unloading container: 2 units  
Max capacity: 30 tons  
Max lift height: 4 m

Spare parts Equivalent to 10% of the FOB-Japan price of the equipment, including 10 tires, brake shoes, oil filters, air filters, etc.

#### 4-3 Implementation Arrangements of the Project and the Scope of Work

##### (1) Implementation arrangements

The request for grant aid to the project was initiated by the Ministry of Foreign Affairs and Trade Relations after a domestic coordination by the Bilateral Aid Planning Division of the Ministry of Provincial Government. The Ministry responsible for operating the equipment when it is supplied is Solomon Island Ports Authority (SIPA), in consultation with the Fisheries Division of the Ministry of Natural Resources.

The Ministry of Natural Resources is to govern the aid money (arrangements of procedure concerning the Banking Agreement and the Authorization to Pay, receipt of the granted project, issuance of necessary certificates, and so forth), and then the equipment is to be delivered to SIPA. On the delivery, a Memorandum of Understanding (MOU) to ensure a proper management and operation of the equipment of the project is to be concluded between the Ministry and SIPA.

##### (2) Implementation agency

SIPA is to operate the equipment of the project in accordance with the MOU. The equipment is to be operated within the range of SIPA's budget, and the fisheries in Noro is to be given priority in handling their outputs and inputs in close liaison with the Fisheries Division.

##### ① Staffing plan

At present 16 persons of SIPA are stationed at Noro, of which one is a supervisor, 3 are forklift operators, and other 3 are cargo handling workers. These 7 staffs are to be in charge of operating the equipment of the project. Furthermore the chief engineer in Honiara headquarters of SIPA is to be in charge of maintenance of the equipment. Presently 23 engineers are working under the chief engineer, of which one engineer is stationed at Noro.

##### ② Estimate of balance

###### (a) Revenue

- Forklift handling charge is SI\$260 per hour. Assuming that container handling is 2 rounds per month and working hours are 8 hours a day,



operating ours per year are 2 rounds/month  $\times$  12 months  $\times$  8 h/round = 192 h/year.

Hence the revenue generated by the forklift is

$$\text{SI\$}260/\text{h} \times 192\text{h} = \text{SI\$}49,920$$

- Trailer tractor charge is SI\$250 per hour. Assuming that container handling is 1 round per month and the tractor is utilized one hour a day, total utilization hours are 1 round/month  $\times$  300 days  $\times$  1 h/round = 300 h/year.

Hence the revenue generated by the trailer tractor is

$$\text{SI\$}250/\text{h} \times 300\text{h} = \text{SI\$}75,000$$

(b) Expenditure

- Assuming that the forklift fuel consumption per hour is 13.5  $\ell$ , the trailer tractor fuel consumption per hour is 13.5  $\ell$ , the fuel is SI\$1.20/ $\ell$ , and the forklift works for additional 150 hours a year in the container yard, total fuel expenses are

$$\text{Forklift: } \text{SI\$}1.20/\ell \times 13.5 \ell/\text{h} \times (192 \text{ h} + 150 \text{ h}) = \text{SI\$ } 5,540.4$$

$$\text{T/Tractor: } \text{SI\$}1.20/\ell \times 13.5 \ell/\text{h} \times 300 \text{ h} = \text{SI\$ } 4,860.0$$

$$\text{Total} \quad \quad \quad \text{SI\$}10,400.4$$

- And the maintenance costs including tyres, oil, and expendables are estimated at 2.18 million yen per year, that is SI\$51,782.

In total the estimate balance of the equipment is shown in the table below.

**Table-3 Estimate of Yearly Balance**

(unit: Solomon Dollar)

Revenue		Expenditure	
Handling charge		• Fuel expenses	10,400
• 28 ton Forklift	49,920	• Maintenance	51,782
• Trailer tractor	75,000		
Total	124,920	Total	62,182

(3) Scope of work

Major undertakings to be taken by each Government are as follows;

① The following are covered by grant aid

- Procurement of all necessary equipment and materials for the project and provision of sea and land transportation for the equipment and materials to the project site, including the payment of transportation insurance.
- Assistance in the preparation of the detail design and tendering, and consultancy on controlling the project.

② Responsibilities of the Solomon Islands side

- Maintenance of a land for stocking the equipment and materials of the project.
- Prompt unloading, tax exemption, and customs clearance of the equipment and materials of the project at the port of disembarkation in Solomon Islands.
- Exemption of internal taxes and other fiscal levies imposed to the Japanese nationals concerned in Solomon Islands for supply of goods and services for the project.
- Preparation and budgetary arrangements for the operation/maintenance expenses of the equipment supplied under the grant aid.

(4) Project schedule

After the conclusion of the Exchange of Notes concerning the project between the Governments of Solomon Islands and Japan, a consulting firm of Japan will conclude an agreement regarding consulting services with the Government of Solomon Islands, on the basis of the content of the Exchange of Notes.

The consulting firm will prepare necessary tendering documents, which are to be authorized by the Solomon Islands Government, and render help to hold the tender after a necessary pre-qualification investigation. Based on the result of tender evaluation, the consulting firm will recommend a successful tenderer to the Solomon Islands Government.

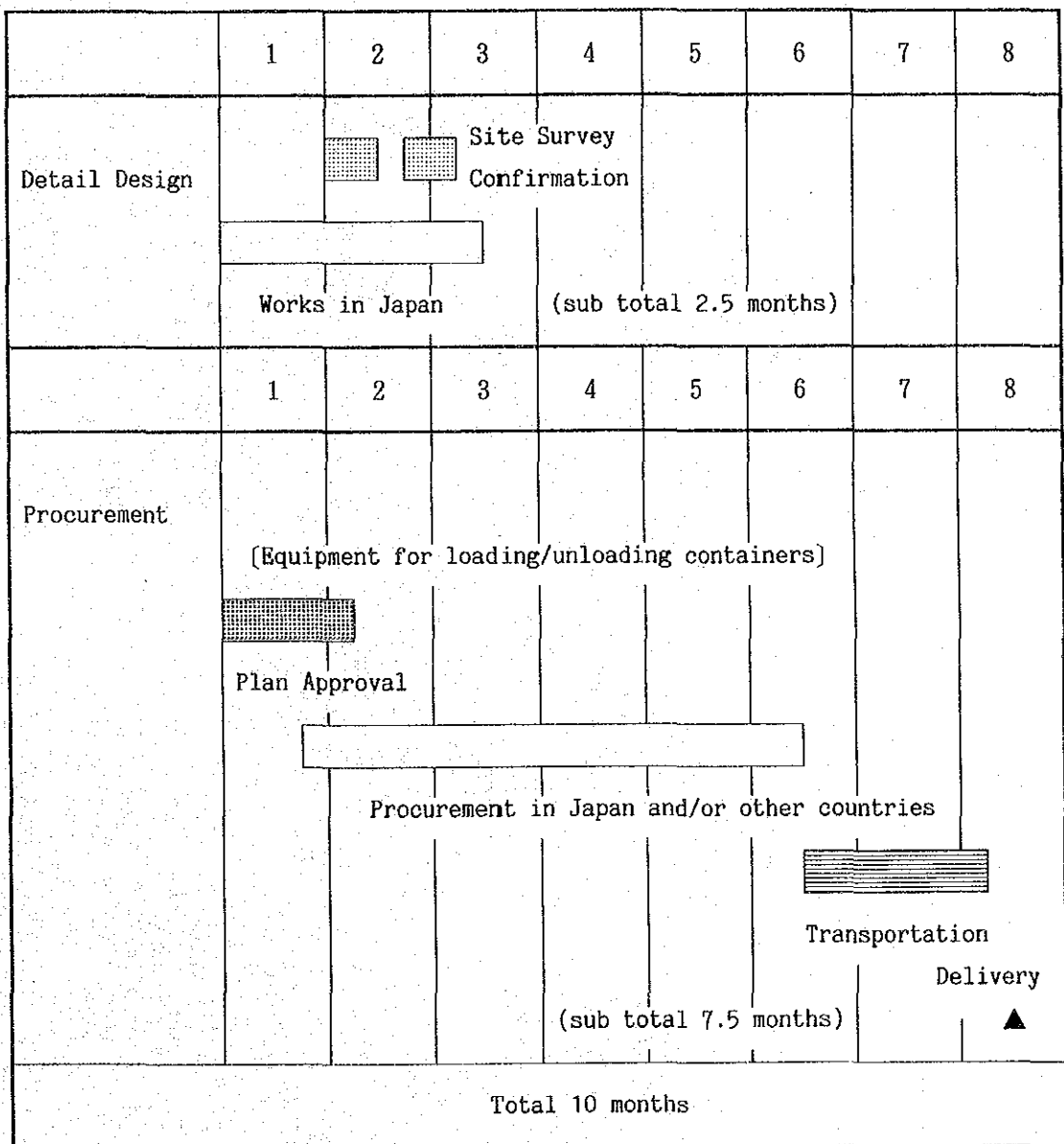
The successful tenderer will conclude an agreement on supply of the equipment and spare parts for the project, on the basis of the content of the tender, with the Solomon Islands Government, and procure and manufacture the necessary equipment and materials in accordance with the plans and drawings approved by the consulting firm. Meanwhile the consulting firm will conduct necessary inspections including test working, report the progress of the project to the

Governments of Japan and Solomon Islands. After the completion of controlling business, the consulting firm will receive a completion certificate of the project from the Solomon Islands Government, when the project will be finished.

The project will require about 10 months; about 2.5 months for the detail design, about 6 months for preparation, manufacturing, and procurement, plus about 1.5 months for marine transportation.

The project schedule is shown in Figure-2.

**Figure-2 Project Schedule**





CHAPTER 5

EFFECTS OF THE PROJECT

AND

RECOMMENDATIONS



## Chapter 5 Effects of the Project and Recommendations

On the evaluation of the project, a quantitative evaluation was tried as far as possible on the basis of the aim of the fisheries development in the national development plan, the objective of the project, and the indices on the achievement of the objective of the project. A qualitative evaluation was however applied when statistical data and reliable indices were unavailable.

### 5-1 Direct Effects to the Fish Processing

#### (1) Reduction of the time for shipment

The 1991 canned products for export were about 440 thousand cases according to Table-5 "Processing Products for Export & Number of Containers at Noro Port," representing 275 TEU at the number of containers. On an average, some 1,600 cases for 1 TEU must be carried daily by trucks from the cannery to the Noro port, at which they are transported to containers. All these works are done manually by about 10 workers, using 3 units of 10 ton truck, and trucks often get out of order and bad weather sometimes prevents the work, resulting in a poor work efficiency. It will take about 2 hours to handle 1,600 cases at the rate of 5 seconds a case, and this work is repeated at least 3 times, loading at the cannery, unloading from trucks, and transporting to containers at Noro port. Though the distance between the cannery and Noro port is as short as only about 1.5 km, the work requires a full daytime working hour including turnaround time. The self-loading/unloading trailer tractor makes it possible to load canned products directly to containers, reducing the shipment hour to one-third.

**Table-4 Processing Products for Export & Number of Containers at Noro Port**

	1987	1988	1989	1990	1991	1992	1993~
<b>Exports</b>							
Canned('000 case)	136	157	162	332	440	560	700
Arabushi(ton)	313	342	409	462	406	500	500
Fishmeal(ton)	-	-	322	713	968	1000	1000
<b>No. of containers for export(TEU)</b>							
for canned products	102	116	140	270	349	425	515
for arabushi	85	98	101	207	275	350	425
for fishmeal	17	18	22	25	22	25	25
for general cargo	-	-	17	38	52	50	50
	-	-	-	na	na	25	28*
<b>No. of containers for import(TEU)</b>							
for meat, salt, etc.	27*	31*	32	368	527	580	705
for general cargo	-	-	-	na	na	350	386*
	-	-	-	na	na	180	199*
<b>Total containers for export/import(TEU)</b>							
of which	129*	147*	172	638	876	1560	1833
for fisheries	129*	147*	172	638	876	1005	1220

\* : Estimated

(Source: STL and SIPA publications)

(2) Improvement of transport service and reduction of the labor for transport

STL has a plan for increasing canned products for export from 440,000 cases in 1991 to 700,000 cases in 1993, and the 1992 outputs was estimated at about 560,000 cases, a good performance for the target. Its container handling and shipment system however seems to reach the limit. As of December 1992, STL employs 125 male workers plus 489 female workers, totalling 614, of which some



10 male workers are engaging in shipment work. The improvement of transport service by means of reduction of the time for shipment will make it possible to reduce the current labor for shipment to one third, and the the transfer of the saved labor to production will contribute to the achievement of the plan for increasing outputs by 25%, from 560,000 cases to 700,000 cases.

(3) Decrease of dents of canned products

At present the carton boxes have to be transported by trucks to the wharf of Noro port where the empty containers are placed here and there, and unloaded and stored in containers, at least three times of handling manually. During these transshipment, the canned products are prone to receive dents, probably at the rate of one case for ten palettes (960 cases). When 700,000 cases are handled during the year, damaged cases will be 2,100 cases ( $0.001 \times 3 \times 700,000$ ), almost one 20 ft container load. The provision of the self-loading/unloading trailer tractor will make it unnecessary to handle containers manually at the wharf, that is 2 handlings, resulting in decrease of dents of canned products to one-third, some 700 cases.

(4) Other expected effects

All the materials for the cannery such as cans, oil, salt, and so on are imported by containers, which were about 580 TEU in 1992. These are handled in a reverse proceeding, and since the self-loading/unloading trailer tractor makes it possible to handle container cargoes anywhere it can go, all the materials for the cannery can be carried directly to the cannery in containers.

## 5-2 Effects to the Container Handling System in Noro Port

(1) Improvement of container handling work efficiency

At present two pairs of a 6 ton forklift and an arbilift are working. Each pair need three workers, one driver of the forklift, one assistant for hooking/unhooking the hanging hooks of the arbilift, and one supervisor. It takes 10 minutes to handle a container on an average. The provision of the 28 ton forklift makes it unnecessary to hook/unhook on container, resulting in reduction of the labor to two persons, and reducing the time for container handling to only 1 or 2 minutes. In addition, the existing arbilifts can be

still used to move the containers in the container yard, which improves operation efficiency.

(2) Increase of the stocking number of containers

The combination of a forklift and an arbilift can only move a container horizontally, and also need a space around a container, 60 cm at least, for hooking/unhooking work. A 6 ton forklift cannot stack containers unless a container is empty. The provision of the 28 ton forklift makes it possible to stack containers in three stacks, and also makes it unnecessary to keep a working space between containers when the containers contain the same lot of cargoes need not to handle independently. Hence it makes possible to utilize the container yard in three dimensions, resulting in an increase of the number of containers stocked.

(3) Other effects

On the operation of arbilift, a container must be slanted lengthwise by 5° or 6° for hooking/unhooking work, which slant may give a damage to cargoes inside the container due to their movement. There is no need for such slanting work on the operation of 28 ton forklift, which will reduce damages of cargoes and improves the reliability of container handling work.

### 5-3 Effects to Local Industries

The annual amount of exports and imports regarding the fisheries and fish processing in Noro port is 24,250 tons (8,500 tons of export and 15,750 tons of imports), accounting for about 52% of the total exports and imports. Major items other than fishery products are 10,000 tons of copra for export, while 7,000 tons of general cargoes and 5,000 tons of fuel oil. Of which copra and fuel oil are imported in bulk but, according to SIPA, some 70% of general cargoes are imported in containers and this ratio reaches now 82% in case of Honiara. At present almost all of food and some 38% of timber are imported or exported in containers in Noro, and it is expected that the containerization ratio of cargoes increases to 90% by 1995. Hence, with timber exports increasing under accelerating rural development the improvement of the container handling system will contribute to the development of local economic activities.

#### 5-4 Conclusion and Recommendations

Noro port is the hub of international trade next to Honiara, and the development of the district is of pressing necessity. The Noro fishery is, as one of a few key industries, supporting the development of the district, contributing greatly to the local economy by earning foreign currency, creation and increase of employment opportunity through fish production activities, export of processing outlets, and import of inputs for processing such as cans, oil, and salt. However, the present sluggish international canned product market calls for support in local industries other than the fisheries in order to activate the local economy. The copra export of Noro are now two thirds of the one of Honiara, and other goods are increasingly being exported and imported with fish processing products increasing. The basic infrastructure for the development of the Noro district such as roads, port facilities, fishery related facilities, oil tanks, and a community center has been improved by European Bank for Reconstruction and Development (EBRD), Asian Development Bank (ADB), and Japan's grant aid, but the container handling system remains unchanged, which is incapable of deal with the increasing container cargoes including canned products. The provision of the equipment for loading/unloading containers under the project ensures the development of not only the fishery and fish processing but also other local industries through the improvement of the container handling system.

The objective of the project, which is in line with an integral development plan of Noro port, is to provide the fishing industry with reliable and efficient container handling service necessary for the export of canned products to the international markets and the import of materials necessary for production, supporting an increase in production of Noro fisheries with processing facilities completed. Besides, since general cargoes including daily necessities are being imported in containers, the population that will benefit from the project includes the people of Noro, Munda, and other parts of New Georgia Island as well as fishermen, fishery related people, and port workers, reaching about 5,000. Indirectly, the project will activate the economic activities in the whole Western Province through an increase of container cargoes imported or exported. The Noro fishery is now contributing to the local development by an increase of employment opportunity and improvement

of cash incomes. The implementation of the project aiming at demolishing a barrier to the achievement of a production increase to 700,000 cases of canned products will lead immediately an increase of export and thereby contribute to the national economy as well as the local economy by earning foreign money.

The Ministry responsible for the project is the Ministry of Natural Resources, and the agency in charge of operating the equipment when it is supplied is Solomon Islands Ports Authority (SIPA), in consulting with the Fisheries Division of the Ministry of Natural Resources. SIPA, well experienced in the management of Honiara port, has a full know-how concerning the operation and maintenance of the container handling equipment.

From the viewpoint of the expected profound effects and the contribution to the improvement of the living standard of the people as mentioned above, the project deserves to be implemented. Also it is recommended that a utilization plan of the equipment for creating/maintaining container yard originally requested, together with an integral development plan, including a land reclamation plan, of Noro port should be finalized.

## APPENDIX



## APPENDIX

- I
  - ① Members List of Study Team
  - ② Study Itinerary
  - ③ List of Persons Concerned
  - ④-A Organization Chart of Solomon Islands Government
  - ④-B Organization Chart of Implementation Agencies
  - ⑤ Minutes of Discussions
  
- II
  - ① Photographs
  - ② Equipment for loading/unloadong containers
  - ③ Container Stocking Plan

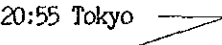

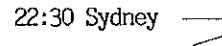







## Members List of Study Team

Tatsuo, SAITO	Leader Special Adviser to the Minister of Agriculture, Forestry & Fisheries on International Affairs (Fisheries)
Hitoshi, FUJITA	Small scale Fisheries Development Policy Planner Chief of Section, Office of the Overseas Fisheries Cooperation, Fisheries Agency
Mamoru, KONDO	Fisheries Promotion Planner D & A Engineering Co.,Ltd.
Masakazu, ISHII	Equipment/Materials and the Cost Estimate Planner D & A Engineering Co.,Ltd.

## Study Itinerary

	November	Governmental Officials	Accommodation	Consultants		Accommodation	
				Fisheries Promotion Planner	Equipment/Materials, Cost Estimation		
1	11 Wed.	20:55 Tokyo 					
2	12 Thu.	 08:10 (NZ024) Nadi Courtesy Call to Japanese Embassy			12:50 Nadi ⇌ 16:00 Honiara (FJ504)	Honiara	
3	13 Fri.	Courtesy Call on the Ministry of Natural Resources. Discussion with SIPA				Honiara	
4	14 Sat.	07:10 Honiara ⇌ 08:30 Munda (Noro)			Site Survey,	Noro	
5	15 Sun.	Team Discussion					
		12:40 Munda ⇌ 14:10 Honiara	Honiara	same as Officials	Site Survey	Honiara/ Noro	
6	16 Mon.	Discussion	Honiara	-ditto-	Site Survey	Honiara/ Noro	
7	17 Tue.	Signing of Minutes of Discussion Discussion with Fishery Division Team Discussion	Honiara	-ditto-	Site Survey	Honiara/ Noro	
8	18 Wed.	16:10 Honiara ⇌ 23:50 Auckland (IE710)	Auckland	Collection of Materials	Site Survey	Honiara/ Noro	
9	19 Thu.	17:30 Auckland ⇌ 18:45 Sydney (QF044) 22:30 Sydney 		Collection of Materials	Technical studies	Honiara/ Noro	
10	20 Fri.	 06:05 Tokyo(QF021)		Meeting with SIPA		Honiara/ Noro	
11			21	Sat.	Collection of Materials	12:30 Munda ⇌ 14:00 Honiara	Honiara
12			22	Sun.	Technical studies		Honiara
13			23	Mon.	Collection of Materials		Honiara
14			24	Tue.	Meeting with SIPA		Honiara
15			25	Wed.	16:10 Honiara ⇌ 23:50 Auckland		Auckland
16			26	Thu.	17:30 Auckland ⇌ 18:45 Sydney 22:30 Sydney 		
17			27	Fri.	 06:05 Tokyo(QF021)		

## List of Persons Concerned

## Ministry of Natural Resources &amp; Environment .

Mr. Victor S. Ngele : Minister  
 Mr. Bernard Telei : Senior Environment Officer  
 Mr. Alberto Wata : Director of Fisheries  
 Mr. Sylvester Diake : Pricipal Fisheries Officer

## Ministry of Provincial Government

Mr. Patteson Oti : Permanent Secretary  
 Mr. Johnson Airau : Director, Bilateral Aid Management Project

## Ministry of Foreign Affairs and Trade Relations

Mr. Fred Fakarii : Chief of Asian Section

## Prime Minister Office

Mr. Walton Abuitoo : Assistant Secretary(Policy)

## Solomon Islands Port Authority; (SIPA)

Mr. NB Kabui : General Manager  
 Mr. Bill Barile : Ports Engineer  
 Mr. Nicholas J. Constantine : Secretary  
 Captain Bennet Muller : Noro Wharf Manager

## Ministry of Agriclture &amp; Lands

Mr. Cameron R.Eta : Chief Quarantine Officer

## Ministry of Health &amp; Government Services

Mr. Henry Pika : Chief Collector of Customs

## Solomon Taiyo LTD.

Mr. Takeo Susukida : Commercial Manager .

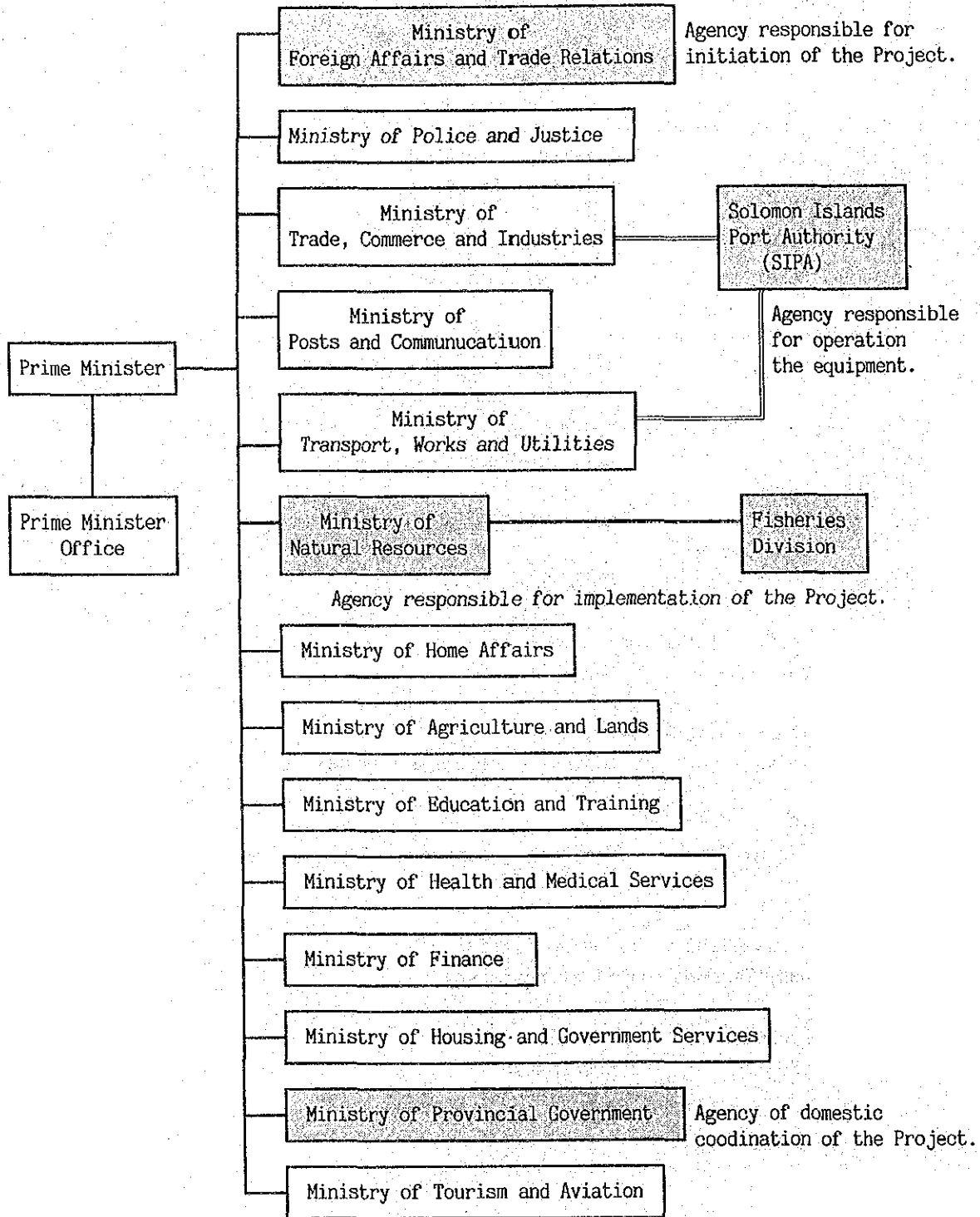
## Japanese Embassy

Mr. Noboru Kawagishi : Charge D'affaires  
 Mr. Nobuyoshi Watanabe : First Secretary

## JICA, Japan Overseas Cooperation Volunteers

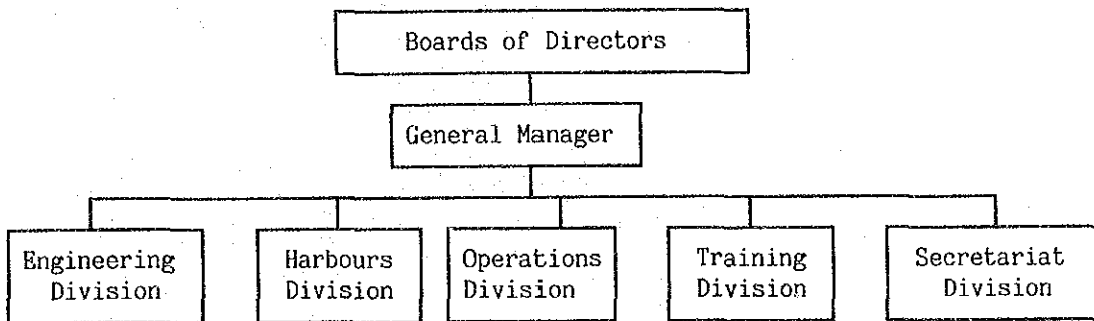
Mr. Yasuo Kasai : Coodinator

### Organization Chart of Solomon Islands Government

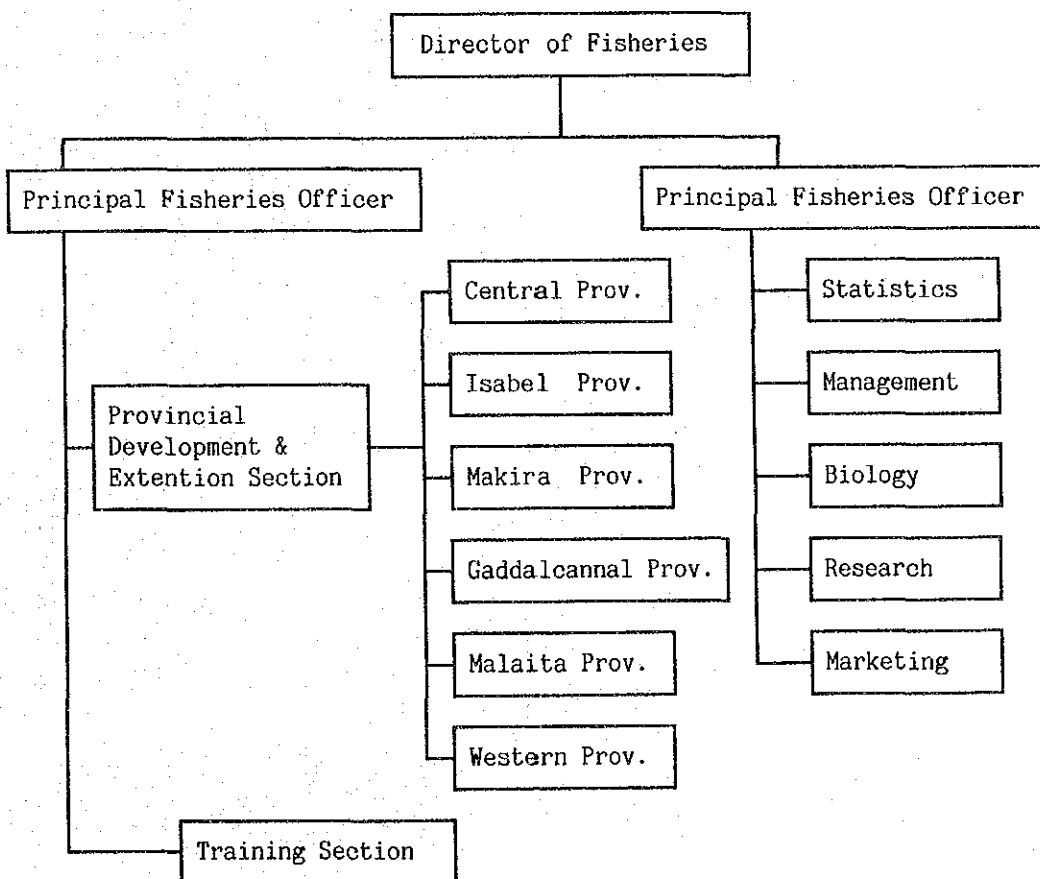


## Organization Chart of Implementation Agencies

### Solomon Islands Port Authority(SIPA)



### Fisheries Division





Minutes of Discussions





MINUTES OF DISCUSSIONS  
 BASIC DESIGN STUDY  
 ON  
 THE PROJECT FOR PROCUREMENT OF  
 EQUIPMENT FOR IMPROVING CONTAINER  
 HANDLING SYSTEM IN NORO.  
 IN  
 SOLOMON ISLANDS

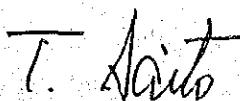
In response to a request from the Government of Solomon Islands, the Government of Japan decided to conduct a Basic Design Study on the Project for Procurement of Equipment for Improving Container Handling System in Noro (hereafter referred to as "the Project"), and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Solomon Islands a study team, which is headed by Mr. Tatsuo Saito, Special Advisor to the Ministry of Agriculture, Forestry and Fisheries, on International Affairs (Fisheries), and is scheduled to stay in the country from November 12 to November 18, 1992.

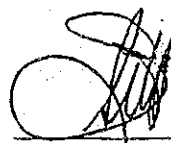
The team held discussions with the officials concerned of the Government of Solomon Islands and conducted a field survey at the study area.

In the course of discussions and field survey, both parties have confirmed the main items described on the attached sheets. The team will proceed to further works and prepare the Basic Design Study report.

Honiara, November 17, 1992.



Mr. Tatsuo Saito  
 Leader of  
 Basic Design Study Team  
 JICA



Mr. Patteson Oti  
 Permanent Secretary  
 Ministry of  
 Provincial Government

## ATTACHMENT

### 1. Objective

The Objective of the Project is to improve container handling system in Noro for the intensification of canned tuna production and its export to the international markets.

### 2. Project site

The Project site is Noro Port on the Island of New Georgia, Western Province, as shown in Annex I.

### 3. Executing Agency

Fisheries Division of the Ministry of Natural Resources  
Solomon Islands Ports Authority

### 4. Items requested by the Government of Solomon Islands

After discussions with the Basic Design Study team, the following items were finally requested by the Government of Solomon Islands.

- (1) Forklift
- (2) Self-loading/unloading trailer tractor
- (3) Bulldozer
- (4) Backhoe-Hydraulic Excavator with Breaker
- (5) Tractor Shovel-Wheel Loader
- (6) Tipper Trucks-Dump Trucks
- (7) Compactor-Vibratory Roller
- (8) Road Grader

However, the final components of the Project will be decided after further studies, in particular item (3) through item (8) will be subject to review based on a utilization plan of equipment and materials, a reclaiming plan, and so forth.

5. Japan's Grant Aid System

- (1) The Government of Solomon Islands has understood the system of Japan's Grant Aid explained by the team.
- (2) The Government of Solomon Islands will take necessary measures, described in "Annex II" for smooth implementation of the Project, on condition that the Grant Aid Assistance by the Government of Japan is extended to the Project.

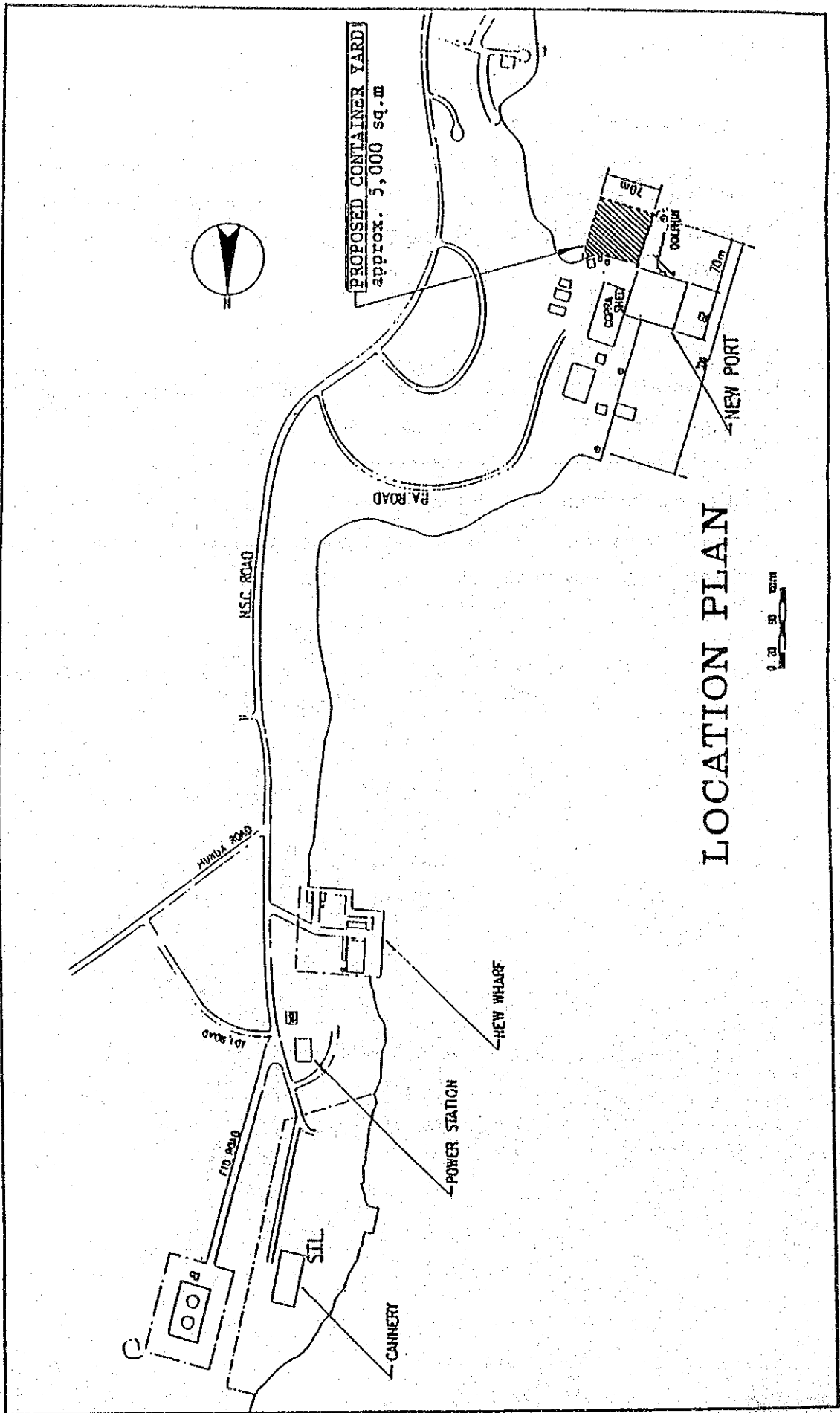
6. Schedule of the Study

- (1) The consultants will proceed to further studies in Solomon Islands until November 25, 1992. The Government of Solomon Islands will prepare all the data requested by the Team in accordance with Inception Report.
- (2) Based on the Minutes of Discussion and technical examination of the study results, JICA will complete the final report and send it to the Government of Solomon Islands by the end of March 1993.

J.P.O.

T.A.

ANNEX I



F.P.O

T.A.

## ANNEX II

Necessary measures to be taken by the Government of Solomon Islands in case Japan's Grant Aid is executed.

1. To bear commissions to the Japanese foreign exchange bank for the banking services based upon the Banking Arrangement.
2. To exempt taxes and to take necessary measures for custom clearance of the materials and equipment brought for the Project at the port of disembarkation.
3. To accord Japanese Nationals whose services may be required in connection with the supply of products and the services under the verified contract such facilities as may be necessary for their entry into Solomon Islands and stay therein for the performance of their work.
4. To maintain and use properly and effectively the equipment purchased under the Grant.
5. To bear all the expenses other than those to be borne by the Grant, necessary for the equipment as well as for the transportation and the installation of the equipment.

J.P.O.

T.A.



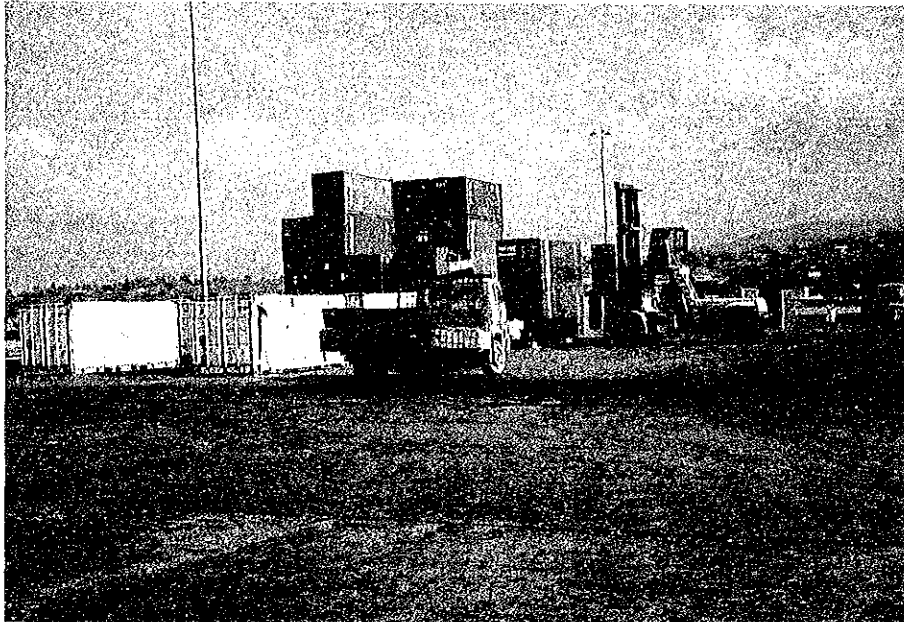
Photographs







① Container tractor with a sidelifter  
(Honiara)



② Honiara port Container yard  
(Honiara)



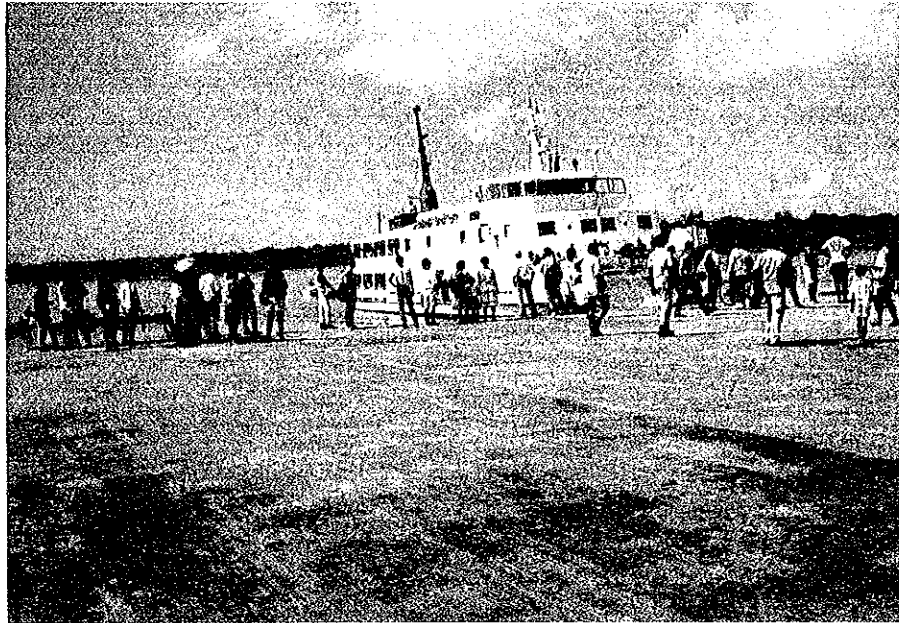


- ③ Noro port, Container yard  
Cargos are loaded in the container at the container yard due to the lack of a forklift capable of handling a full loaded container.



- ④ Noro port, Container yard  
Loaded containers can not be stacked.





⑤  
Noro port  
Inner-islands  
Vessel

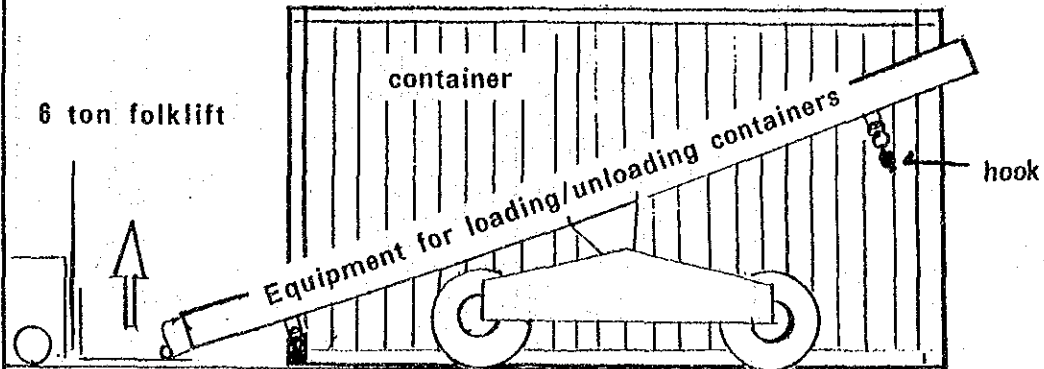


⑥ Forklift  
in Noro town

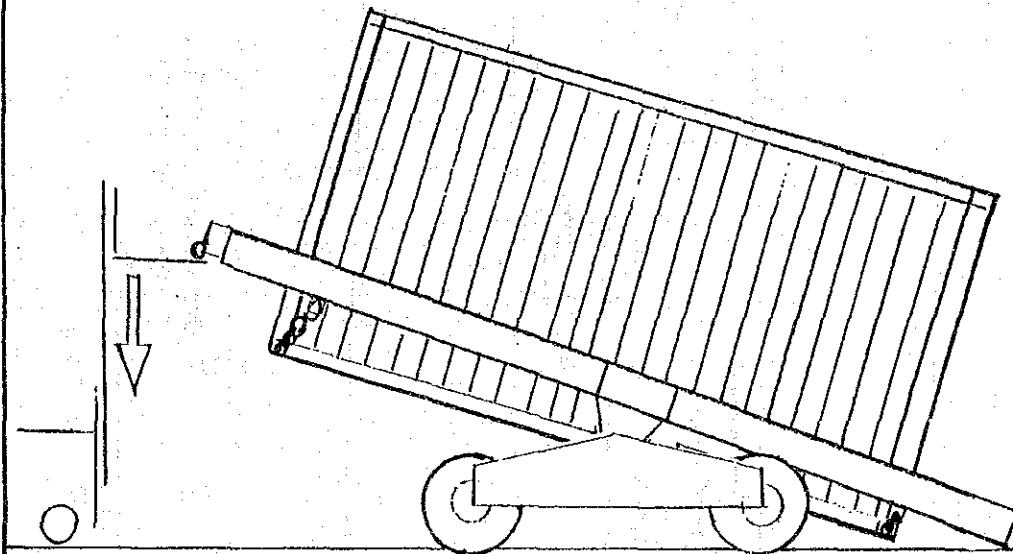


II - ② Equipment for loading/unloading containers

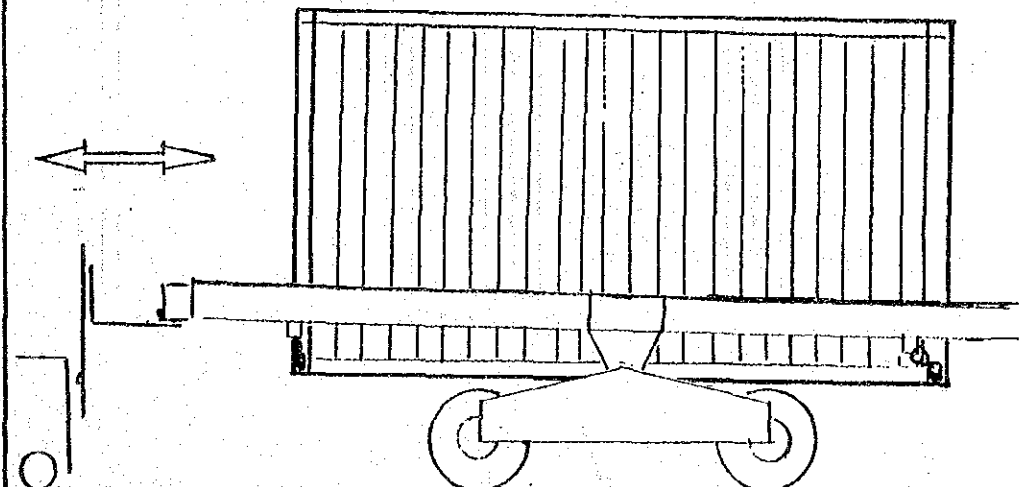
1. Hook the one side of container



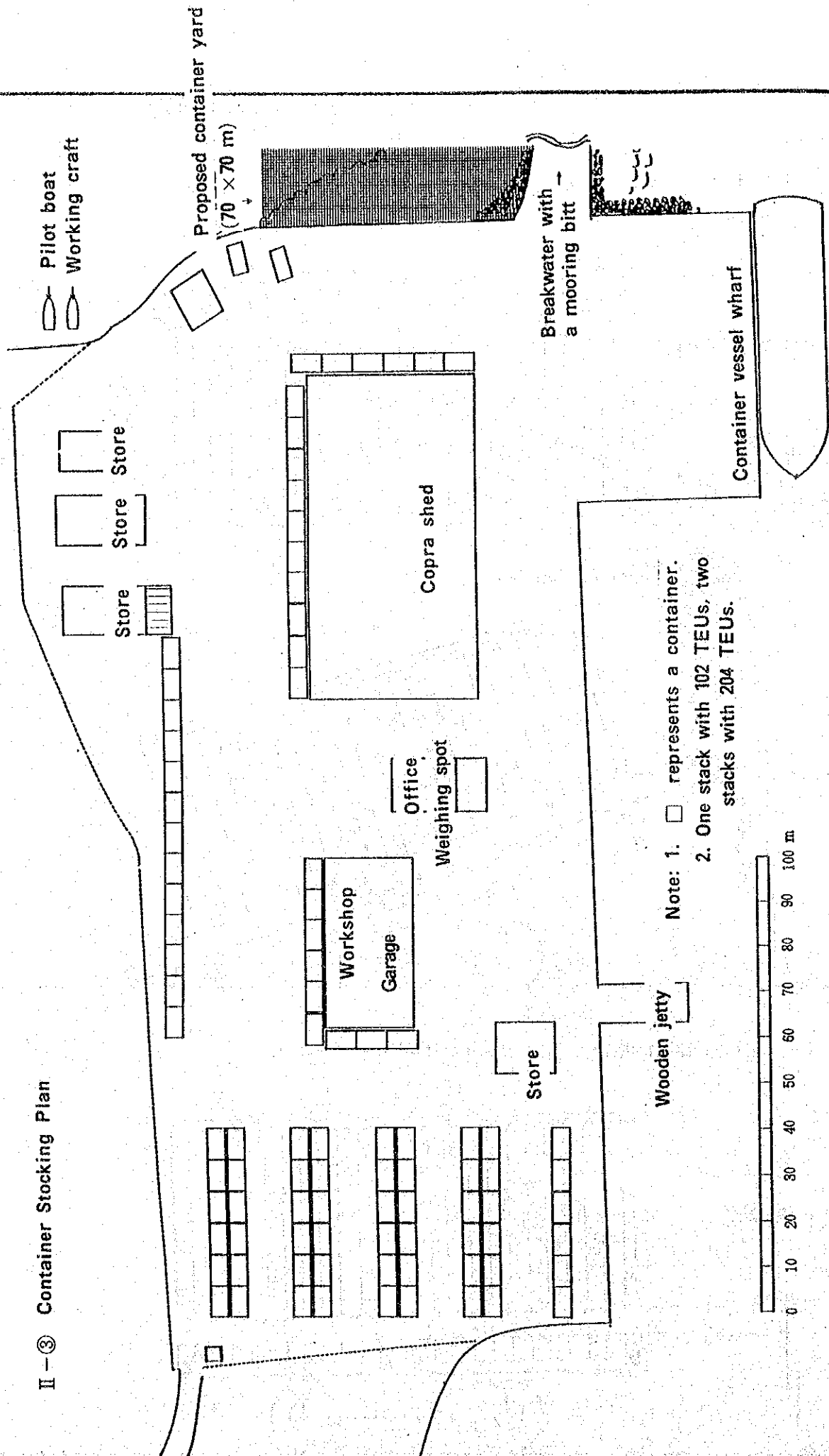
2. Hook other side of container



3. Down the forklift to the middle level and track it.



II - ③ Container Stocking Plan







JICA