

**BASIC DESIGN STUDY REPORT  
FOR  
FISHERIES DEVELOPMENT PROJECT  
IN  
SOLOMON ISLANDS**

October, 1981

Japan International Cooperation Agency

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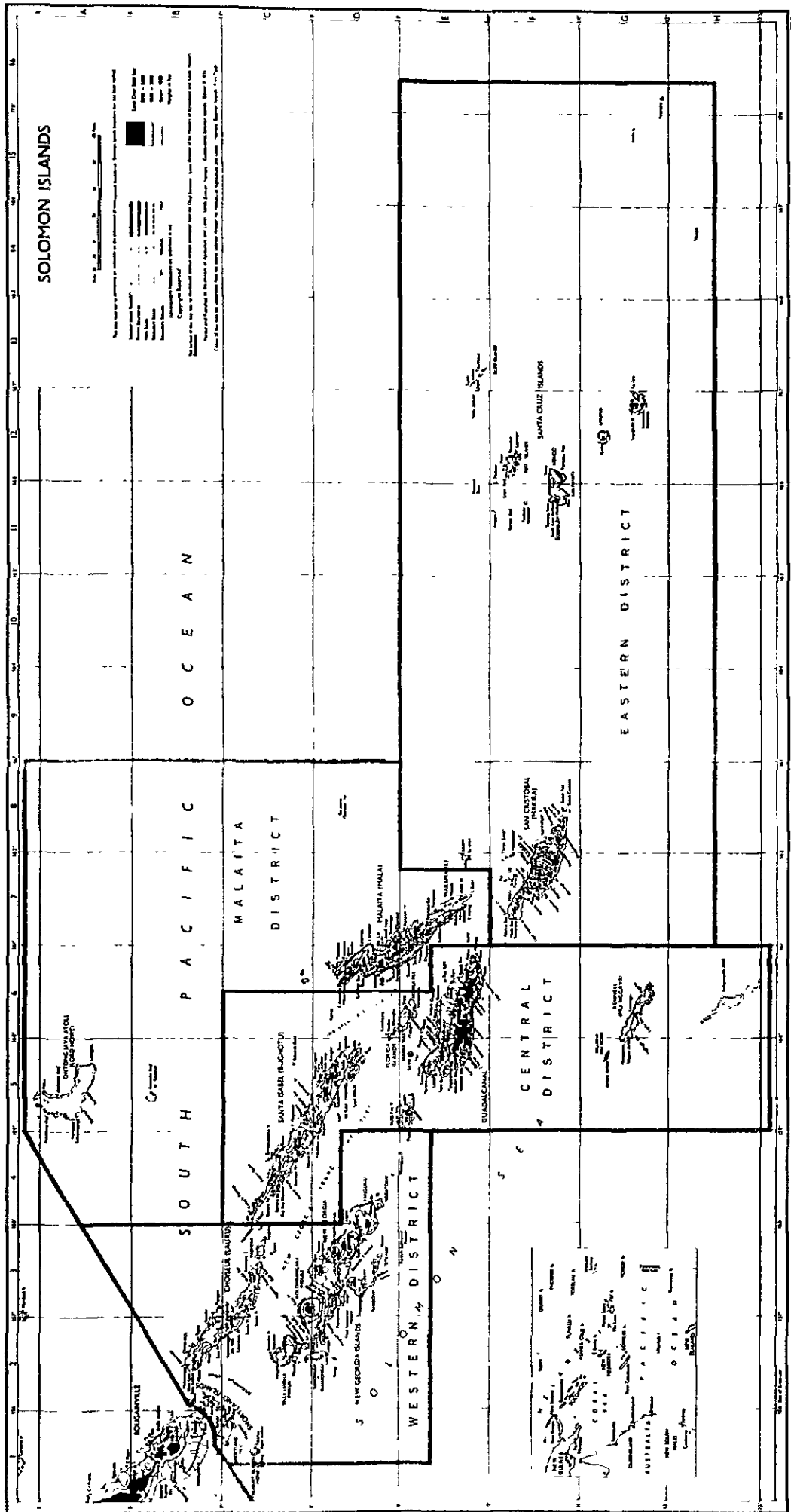
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## P R E F A C E

In response to a request of the Government of Solomon Islands, the Japanese Government decided to conduct a study on the Rural Fisheries Development Project and entrusted the study to the Japan International Cooperation Agency.

The J.I.C.A. sent to the Solomon Islands a survey team headed by Mr. Kazuo Takayama, Head Fishing Boat Inspector, Fisheries Agency, Ministry of Agriculture, Forestry and Fisheries, from August 16 to September 2, 1981.

The team exchanged views with the officials concerned of the Government of Solomon Islands and conducted a field survey in Honiara, Auki, Afio, Gizo, Munda, Kirakira, Yandina, Tulagi and Santa Cruz.

After the team returned to Japan, further studies were made and the present report has been prepared.

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

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

October, 1981



Keisuke Arita

President

Japan International Cooperation Agency



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## **SUMMARY**



## SUMMARY

The country of Solomon Islands is located in the northeast sector of the Australian Continent in the South Pacific Ocean and consists of 6 major islands which stretch toward northwest in parallel and of numerous islands. The total land area is about 29,000 km<sup>2</sup> with a population of about 230,000 as of 1980. This country had been under British sovereignty for a long time but became independent in 1978 and started its own steps as a developing country in the South Pacific.

It has only been a short time since she became independent. The Solomon Islands must rely on development and export of its natural resources to consolidate its economic foundation which is essential for the development of the country, and as such is able to meet the requirements of materials and foodstuff needed by the people by exporting natural resources, such as copra, marine products, lumber and palm oil. Marine products share about a quarter of the export quantity and fishery is a very important industry for the country. The growth of copra and lumber exports are not as rapid as it used to be, but the exports of marine products are increasing. This makes the fishery industry more and more important from the national economic point of view.

The fisheries have been developed by various policies enforced by the Fisheries Division established within the Ministry of Natural Resources in 1973, with the emphasis being put on for establishing of fisheries on a commercial basis in the beginning. The measures were quite effective to record substantial increases in the catches, employment and export in the fisheries. The Solomon Islands Government also put emphasis on development of rural fisheries to eliminate economical unbalance of development in such rural areas since 1975, and some achievements have been made in increasing employment of the rural inhabitants, implementation of training fishermen and securing of nutrition sources.

Based on the current fishery state thus outlined, the Solomon Islands Government planned to implement a new rural fisheries development project to distribute the marine equipment and gears for the further development of the fisheries. The Solomon Islands Government asked the Japanese Government for grant assistance of fisheries centres and equipment and materials for fisheries, which will play an important role in the rural fisheries development project.

The country of Solomon Islands consists of many islands scattered in a vast oceanic area expanding to 1,500 km in the east-west direction and 850 km in the south-north direction. Since all islands are mostly covered with jungle growth, people make their livelihood in villages along the coast line of each of the islands. This geographical condition makes her difficult or almost impossible to set up an on-shore transportation system, but by far easier by sea.

The Solomon Islands Government has been making efforts in improving maritime transportation means. Now they drafted a maritime transportation development plan ready to enforce it to aim at improving the nation-wide maritime transportation network. In this plan, since the replacement of inter-island vessels are of the immediate necessity to mobilize in services, the Solomon Islands Government requested the Japanese Government for the vessels under the grant assistance programme.

The Japanese Government determined to review the requested contents entirely under the Japanese grant assistance programme and dispatched a study team to the Solomon Islands for 18 days from August 16 to September 2, 1981, under the responsibility of the Japan International Cooperation Agency.

Based on the discussion and study made by the team with the related parties of the Solomon Islands and based on field surveys on the construction sites, harbors and shipbuilding yards, the contents were determined in consideration of various conditions in line with the actual state of the Solomon Islands.

The fisheries centres are designed to function as bases for fisheries development activities, i.e. fishermen's training, and distribution and sales of fish. In addition, they are equipped with fisheries officers' office and accommodation for trainers. On the basis of the request of the Solomon Islands Government, 4 sites were selected for the fisheries centres and the buildings were designed to construct in consideration of the flexibility, ability of the local workers, natural conditions and living styles of the islands.

The fish collection vessel is scheduled to collect fish caught in rural areas and to transport them to the distribution centres. In consideration of the environmental state of the water, jetties and the maintenance of the vessel, FRP (Fiber Reinforced Plastic) small vessel will be selected.

Ice-boxes used by rural fishermen are to store and transport fish with ice to a designated fisheries centre. Since the ice-boxes produced manually by a company in the Solomon Islands are quite effective in use but not fully utilized by fishermen, we determined to adopt the same type of ice-boxes for this project to improve the existing state of temporary storing fish with ice.

The inter-island vessels are strongly expected to replace old wooden vessels to improve the existing transportation capacity for the smooth flow of people, urban and local, and commodities among islands. These vessels are designed to operate easily, to cause less troubles and to repair without difficulty.

As mentioned before, it is quite significant that this project as one of the development bases will play an important role in developing the sectors of fisheries and maritime transport in which the Solomon Islands Government hopes to improve much on the implementation process of her development policies. If the grant assistance is to be implemented regarding the fisheries centres and fishing gears, about half of the project, namely 4 out of 8 fisheries centres, one fish collection vessel, 250 out of 500 ice-boxes will be achieved under the rural fisheries development project being initiated by the Solomon Islands Government, and will strongly gear ahead to improve the existing state. Owing to the actual implementation of the project, the effects will, on one hand, turn out to increase fish catch, to improve the marketing system, and the broader training chances at the fisheries centres, and on the other hand, to improve the international balance of payment in relation to the increase of fishermen's cash income and employment, the improvement of general people's dietary life and export and others. Furthermore, it is quite true that the effects incurred by the Japanese grant assistance in the previous year has activated local fisheries, i.e. by manufacturing fishing gears and ship building, and other industries.

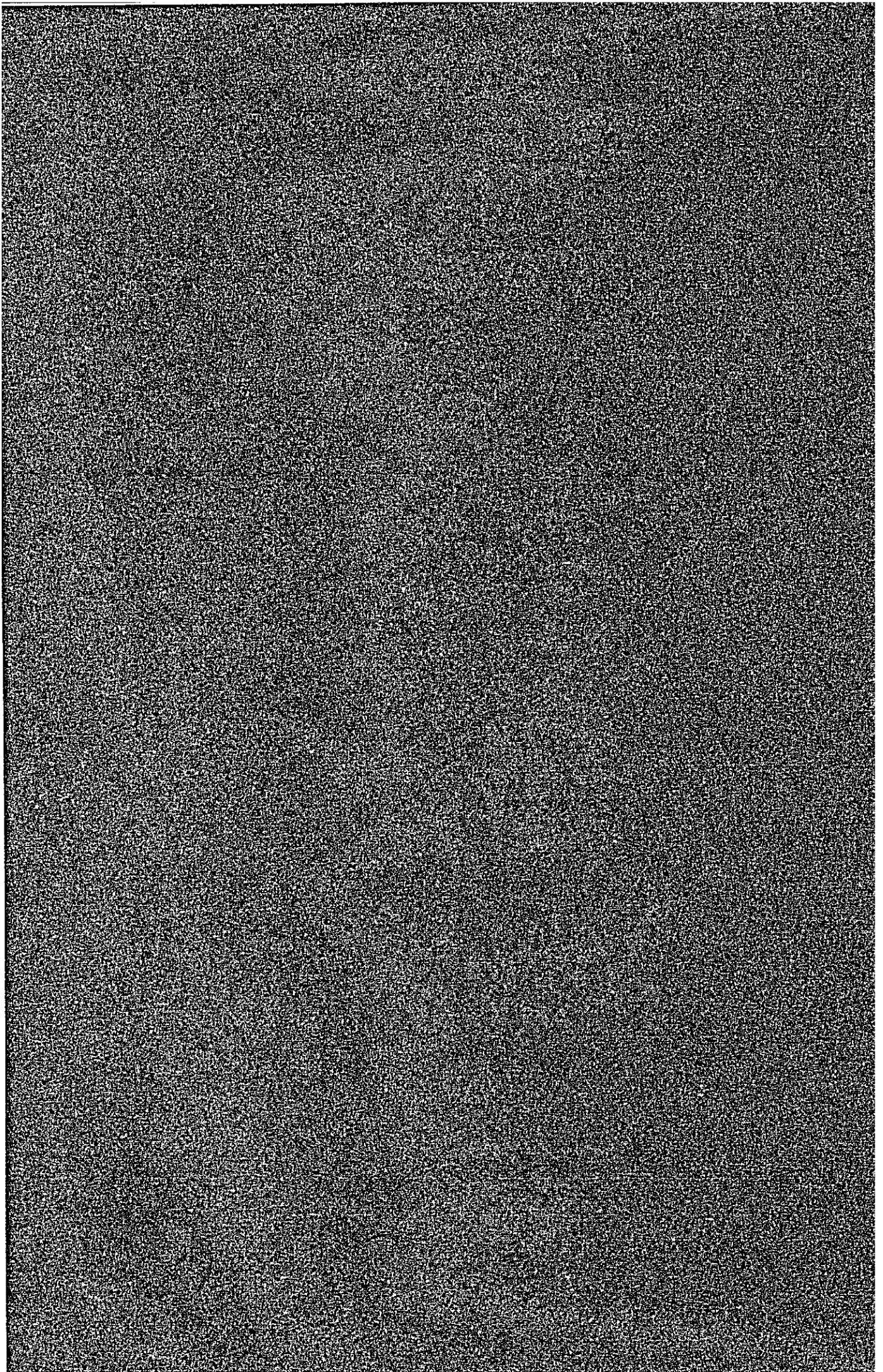
As for the inter-island replacement vessels, it is approved in general that the implementation of Japanese grant assistance will help her generate the old wooden vessels into the new steel vessels for the purposes of securing the navigation in safety and the smooth communication among inhabitants in the numerous islands, which will help her unite the national consensus. If this comes true, the effects will be much expected to magnify the development of fisheries by reinforcing the transportation capacity of marine/marine oriented products, fishing gears, etc., and also boost up the development of marketing economy.

It goes without saying that from socio-economic point of view for the Solomon Islands, non petroleum producing and developing country, this project will contribute much to the friendships between two countries if it comes true.

Besides, it won't overlap the other assistant programmes from the UN and the other countries, and won't interfere much to Japan's cooperation. Although the Solomon Islands is obliged to rely on overseas budgetary assistance, it shows that her international balance of payment tends to aggravate further, while the British assistance to this country is rather stagnant to increase. In the light of the above, she is looking forward to receiving Japan's grant assistance ear-marked to this project. It will be quite effective and timely if Japan puts a positive consideration to it.

## **CHAPTER 1**

# **CIRCUMSTANCES AND PURPOSE OF SURVEY**





## CHAPTER 1 CIRCUMSTANCES AND PURPOSE OF SURVEY

In order to level up the country more properly, the Solomon Islands Government planned a rural fisheries development project as part of the development policies in the country. The project aims at improving the living standards of local inhabitants, to carry out the regional development in general by effectively utilizing abundant marine resources and by increasing productivity in fisheries, employment opportunities, cash income from sales of fish, and others.

With such background, the Solomon Islands Government requested grant assistance from the Japanese Government for the fisheries centres and fishery materials and equipment which would be important factors in the rural fisheries development project.

At the same time, the Solomon Islands Government requested grant assistance for replacement of inter-island vessels, which are playing very important roles in the communication among the inhabitants scattered in the extensive oceanic area as the current vessels are becoming obsolete.

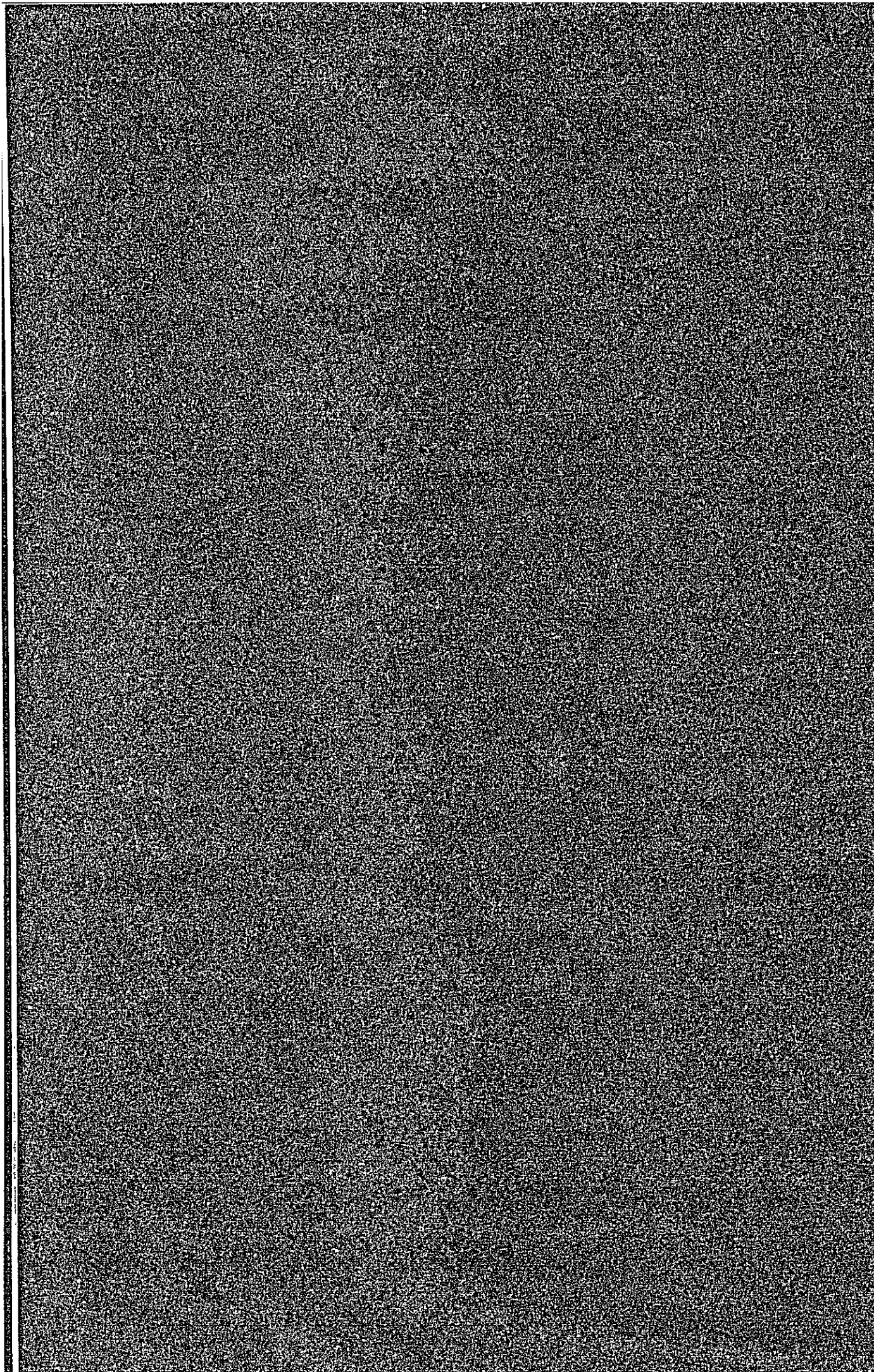
In response, the Japanese Government has determined to study the request as a part of its grant assistance project and dispatched a study team to the Solomon Islands for 18 days from August 16 to September 2, 1981, through the charge of the Japan International Cooperation Agency for the purpose of preparing a basic design study report after giving positive consideration to technical and economical adaptability for implementation and validity and effect of the grant assistance.

The study team conducted the field surveys at the scheduled construction sites, harbor and shipbuilding yards and consulted with the related parties of the Solomon Islands Government. The team finally recognized the necessity and validity of implementing this project.



## **CHAPTER 2**

### **BACKGROUND**



## CHAPTER 2 BACKGROUND

### 2-1 Outline of the Country

#### 2-1-1 General features

The Solomon Islands is a volcanic archipelago that surrounds the east side of the Australian continent, about 6,000 km south-south-east of Japan and consists of 6 major islands lined in two rows and numerous small islands scattered around the main six.

The total land area of the islands located in the Pacific Ocean between east longitude 155° and 170°, south latitude 5° and 12° is about 29,000 km<sup>2</sup>. The number of islands is about 100, all of which are small except the 6 islands (Choiseul, New Georgia, Santa Isabel, Malaita, Guadalcanal, San Cristobal).

All these 6 islands are 80 to 200 km in length and 30 to 50 km in width and they form the major land portion of the country. The Guadalcanal Island is the largest among them, having the area of about 5,000 km<sup>2</sup> accounting for 1/6 of the total land area.

All islands have tropical oceanic climate. The rainfall varies according to the islands in the range of 2,500 to 4,000 mm (yearly average). The wind also varies according to the islands and seasons, but generally it is not faster than 3 to 5.5 m per second.

The capital of the Solomon Islands is Honiara, located in the northern shore of the Guadalcanal Island, with a population of about 18,000 (1980 census).

#### 2-1-2 Population trend

According to the census made in 1980, the total population in the entire Solomon Islands is about 230,000. The majority, more than 90%, is Melanesians, and the rest are Polynesians, Micronesians, Europeans, Chinese and others. Christianity is the most popular religion among the people.

Similar to any other developing countries, in the Solomon Islands population increase trend is quite prominent in the recent years due to the increase of birth rates and the decrease of mortality rates, and the current annual increase rate is about 3.4%. Needless to say, rapid population increase is detrimental to improvement of life standards. It is also considered that economical burden to employed people will increase due to the increase of the young population resulting from lower mortality rates of babies and recognition of the necessity of education.

When planning the improvement of life standards of the nation under such a population increase trend, it is essential that effective policies are enforced for the increase of food production, improvement of educational systems and expansion of employment opportunities. At present, there are substantial differences in the opportunities among provinces, and since employment opportunities for the rural people of working ages are very limited, there is a prominent trend of people migrating into cities.

### 2-1-3 Economy

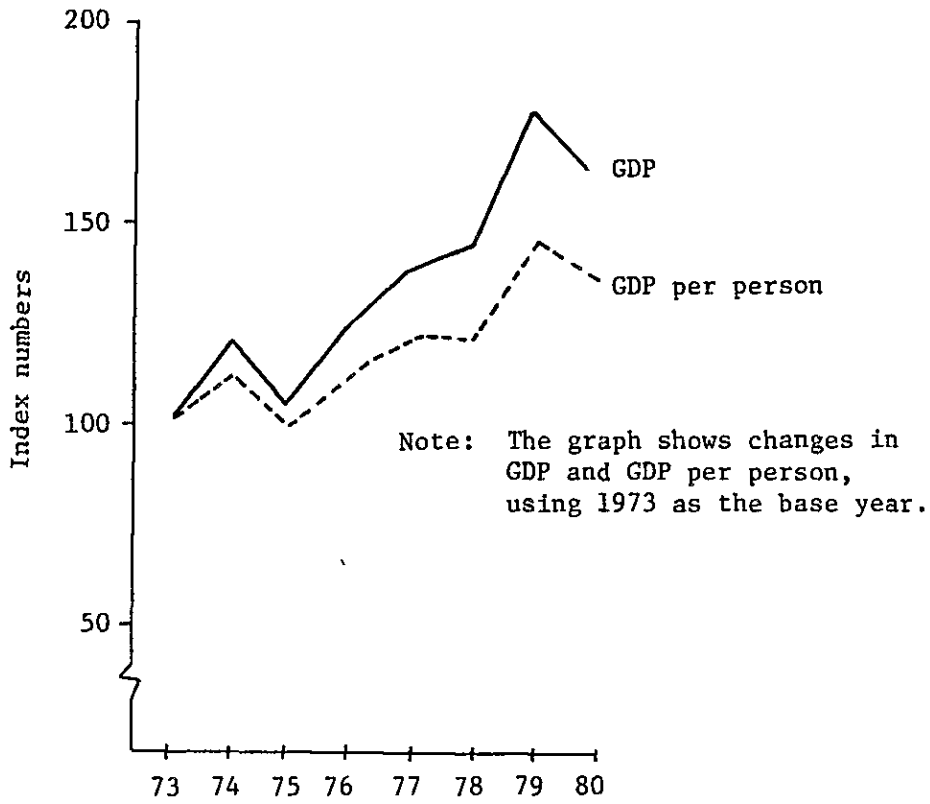
GDP (Gross Domestic Product) of the Solomon Islands is growing in the past several years, at an average annual rate of 7%, though 1975 and 1980 recorded minus growth from the preceding years. GDP of 1980 is 163% of that of 1973.

The major factors for the GDP growth are expansion of export and granted fund from foreign countries and other organizations. Copra used to be the only export item but the export operation was broadened to various items like lumber, fish and palm oil. The export destination countries have also been diversified.

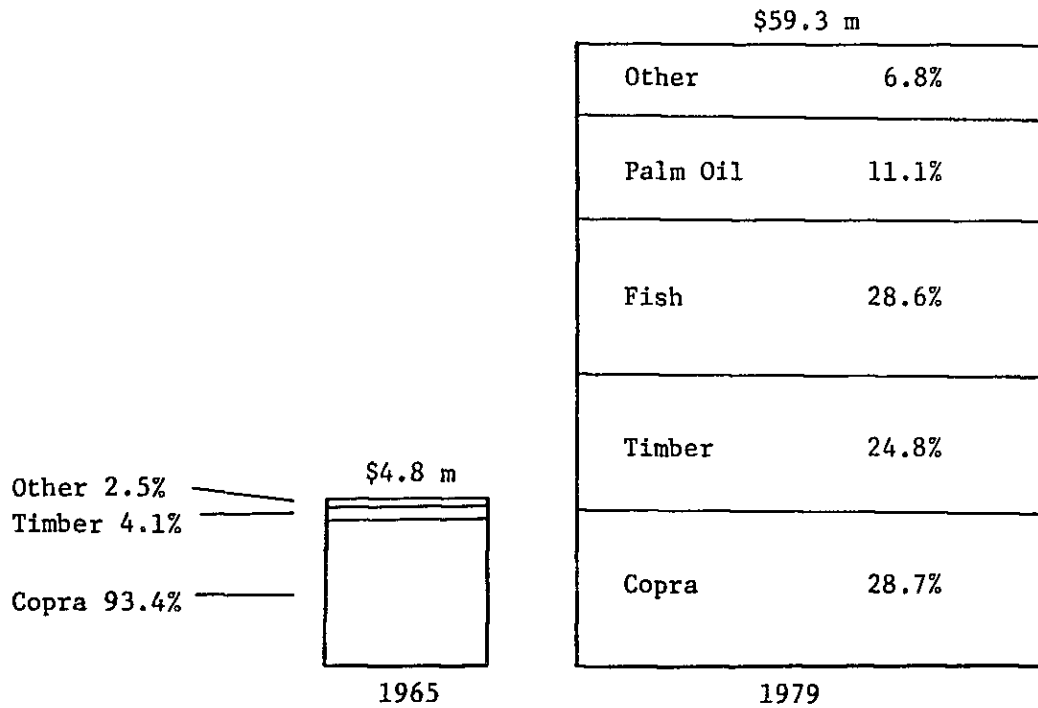
In spite of the GDP increase of the total quantity, when it is taken up as growth per capita, the growth is very little because of sharp population increase.

Another serious problem is that, though there has been some economical growth, the majority of the gain is not being returned to the nation but flows out of the country through foreign investors.

GDP and GDP per Person, Indexes 1973~80



Composition of Exports 1965 and 1979



The missions that the government has played in the course of economical development are that the budget for development projects was expanded (the 1980 budget was more than twice of that for 1975) owing to favorable monetary trend, though much of it was dependent to investment of foreign capitals, and actual industrial activities as been the largest enterprise in the country.

From the same viewpoint, for some time to come, the organ of the government will be monopolizing major parts of important industries and the development pace will be faster than that of the past years.

Based on the economical situation which has been described and in consideration of such anticipated low growth in the world economy, the Solomon Islands Government set a target annual GDP growth rate of 3% as the minimum to maintain the current living standard, and 5 to 6% for gradual improvement of the standard, by implementing the new development project.

It is difficult to exactly foresee economical growth rates because of the fluctuation of the prices of imported goods affected by inflation, trend of foreign capitals, population increase and change of production, etc. However, it is considered that in order to achieve the above target, it is essential to form a foundation for future development purposes.

Concentrated investment to a development project can be considered as a reliable and immediately effective means for economy growth. There are a few reasons for this; it helps to increase the productivity by growing talents and by introducing such necessary materials and equipment, resulting in greater profit due cost reduction, it adds higher values to products since these projects effectively use natural resources in the production, and it activates employment as more working opportunities are given.

In any event, at the current stage, the Solomon Islands Government must depend on help and commercial financing from overseas countries as the capital source.



## 2-2 Actual State and Development of Fisheries

### 2-2-1 Traditional fisheries

Small scale coastal fisheries have been practiced in units of rural tribe. 4 to 5 meter canoes, paddled by hands, are used to be engaged in trolling line or pole and line fishing of various species of fish with 2 or 3 persons in coral reefs up to several hundred meters from the coast.

Recently, the number of vessels of F.R.P. with small outboard engine is growing.

Since the catches were for self-consumption within the family or within the village, it has been difficult to determine the number of people engaged in this type of fisheries and the amount of catches.

Since the country consists of so many islands scattered over wide territorial sea and the population density is low without storage and distribution facilities, the fisheries remained in the traditional way up to recent years.

### 2-2-2 Fisheries development

The surveys made in the early 1970's showed availability of tuna biomass in commercial quantities and in 1973, the Fisheries Division was established in the Ministry of Natural Resources.

The Fisheries Division operates mainly promotion of rural fisheries, supervision and control of fisheries on commercial base and surveys of marine biomass.

In the beginning, emphasis was placed on the policy of fisheries by commercial base. However, because of abundance of fish resources, emphasis was also put to the development of rural fisheries activities in 1975, and since then the Fisheries Division has been operating these two measures.

Fisheries development on a commercial base started when Solomon Taiyo Ltd. (S.T.L.), joint venture between Taiyo Fishery Company, Ltd. of Japan and the Solomon Islands Government was established in 1973. S.T.L. is engaged in catching and processing of tuna in the Solomon Islands fisheries area.

The fisheries bases at Noro in Western Province and at Tulagi in Central Islands play very important parts of the government policies of the increase of cash income and employment.

A canning plant has been in operation at Tulagi since 1974.

In spite that migration of tuna varies year by year, tuna catches have rapidly increased and have reached 23,000 tons in 1980. The proportion of tuna to all the items of export is increasing both in quantity and amount of money. About 10% of tuna catches are exported as canned fish and majority of the rest as frozen tuna.

S.T.L. has proved to contribute to the Solomon Islands economy greatly in the following points:

- o Increase of income by export
- o Increase of employment
- o Increase of the Government revenue
- o Decrease of fish import (domestic sales of canned and frozen fish)
- o Purchasing of prey fish (increase of rural fishermen's income)

In 1978, the National Fisheries Development Ltd. (N.F.D.) was established by the Solomon Islands Government and S.T.L. It operates building of pole and line fishing vessels and fleet fisheries. Since it is not engaged in processing and sales, catches are sold to S.T.L.

Up to present time, N.F.D. has been engaged in construction of shipbuilding facilities, extension and improvement of repairing facilities, and construction of pole and line fishing vessels (one is completed and 4 is under construction). 2 years' fisheries activities shows great effect.

It is expected that S.T.L. and N.F.D. will continue to be the key feature in fisheries development on a commercial base. The joint venture contract terminates in November, 1982 and negotiation is being made for renewal.

At the same time, development of rural fisheries has increased cash income opportunities in rural areas, enabled training of village fishermen and increased the availability of fresh fish both in urban and rural markets. The development project of rural fisheries has been an integral part of the Solomon Islands' rural development program.

### 2-2-3 Development of rural fisheries

In 1975, an experimental project of supplying flake ice and insulated ice-boxes to fishermen began. Fishermen receive flake ice and in return send fish with ice to marketing centres (mainly to Honiara, the capital).

Since then the following three measures have been incorporated into the development program:

- 1) Installation of ice-making facilities and supply of insulated ice-boxes to rural fishermen
- 2) Development of marketing centres (including transportation facilities where necessary) and a guaranteed price scheme
- 3) Preparation for training programs of fishing technique and marketing organizations for fishermen

By 1980, 8 ice-making machines were installed and 123 insulated ice-boxes were supplied to fishermen. Moreover, marketing centres has been established in each province. They have been the core facilities for training and expansion program through the provision of sales channels to fishermen and installation of ice-making facilities. These marketing centres are operated by the Provincial Fisheries Officer attached to each province, together with assistant fisheries officers and support staffs. Some centres are large and well equipped but another majorities need to be improved.

In 1977, the Fisheries Division began implementation of training programs. The majority of the trainees are rural fishermen and Solomonese engaged in fisheries of commercial base.

Training of rural fishermen is carried out at 3 training centres on actual techniques of outboard engine, making and repairing of fishing nets, fish refrigeration and improvement of fishing techniques and management. The training program proved to be very effective and the candidate for training tends to exceed the capacity.

The Solomon Ia Company (SIACO) was established in 1977 to expand fish marketing outlets. SIACO's initial purpose was to provide retailing outlets in Honiara and carry out price policies effectively. Now, SIACO contributes greatly to developing rural fisheries by providing direct sales outlets, holding the price policies and supplying fresh fish steadily in Honiara, a large consumption market.

In 1979, SIACO began operating the refrigerated fish collection vessel donated by the Japanese Government. The vessel is engaged principally in transporting fish collected in Marovo Lagoon to Honiara. It plays an important part in improvement of fish distribution in the Western Province where the shortage of vessels is a bottleneck of fisheries development.

Based on the result of the development of rural fisheries, a long term plan was established for improvement of training programs, operation of ice-making and ice-utilization facilities, development of marketing infrastructures and price policies, and in 1981, a new development plan of rural fisheries began. It is difficult to estimate exact catches in the rural fisheries, but the quantity marketed through the Fisheries Division are shown in the next figure.

Quantity of Fish Marketed through Fisheries Division<sup>(1)</sup>

Year	Volume kg	Values (approx.) S.D. <sup>(2)</sup>
1977	13,374	8,024
1978	51,470	36,000
1979	97,346	82,744
1980	135,241	135,200

Source: Fisheries Division

Note: (1) Includes SIACO

(2) S.D.: Solomon dollar

#### 2-2-4 Problems for fisheries development

Current problems that need to be overcome to develop fisheries are outlined in the following.

##### (1) Fuel Cost

The increase trend of the fuel cost affects seriously both on commercial fisheries and rural fisheries. In the operation cost of S.T.L., expenses on fuel and lubricant occupy a large portion, and majority of cash expenditure in rural fisheries is on fuel for outboard engines. Therefore, S.T.L. is planning to replace their vessels to less fuel consumption type. In case of rural fisheries, paddle canoes have almost been replaced by boats with outboard engine and it is impossible to turn back to paddle canoes. The government has raised the tax on large outboard engine to spread small ones, and the Fisheries Division is studying the improvement of fuel efficiency.

(2) Information on Fish Resources

The lack of data about fish resources make difficult to utilize the resources sufficiently. Moreover, the target of fish catch needs to be set on smaller figures on the safer side.

(3) Training

While the needs for survey and supervision in fisheries have increased, Fisheries Division is not provided with enough staffs for the service. Therefore, much depends on foreigners now.

(4) Transportation

Undeveloped transportation facilities between fishermen groups and markets is the most disturbing factor for rural fisheries which aim at increase of cash income. Needless to say it is necessary that the Fisheries Division will continue to improve the transportation facilities; small coastal collection vessels and automobiles. It is also necessary to improve the inter-islands vessel services to spread the distribution of fish for all the islands.

#### 2-2-5 Fisheries development project

As of 1981, the Solomon Islands Government has the following five development targets:

- (1) Supervision on fish resources within 200 miles of the Solomon Islands to obtain the optimum catch for a long period of time
- (2) Stock surveys of coastal, oceanic and migratory fishes for supervision of fish resources
- (3) Development of small rural fisheries to increase domestic food and cash income
- (4) Increase of the domestic employment opportunity in the fisheries of commercial base
- (5) Self-sufficiency of fish in domestic market

On the promotion of rural fisheries, Fisheries Division has been pursuing following five development program:

- (1) Installation of ice-making facilities at important points.
- (2) Development of new fishing techniques to fishes which is not available now.
- (3) Development of marketing centres and appropriate and stabilized price structure
- (4) Preparation for training programs of fishing techniques and organizations of fishermen for distribution
- (5) Assist to fishermen on obtaining improved ice-boxes, fishing implement and related equipments

#### 2-2-6 Outline of rural fisheries development project

The project aims at increase of marketable fish catches in rural areas through the better utilization of fish resources, to give rural fishermen the opportunities for increase of cash income.

Actual measures are the following four items:

- (1) Furnishing of the necessary facilities to individuals or villages that are going to begin fisheries to be their occupation
- (2) Furnishing of hygienic and reliable fish marketing channels to activate fish marketing in rural markets and consequently to ensure rural inhabitants to take high quality protein sufficiently at proper prices.
- (3) Furnishing of public transportation facilities which can transport fish smoothly between fish landing sites and markets.
- (4) Construction of training centres needed for efficient implementation of training programs

Installation of the following facilities is being planned for this project:

Ice-making machine	20 sets
Provincial fisheries centre	8 places
Fish transportation vehicle	2 cars
Ice-box	500 boxes
Fish collection vessel	1 vessel

## 2-2-7 Outline of each province

The outline and development schedule of each province in the Solomon Islands are given below.

### (1) Malaita Province

Malaita Province has the largest population among the Solomon Islands and consequently demands for fish is large. Fisheries development up to present is limited to Auki and its vicinity in the northern part where the road network is fairly developed. In the southern part, because of undeveloped traffic system and lack of ice-making facilities, fresh fish cannot be supplied to the Auki market, but possibility of developing in this area is great. Because of taking too much time for transportation and lack of facilities especially for storage and marketing, fishery is not developing smoothly.

In Auki, a large scale and well equipped fisheries centre has been established which facilitated the work of the Provincial Fisheries Division, and it contributes to a remarkable progress in this area.

At present, there is a plan of constructing a substation to be the South Malaita fisheries development base in Afio. Afio was selected for the following reasons:

- 1) Large population in the suburbs (about 150,000)
- 2) Afio is the centre of South Malaita and installation of medical facilities and construction of roads are planned.
- 3) Afio has a completed water supply system.

### (2) Western Province

This province is blessed with abundant fish resources and marketing activities in the province have developed to some extent. It is possible to export freeze fish to Bougainville, but the difficulty is sorting of fish species and sizes, which is necessary to export.

There is a fisheries base in Gizo, the capital of the province, and has ice-making facilities, refrigerators, work shops and warehouses. Fisheries development is given a high priority in this province and the base needs to be extended to cope with the increase of operating, training and propagation activities.

Though there are many commercial boats serving between Honiara and Gizo, only one can carry frozen fish. A fish collection vessel is needed to improve efficiency of fish marketing. The vessel will regularly sail around the province, based at Gizo, and will carry fish to Gizo. If necessary, fish will be transported to Honiara from Gizo.

Installation of additional 7 ice-making machines for rural fishermen are recommended to go along with sailing of the fish collection vessel and also ice-boxes needs to be distributed.

The followings are outlines of each area in the province.

o Shortland Islands

Installation of an ice-making machine is scheduled in Fauro, the centre of this area, for marketing of fish in this area and transportation of fish to Gizo. It will be possible for surplus fish to export to Papua New Guinea.

o Choiseul - Choiseul Bay

This area is blessed with abundant fish resources and extra fish will be transported by fish collection vessels. Since there is no other basis of economical activities in this area, necessity of fish development is very high.

o Choiseul - Vaghina

Except for fisheries, there are not substantial economical activities in this area. Surplus fish are transported to Honiara.

o Vella Lavella

This area is blessed with abundant fish resources and is located closely to the Gizo market.

o Munda

Munda is the second centre of the Western Province and has a large population. There are abundant fish resources which can be utilized effectively if ice is available.

o Roviana Lagoon

Though there are abundant fish resources, they are not utilized because of unavailability of ice.



o Marovo Lagoon (Northern area)

There is one ice-making machine but because it cannot supply enough amount of ice, the northern edge can have no ice. Fisheries development started in 1976, but the progress had been slow due to lack of vessels until 1979, when a fish collection vessel donated by the Japanese Government began to collect fish in Marovo Lagoon and transport them to Honiara. The service of the fish collection vessel is very successful and now the current small scale fisheries base needs to be improved and extended. Also a plan is made to construct a base in Rama, the northern area, with facilities for training, marketing and accommodation for 2 staffs.

(3) Isabel Province

After various fisheries surveys had been conducted up to 1979, a fisheries officer was stationed and fisheries development started. At first, a small scale base was constructed in Tatamba and an ice-making machine was installed. There is a plan to construct substations in Kia and Kaolo, each of which will be provided with an ice-making machine and they will be engaged in marketing, training and propagation activities.

o Kaolo

There are abundant fish resources and many villages are scattered around Kaolo. If an ice-making machine is installed, marketing will be possible. There is a road connecting Kaolo and inland of south-west in the Isabel and this facilitates fish marketing. Regular sailing service is available in this area and it can be utilized for fish transportation to Honiara. Kaolo is given a high priority for development in Isabel Province.

o Kia

Kia has a population of over 1,000 and fish resources are abundant, but fish are consumed only by fishermen. If an ice-making machine is installed, fish can be sold locally and surplus fish can be sent to Buala, the capital of Isabel Province.

(4) Central Islands Province

At Tulagi, the Fisheries Officer made efforts in constructing the base and propagation of fisheries. Fisheries have already begun in Ngella and sometimes fish are transported to Honiara on canoes.

There is a plan to install an ice-making machine in Tulagi and to install a fisheries propagation centre and an ice-making machine in the Russel Islands.

o Tulagi

The fisheries extension staffs place the base at Tulagi, the capital of the Central Islands Province. Ice flakes are supplied by Solomon-Taiyo.

o Russel Islands

The fish resources are very abundant. The population is also large and demand for fish is substantial. It seems that fisheries will develop rapidly if an ice-making machines and propagation centre are installed.

Surplus fish can be transported to the comparatively near Honiara market on public or commercial sailing services.

(5) Guadalcanal Province

There is an ice-making machine of 2-ton a day capacity in Honiara, the capital of the Solomon Islands. All the ice made by this machine is consumed within Honiara, leaving little for other areas.

A small scale base equipped with an ice-making machine and retailing facilities was constructed in Marau in the eastern area, but it is not large enough now as much development has been made on fisheries since then.

Fish can be transported to Honiara from Marau using regular sailing services. There is a rough road from Marau to Avu Avu.

The weather conditions are not favorable in this area, causing damages to agricultural products, and people sometimes suffer from food shortage. Accordingly, demand for fish is great and vehicles are needed to transport fish within the island.

o Lambi Bay

The Lambi Bay is located at the west end of the road network and is a substation in this area. If an ice-making machine is installed here, ice flakes can be supplied to inhabitants on the coast from Lambi to Honiara.

o Avu Avu

Avu Avu is located in the south coast of the island and has a large population. Though there are abundant fish resources, because of unfavorable weather and lack of vessels, the resources have not been utilized sufficiently. If an ice-making machine is installed, it allows the people to engage in fishing in fine weather and to market fish even in bad weather.

(6) Makira/Ulawa Province

Ice-making machines and marketing facilities are in the Makira and Kira Kira fisheries bases and a fish collection vessel is sailing around these areas for collection and transportation of fish. Facilities for training and propagation are needed additionally. In order to increase the ice-making capacity, another ice-making installations are also planned in Kira Kira, Makira Harbor and Star harbor.

(7) Eastern Outer Islands Province

In 1980, fisheries propagation activities began. An ice-making machine was installed and enabled fish to be marketed, but facilities for fishing are still poor.

Enormous amounts of fish resources are available in this province, and if ice flakes is fully supplied constant marketing of fish is possible.

A base for training and propagation for fisheries is also needed.

2-2-8 Japanese aided facilities (Auki Fisheries Centre)

This centre has a boat repairing shop and engine training room with a small office between them. It stands by the seashore, together with a jetty and markets of rice, vegetable, meat and fish, to form the town core.

According to Mr. Stone, the counterpart, immediately after completion of the centre, the fish catches in the province have substantially increased, as a result, to stabilize fish prices. And then, the whole town of Auki have been very active.

Many fishermen are being trained in the centre based on annual training programs.

The building is well spoken of in general. However, one problem is that since it has no eaves and its windows are sliding type, during the rain they

don't open the windows in order to protect inside from the raindrop. Consequently, the inside will be very hot. In tropical areas, including the Solomon Islands, they use jalousie windows which are able to get ventilation during the rain.

## 2-3 Actual State and Development Program of the Inter-Island Vessels

### 2-3-1 Necessity of inter-island vessels

#### (1) Transportation of Men and Goods

Except for copra, timber and fish which are exported directly from the local ports of the production areas, the collection and distribution of goods is done through the port of Honiara as a transit point.

Exports and Imports at Honiara Port

Year	Imports (tons)	Exports (tons)	Total (tons)	Annual growth (%)
1976	58,453	17,298	75,751	
1977	60,468	30,415	90,883	20
1978	81,186	32,876	114,062	26
1979	84,850	50,622	135,472	19
1980	102,161	57,562	159,723	18

(Source: Solomon Islands Port Authority)

Major products of imports are rice, fuel oil, construction materials, and daily necessities. Some are consumed in Honiara, and the rest are shipped to the provinces where they are distributed to the villages. Therefore, the cargoes carried by the inter-island vessels should have increased year after year. However there are no statistics at all available of men and goods transported by inter-island vessels. The solomons government recognizes the necessity of the statistical data, but has not yet started the collection of such.

#### (2) Comparison of Sea and Air Transportation

Air transportation is relatively advanced as a means of linking the islands. Comparison of fare & rates from Horiara to Gizo shows:

	Travel time	Passenger fare	Cargo rate
Air	about 2 hrs.	81.30 S.D.	99 C./kg
Sea	about 40 ~ 50 hrs.	18. S.D. (for deck-passenger)	4.5 C./kg (45 S.D./ton)
Ratio:	(sea to air)	1/4.5	1/22

Thus, sea transportation is extremely advantageous for cargo transport. Passenger transportation by air is only used by government officials, businessmen, and tourists, according to a small standard income of Solomon Islanders.

## 2-3-2 5-year shipping program of the government of the Solomon Islands

The government of the Solomon Islands has drawn up a report for the promotion of the shipping industry for a period covering 1980 to 1984. The program is about to be implemented. It is targeted at attaining a nationwide shipping network as an independent nation.

It also describes the present situation and the goal of the country's shipping. The highlights are given below.

### (1) Current Shipping Capabilities

#### Solomon Islands Shipping Fleet 1980

Owner ship	No. of Vessels	Total Reg. Tonnage	Average Reg. Tonnage
Government	24	1,662	69
Solomon Islanders	57	795	14
Mission	19	400	21
Expatriate	41	4,594	112

(Source: Marine Division - MTC)

#### Total Passenger Capacity

	Outer Islands	Inner Islands	Coastal
Government	571	1,157	1,276
Solomon Islanders	nil	266	319
Mission	97	360	501
Expatriate	68	1,541	1,838
Total	736	3,324	3,930

(Source: Marine Division - MTC)

Note: These figures represent the total accommodating capacity when vessels are operated for each shipping route.

### (2) Selected Targets

Under this shipping development program, the priority is given to the following points:

- a. Improvement of the operating system of inter-island vessels (study the measures to improve the profitability of operation after obtaining the statistical data concerning the volume of transportation of men and goods).
- b. Replacement of overaged vessels.
- c. Improvement of port facilities.
- d. Modernization and improvement of productivity of the repair facilities of the Tulagi dockyard.
- e. Providing the safety measures in the sailing routes (building light-houses and removal of rocks & reefs).

The targets for implementation from year to year are as shown in the following table:

<p>1981 - commence inter-island shipping study</p> <ul style="list-style-type: none"> <li>- finalize designs for replacement inter-island vessels</li> <li>- completion of Honiara International wharf and facilities improvements</li> <li>- continue with navigational improvements</li> <li>- completion of wharf at Graciosa Say.</li> </ul>
<p>1982 - replace three inter-island vessels</p> <ul style="list-style-type: none"> <li>- complete inter-island shipping study</li> <li>- introduction of commercial accounting; identification and rationalization of subsidies; and organization improvements for management of Government fleet</li> <li>- commence improvements at Tulagi dockyard</li> <li>- completion of new inter-island jetties at Honiara</li> <li>- commence construction of new international wharf at Noro.</li> </ul>
<p>1983 - replace three inter-island vessels</p> <ul style="list-style-type: none"> <li>- completion of new facilities at Noro.</li> </ul>
<p>1984 - completion of improvements at Tulagi dockyard</p> <ul style="list-style-type: none"> <li>- replace three inter-island vessels.</li> </ul>

During the period of 1982 to 1984, 3 vessels are targeted to be replaced yearly with a total number of 9 vessels to be replaced during the whole period. The request for a grant to Japan this time forms a part of these development programs.

## 2-3-3 Government-Owned Vessels

### (1) Administration

The operation of government-owned vessels are utilized for following administrative necessity, and are not profitable under the present condition.

The purpose of operating the government-owned vessels is to provide for:

- a. Administrative shipping in the Provinces
- b. Cargo and passenger services where commercial services are inadequate
- c. Emergencies, evacuations, search and rescue

As for the administration of the government-owned vessels, some are controlled by the headquarters of the Marine Division, while others are assigned to the Provincial Assemblies or local governments and operated under their management. It was pointed out the vessels to be granted do not have yet any specific assignment as to the sailing route under the administrative policy of the Solomons government, although it has been decided that they would be used for inner-islands service.

### (2) Details of the Government-Owned Vessels

As the following table indicates, out of the 24 vessels listed, except for 4 landing crafts, and 2 survey boats, 18 vessels are assigned for general shipping. The size, age and designs of the vessels are all different. Over half of them are wooden vessels, and are more than ten years old (leading to high maintenance costs).

Year Material	'64	'65	'66	'67	'68	'69	'70	'71	'72	'73	'74	'75	'76	'77	'78	'79
Steel vessels			1						1							4
Wooden vessels	1	3	1		1	2	1	1			1				1	

The vessels to be replaced under this program are the 2 units of L class wooden vessels (built in 1965 and 1966) listed under Nos. 9 & 10. These 2 vessels are currently assigned to the shipping routes in Western Province and Isabel Province, but one of them was under repair at the time of our investigation. We investigated one of them at the Tulagi



dockyard. The equipment of the vessel was very poor and water leakage from the bottom was noted. We judged the vessel as unusable.

( See photographs in DATA SECTION )

List of the Government-Owned Vessels (1)

No.	Ship Name	Type	Hull Material	Built	Tonnage	No. of Passenger	Bag Copra	Where Posted
1	BARUKU	Pass & Cargo	Steel	U.K. 1979	224.05	II C OT 89/106/80	140 t	Western Province
2	BELAWA	" "	"	"	224.05	"	140 t	Malaita outer island Pr.
3	BETUA	" "	Timber	Rabaul 1965	107.5	82/82/60	94.8	Makira Province
4	BILIKIKI	" "	Steel	Japan 1966	110.3	120/120/79	1,300 Bags	Central Pool
5	BONA	" "	"	Japan 1972	88.28	109/109/56		" "
6	BULAWA	" "	"	Japan 1979	199.51	89/106/80	140 t	Guadalcanal Province
7	BUTAI	" "	"	"	199.51	"	140	Eastern Island Province
8	KWAI	" "	Timber	U.K. 1964	70.89	60/60/60	12 t	Central Pool
9	LANALAU	" "	"	Australia 1966	49.2	36/40	31.25	Western Province
10	LAUMOA	" "	"	Australia 1964/65	47.6	34/54	31.25	Isabel Province
11	VALI	Landing Craft	Steel	Australia 1975	61.6	12/20	---	Central Pool
12	VITU	" "	"	U.K. 1976	72.59	20/20	---	" "
13	VELA	" "	"	Australia 1976	31.79	10/10	---	" "
14	VARU	" "	"	"	31.79	10/10	---	" "

List of the Government-Owned Vessels (2)

No.	Ship Name	Type	Hull Material	Built	Tonnage	No. of Passenger	Bag Copra	Where Posted
15	WAGINA	Pass & Cargo	Timber	S.I. 1974	39.85	II C. 10/10	12.5 t	Central Pool
16	WALANDE	"	"	S.I. 1965	40.0	36/40	12.5	" "
17	WATERO	"	"	S.I. 1978	37.8	36/40	12.5	Central Island Province
18	WANGO	"	"	S.I. 1970/71	40.84	25/36	12.5	Makira and Ulawa
19	WAIMASI	"	Cement	U.K. 1968	21.35	34/39	Pass only	Central Pool
20	WAINONI	"	Timber	U.K. 1969	28.79	12/17	3.12 t	" "
21	WAROKAI	"	"	U.K. 1969	25.9	18/20	3.12 t	" "
22	WAISISI	"	"	S.I. 1969/70	43.1	55/55	31.25	Western Province
23	WAKIO	Survey	Cement	S.I. 1972/73	37.17	15/15	--	Central Pool
24	WALO	Fish Res.	"	U.K. 1978	49.09	12/20/10	--	" "
	(TULAGI	Patrol Boat	Steel	Australia 1979	45.19	12/12/10	--	" " )

Notes: No. of Passenger

II means in case of Inner island route

C means in case of Coaster route

OT means in case of Outer island route

## 2-3-4 Facilities related to shipping

### (1) Port Facilities

At the important points of each island are simple jetties and the water is deep, and mooring is no problem. However, cargo handling off the shore will be necessary at most of the villages scattered in the islands. The sea route is sufficiently deep except some areas with reef and the general sea state is about grade 3. The navigating conditions are considered good. ( see photographs in DATA SECTION )

### (2) Repair Facilities

There is a dry dockyard belonging to the Marine Division in Tulagi. The dock has 2 shipways. The larger unit is capable of pulling up 300 weight tons with the maximum width of 8.5 m. There is an engine overhaul shop, a woodworking shop, an electric & machine shop. There is a testing area for a life raft, and a warehouse.

There are 5 foreign managers and 150 local workers. Therefore, there are no problems for repairing of inner-island vessels from viewpoints of facilities and technics, except in special repairing jobs. However, materials and spare parts are difficult to obtain, and they are all imported except wood. We must give due consideration to the supply spare parts for the vessels to be provided. (see photographs in DATA SECTION)

### (3) New Ship Building Facilities

NFD (National Fishery Development) is building a ferro-cement vessels for their own use in their shipyard in Tulagi. There are not enough workers and also their skill seems not to be enough yet. There are other shipyards where ship's carpenters are working on a 15~20 meter long wooden cargo boat. Anyhow, it would still take a long time before the shipyards could build proper new ships. Local production of FRP canoes using imported materials is quite advanced.

We observed quite a number of FRP canoes with out-board engines (mostly Japanese) in use.

### (4) Seamen Training Facilities

There is the Honiara Technical Institute, a high-grade educational facility of the Solomons. There are a number of schools in the institute.

A specific educational training is given in each of the schools. The seamen receive training at the Marine Training School of the Institute and become deck officers (the maximum accommodating capacities of the school are 18 for the lower-ranking seamen course with a 6-month training and 20 for the higher-ranking officers course).

Students receive their education at the Engineering School to become engineers of ships. Judging from maintenance conditions of the vessels observed in this time, crews seem to have reached the certain level.

Aside from the above-said courses, the Institute offers commercial school, survey and draughting school, & building school.

### 2-3-5 About the vessels previously provided

Two vessels Bulawa and Butai provided by Japan in 1980 have been extensively operated with the former vessel put in service in the province of Guadalcanal and the latter in the province of Eastern Island, with no serious troubles reported, as a means of transportation in the Solomon Islands and are enjoying high popularity there.

On August 21, in Auki we inspected the vessel Belawa provided by Britain, and on August 22, in Honiara we inspected the vessel Bulawa provided by Japan. ( see photographs in DATA SECTION )

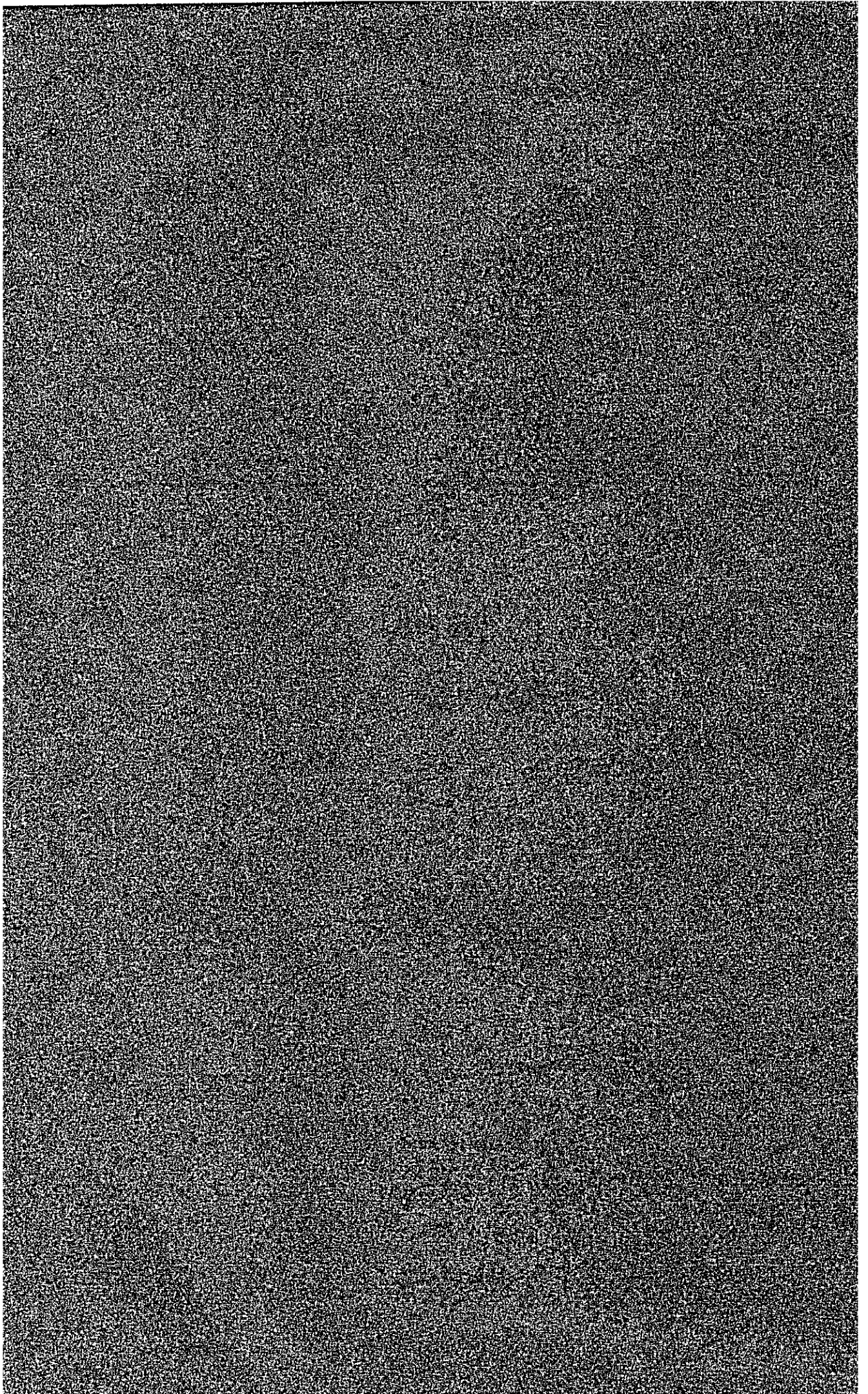
The crew's comments on Bulawa are as follows:

- a. The cargo handling gear has been hydraulically operated including the boom slewing gear, thus making cargo handling work easier. While on the other hand Belawa has been equipped with manual operation for the boom slewing.
- b. The vessel has less rolling in the navigation.
- c. The vessel has a wider wheel house so that the operation of the equipment is easier.
- d. The hollow metal door of the vessel are weak against tropical weather, besides becoming rusty. A strong wooden door would be better.

It was observed that the maintenance condition of the vessel and the engines was excellent.



**CHAPTER 3**  
**BASIC DESIGN**





## CHAPTER 3 BASIC DESIGN

### 3-1 Fisheries Centre

#### 3-1-1 Outline and basic policy

The fisheries centres are to be built as the core facilities of fisheries development in each province based on the rural fisheries development project. They are complex buildings containing various functions needed for development of rural fisheries.

The main functions are training of fishermen and fish marketing. Additionally, the centres will make themselves the headquarters of fisheries development in rural areas.

The main rooms and the use are outlined below:

#### (1) Training Room

Fishermen in a group of 10 to 20 will take training from the first step of fisheries.

#### (2) Marketing Area

Fish catches will be collected from the local area to be sold to consumers on the spot. Also, an ice-making machine will be installed to supply ice flakes to fishermen's ice-boxes.

#### (3) Office

It is the office space for rural Fisheries Officers to execute development project of rural fisheries and manage the fisheries centre.

#### (4) Fishermen's Room

It is the accommodation for rural fishermen to stay for training.

#### (5) Accommodation

It is the living space for volunteers (Assistant Fisheries Officers) who will be engaged in the training of rural fishermen. Since the state of housing in the islands is very poor, it is necessary for fisheries development.

The fisheries centres are to be designed under the following basic policies:

- (1) All functions of the facilities requested by the Solomon Islands Government shall be reflected clearly into the plan, and at the same time the plan shall be flexible enough to take care of the future needs of fisheries development which has just begun.
- (2) Taking into account the conditions of the construction sites, materials of the frame work and main components shall be selected to lessen the site work. However, lumbers and other materials available in the islands shall be used, if possible, to promote wood and other industries in the islands.
- (3) Type, materials and construction method of the building shall be suitable for the local conditions taking into account the natural conditions, way of life and construction method of the Solomon Islands.

### 3-1-2 Construction sites

The Solomon Islands Government is planning to build new fisheries centres or extend and improve the centres principally one in each of 8 provinces. This time, the following 4 sites have been selected according to the priority determined by the Solomon Islands Government:

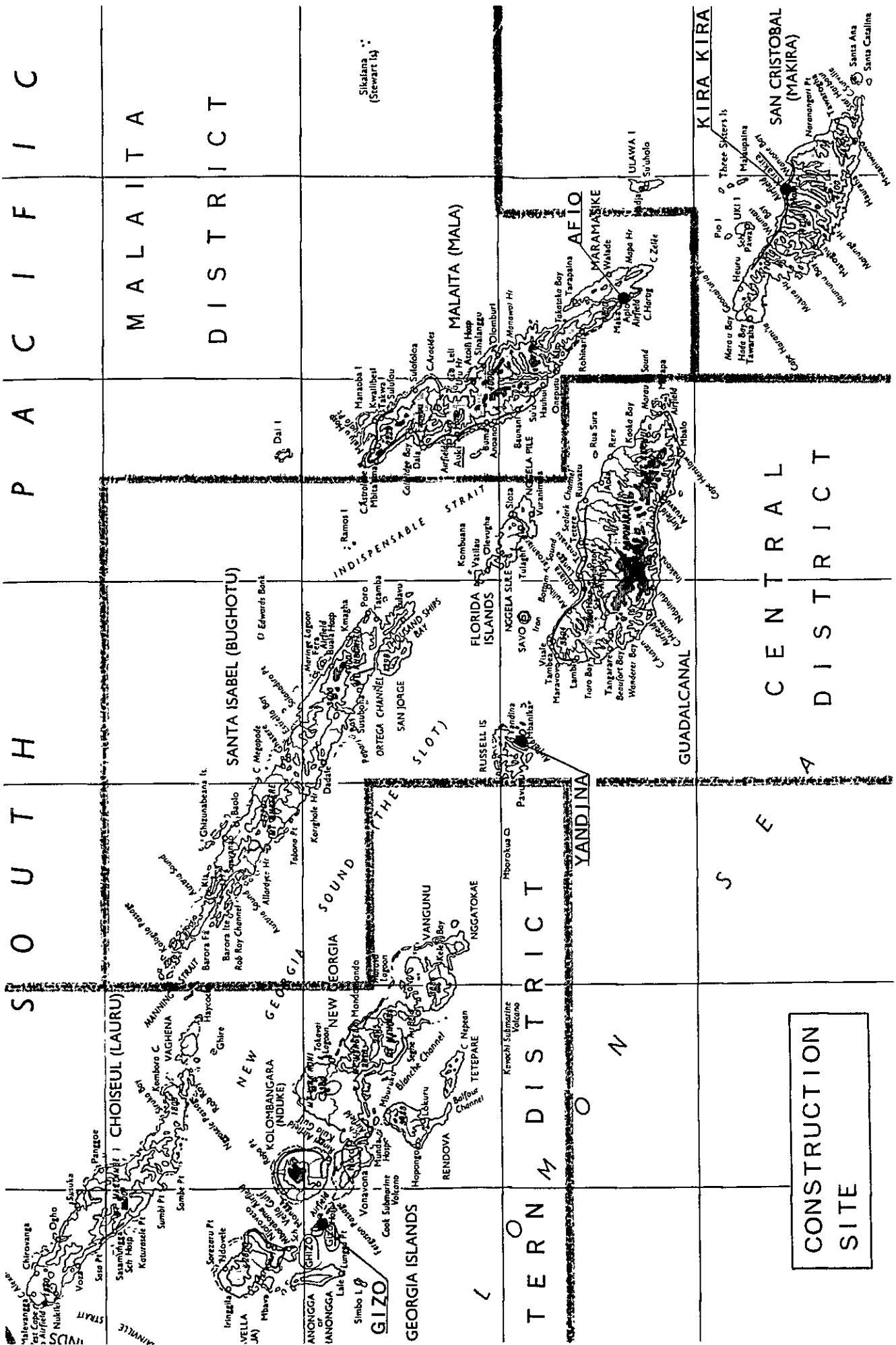
- (1) Afio, Small Malaita, Malaita Province
- (2) Gizo, Western Province
- (3) Kira Kira, Makira/Ulawa Province
- (4) Yandina, Central Islands Province

Outline of these 4 sites and the reasons for selection are given in 2-2-7.

In Gizo, the scheduled site for the fisheries centre is away from the town and the location is not favorable for a market. There is a existing maketing area in about the half way between the town and scheduled construction site.

In Kira Kira, there is a marketing area in the scheduled construction site.

On these 2 places, the existing marketing areas are to be continuously used, and marketing facilities will not be included in the fisheries centres to be constructed.



Sikalana  
(Stewart Is.)

MALAITA  
DISTRICT

KIRA KIRA  
SAN CRISTOBAL  
(MAKIRA)

CENTRAL  
DISTRICT

TERN DISTRICT

CONSTRUCTION  
SITE

### 3-1-3 Site situation and layout plan

- Afio : The site is excellent since it faces a small bay and protected from the wave of outer sea by a small breakwater. The site is large enough but the road needs improvement. The centre will be built in parallel to the coast and close directly to the sea.
- Gizo : The site faces the sea. It has large depth but the width is not enough. A centre will be built in the full length of the width in the reverse "L" layout with the existing building. It has own pier and one can walk to the seashore from the road through the service area of the building.
- Kira Kira: The site is away from the seashore by 30 to 40 metres and is on a completed trunk road. The fisheries centre will be built in parallel to the road. The existing marketing area are to continue to function.
- Yandina : The site is adjacent to a pier, to which large vessels can directly anchor, customs office and post office, and is well prepared. It faces directly to the sea, and revetment works will be need, after construction of the fisheries centre. The centre is planned carefully not to affect the customs office and post office.

### 3-1-4 Architectural plan

- o The shape of the centre will be simple taking into account the flexibility for various use, easiness of construction and weathering efficiency.
- o In order to protect the inside from the heat and to relieve the fish odor, the ceiling level will be high enough to give a larger air space and ventilators will be set at necessary point.
- o In order to get ventilation effectively. It will have a rectangular shape to be provided with windows on the walls of opposite side in each room.
- o In order to get ventilation during the squall, all windows will be the jalousie type (adjustable glass louver) and eaves will be projected from all sides of the buildings. The eaves will protect the outside walls from the raindrop, and especially it will improve the durability of the foot of building.

o It will be constructed on reinforced concrete foundations with steel frame of posts and beams. Reinforcement against horizontal force will be made by braces.

### 3-1-5 Construction method and materials

The fisheries centres will be constructed on reinforced concrete foundations with steel frames. The roof will be made of folded plate and the outside walls pre-coated galvanized steel sheet panels. All these components will be manufactured in Japan, only to fabricate in the sites for the following reasons:

- (1) To keep the constant level of construction work while local labors are employed in at each site.
- (2) To shorten the period of site work, and consequently reduce the construction cost.
- (3) Investigation results of the Japanese aided Auki Fisheries Centre which was constructed in almost same the way.

Interior walls and ceilings will not be lined, except in accommodation. The floor will be finished by mortar trowel to enable to be washed by water. The floor in accommodation will be made of wood in order to promote the local lumber industries and to keep dwelling ability.

### 3-1-6 Equipment plan

- Policy : To make equipment system simple for easy and less expensive maintenance.
- Water supply: A water supply service exists in all sites. Water will be supplied from the existing pipes.
- Drainage : Sewage will be disposed of by penetration into the earth, directly as to general sewage and through septic tank as to sanitary sewage.
- Electricity : Electricity will be supplied by the generator for the ice-making machine. The voltage is 240 V in single phase. Fluorescent lights suspended from ceilings will be used.
- Gas : Propane gas in bombs will be used to supply to kitchen ranges.

### 3-1-7 Furniture plan

Each fisheries centre will be provided with necessary items out of the equipment and furniture in the following list:

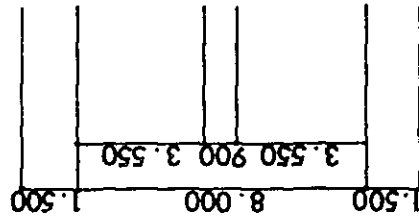
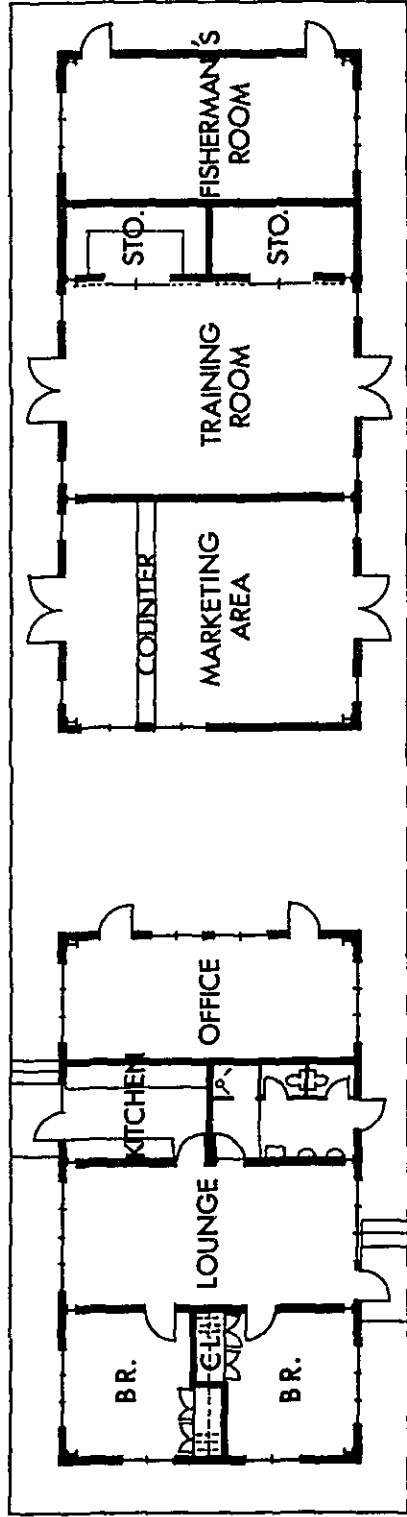
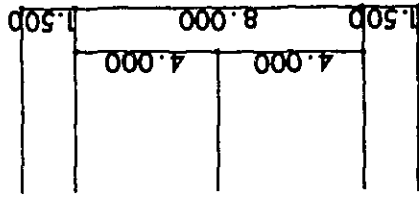
Marketing Area	
Sales counter	1
Built-in shelving	1
Ice storage bin	1
Storage cupboard	1
Pan scale 0 ~ 6 kg	1
Desk top calculator	1
Fish carrying baskets	12
Training Room	
Equipment cupboards	2
Wall blackboard	1
Office	
Office desks	2
Office chairs	2
Kitchen	
Kitchen unit	1
Lounge	
Bookcase	1
Bed divan	1
Dining table	1
Chairs	6
Bed Room (each)	
Built-in wardrobe and shelving	1
Chest of drawers	1
Bed with mattress	1

Wooden furniture will be used as much as possible and they are to be manufactured in the Solomon Islands to promote the wood industries.

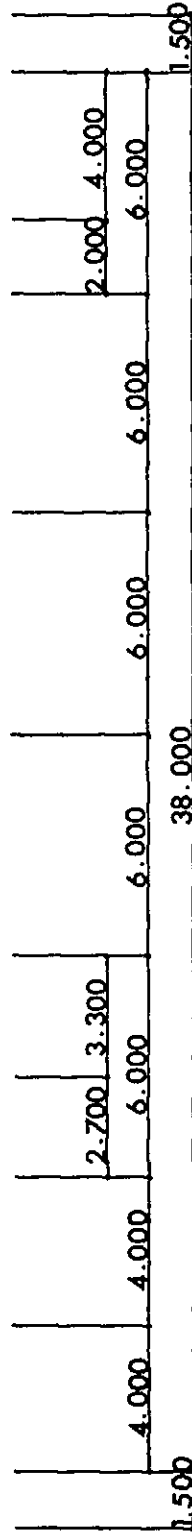
3-1-8 Preliminary drawings

PLAN	(AFIO/YANDINA)
ELEVATION & SECTION	(AFIO/YANDINA)
PLAN	(GIZO/KIRA KIRA)
ELEVATION & SECTION	(GIZO/KIRA KIRA)





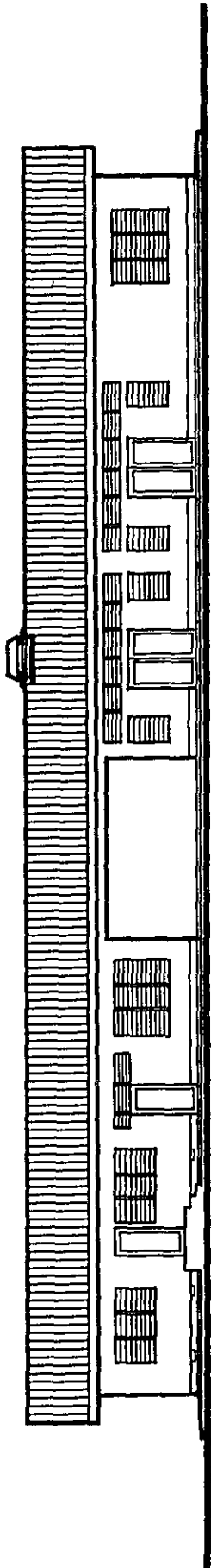
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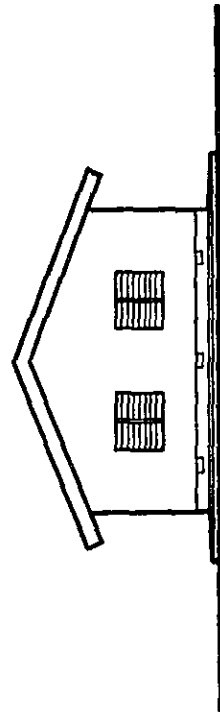
PLAN 304 m<sup>2</sup>

( AFIO / YANDINA ) SCALE 1 / 200

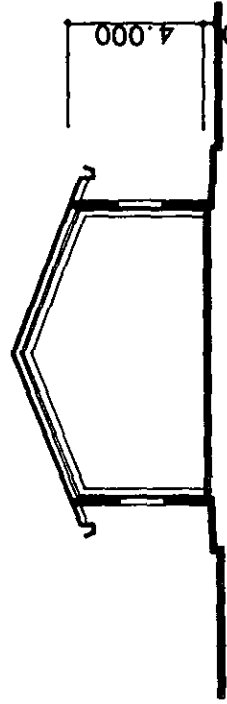




ELEVATION

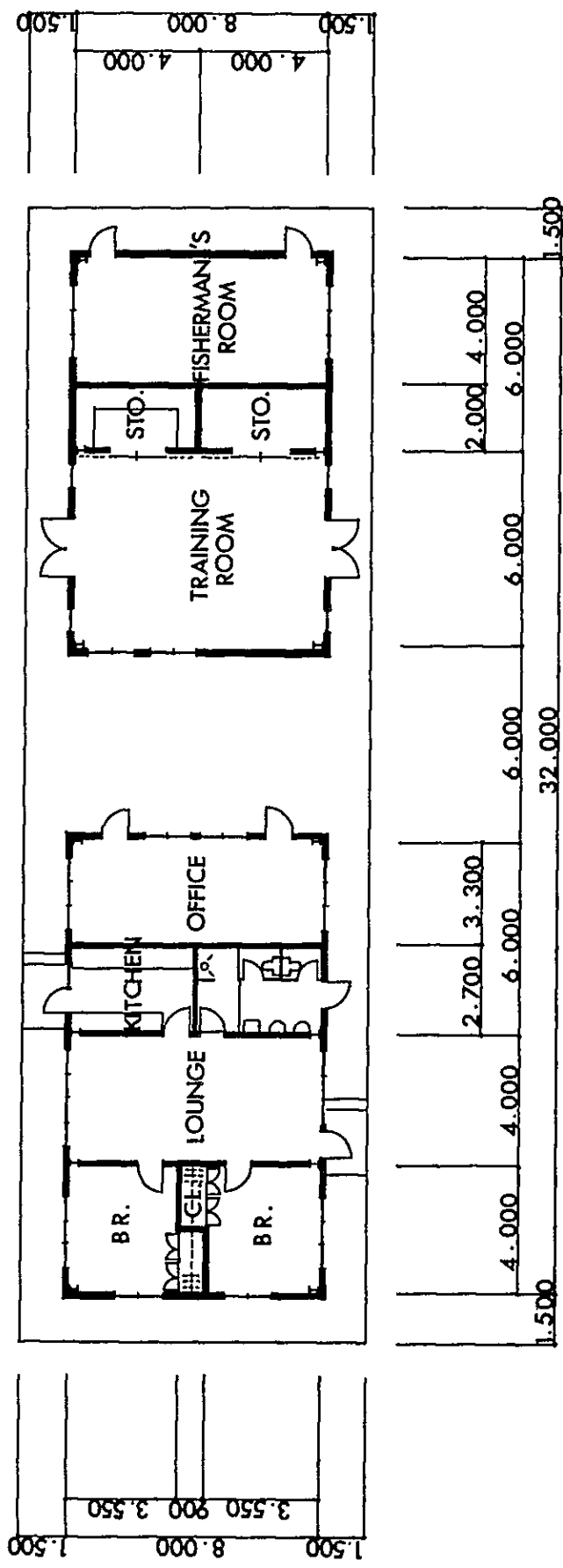


ELEVATION



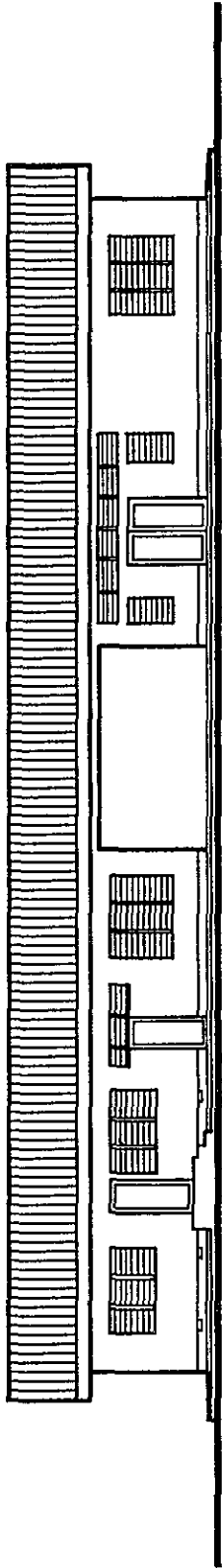
SECTION

( AFIO / YANDINA ) SCALE 1 / 200

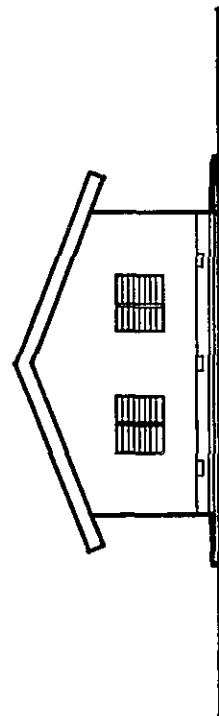


PLAN 256 M<sup>2</sup>

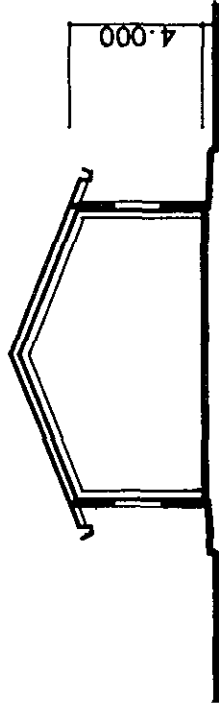
( GIZO / KIRAKIRA ) SCALE 1 / 200



ELEVATION



ELEVATION



SECTION

( GIZO / KIRAKIRA ) SCALE 1 / 200