

1.2 Fish Marketing Facilities and Related Infrastructure

(1) Fish marketing facilities

- 1) The condition and facilities of the markets in Honiara and the issues which need to be resolved have been delineated in section II.1.7.3 in the chapter on General Conditions. The town council has formulated the following plans to develop the markets and to resolve the issues confronting each marketplace.

a. Honiara Town Council Development Plan, 1982-1992

In accordance with the development strategies pursued by the national and provincial development plans, the following plans were formulated by the Honiara Town Council, the Town Planning Division of the Ministry of Agriculture and Land, the Economic Planning Agency, and the National Planning Division.

- Current issues

Of the three markets of Rove, Kukum, and Honiara Central Market, the Honiara Central Market in particular, needs to be renovated since its close proximity to the Town Center and its limited land space is the source of traffic congestion.

- Proposals to renovate the markets

In order to resolve the problems confronting the Honiara Central Market, proposals to move the market to a larger area or to transfer its functions to other areas, without moving the market from its present location have been made.

Another proposal is to build new markets in the Naha and White River districts in order to meet the needs of this growing community.

b. Honiara Town Council Programme of Action Four Year Development Plan, 1990-1993

Unlike the large-scale development plans of the town, this programme was implemented to resolve immediate problems. Programmes currently implemented under the town budget or small-scale projects are not included in this development plan. The annual development plan of the town is formulated yearly in January and programmes which will be implemented for

that year are deliberated at that time. A summary of the programme which is being implemented for the market is given below.

- Proposals to implement market renovations
 - Improve the market vegetable and fish selling areas and the parking area to meet current needs.
 - Improve the roof and facilities of the Rove Market.
 - Build a new Kukum market with subsidies.
 - Select and procure land for the new markets in Panatina and White River and secure funds to build new market facilities.

c. Final Plan on upgrading the Rove Market (1993)

This project was requested by the Ministry of Agriculture and Land and contains many past proposals to improve the market. They are summarized below.

- The need to establish Rove Market as a satellite market
 - Rove Market can be utilized more conveniently by the area's inhabitants as a satellite market.
 - It can function as a supplementary market during the peak hours of the Honiara Central Market.
 - The market's objective is to reduce the cost and commuting time of its users around the Rove Market area.
- Improvements to provide comprehensive market functions
 - Comprehensive satellite market functions which will not impede RSIPF use of the harbor on the adjacent west side of the market place will be established.
 - The shore will be filled in and harbor construction will be implemented in order to effectively utilize the market's land area and to protect the coastal area. Plants will be cultivated along the shore as protection against the wind and to provide shade.
 - A road running in front of the market will be built and a parking lot will be provided to improve safety conditions and market functions.
 - A public toilet about 200m on the west side of the market will be built for market users.
 - Installation of a market roof: All vegetable and fruit stalls will be roofed (20m x 10m).
 - A rest area and benches will be provided for customers.

- Drainage facilities for rain water will be renovated.
- Stalls selling cooked food will be expanded to 16m x 19m.
- New fish stalls will be built (foreign aid is under consideration).
- Installation of lighting facilities within the market compound: Lights will be installed within the market compound to provide safer conditions at night.

2) Honiara Central Market activities

a. Honiara Market survey

The activities of the market, the volume of produce handled, the number of retailers, customers, and motor vehicles were surveyed according to the following methods.

- Date of survey: Saturday, Oct. 16 and Wednesday, Oct. 13

- Volume of produce handled

The survey was carried out by three survey teams. In the early morning hours (12 midnight on Saturday, 3 A.M. on Wednesday morning) the load of each vehicle arriving at the market was weighed and counted separately according to kind.

- The number of retailers using the market was determined based on the number of receipts issued for market license fees which are paid on a daily basis by retailers.

- Number of people entering the market

A gate was set up at the market entrance and the number of people entering during the operating hours of 6 A.M. to 6 P.M. were counted on an hourly basis.

The people entering the market were counted and divided into customers and general entrants.

- The number of vehicles entering the market

Vehicles entering the market during operating hours were counted hourly according to type.

b. Activities of Honiara Central Market

The location and survey findings on market activities are given in Fig. 1.2.3. and Tables III.1.2.1, III.1.2.2 and III.1.2.3. Current market activities are given below.

- Entrants to the market mainly use the entrance and exist point for vehicles located on the left side of the market and the central entrance on the right hand side of the market. A few people enter and leave via the coastal side of the market.
- There is only one entrance and exist point for cars and trucks which is congested during peak operating hours.
- Much of the produce is carried in by retailers on the weekends and half of the parking space is taken up by retailers selling their produce there.
- Fish is sold at the nearby fish landing site on the coast.
- As shown in Fig. III.1.2.3, the northeastern area of the market contains ice cream and food shops which impede market access and they have created a low activity area.

c. Volume and type of produce handled and its origin

The volume of produced handled at the market on a weekend (Saturday) and a weekday (Wednesday) are shown in Table III.1.2.1. The total volume of produce handled on the weekends was 82.3 mt which was approximately four times greater than the weekday volume of 20.8 mt. The weekend meals of Honiara residents are larger than meals on weekdays. The volume of fruits handled on the weekend was 56.4 mt, about 3.7 times larger than the weekday volume of 15.1 mt; the volume of root crops was 14.0 mt on the weekend or 4 times greater than the weekday volume of 3.5 mt; and the volume of leafy vegetables was 11.9 mt on the weekend and 5.4 times higher than the weekday volume 2.2 mt.

However, there was no great difference in the ratio of fruits, vegetables, and leafy vegetables transacted on the weekends and weekdays. The ratio of fruits averaged between 69 and 72 percent of the total produce volume handled; root crops comprised 17 percent; and leafy vegetables averaged between 11 and 14 percent. The ratio of fruits consumed by Honiara residents did not differ greatly between weekdays and weekends.

Coconut was the highest volume of fruit handled at the market and comprised about 36 to 44 percent of the total handling volume of fruits. This was followed by watermelon at 6 to 9 percent.

The handling volume of kumara was also high, comprising 66 to 71 percent of the total handling volume of root crops. Cabbage comprised 33 to 37 percent of the total handling volume of leafy vegetables. This was succeeded by Chinese cabbage at 16 to 27 percent.

Most of the produce coming into Honiara originate from the eastern and western areas of Guadalcanal Island. Only a minimal volume is brought in from Western and Malaita Provinces by regular cargo/passenger ship and it is usually brought in by passengers for personal consumption.

Approximately 65 to 74 percent of the vegetables, including leafy vegetables, sold at the Honiara Central Market are brought in from the level plains of eastern Guadalcanal Island and only 26 to 35 percent originate from the hilly western area. In contrast, about 48 and 52 percent of the fruits originate from the east and western areas of the island, respectively (Table III.1.1.3).

d. Retailers

The largest group of retailers at the Honiara Central Market are produce sellers who number about 303 daily, followed by frozen fish retailers who average about 28 daily. The smallest group is the fresh fish retailers who number only 15 per day.

As shown in Table III.1.2.3, the number of retailers at the market is the greatest around payday at the middle or end of the month.

The number of produce retailers at the market average 197 on weekdays and increase to 484 on weekends which is about 2.5 times higher.

In contrast, fresh fish retailers at the market are affected by weather and production conditions. Irrespective of the weekend, their numbers at the market range from a maximum of 32 to a minimum of 7 people.

Unlike the fresh fish retailers, the frozen fish retailers each utilize a freezer chest at the market which enables them to adjust their handling volume for the day. The number of frozen fish retailers is greater on pay-days and on weekends: and their numbers range from 37 to a minimum of 10 people.

e. Number of people entering the market

Surveys on the number of people entering the market was implemented on two Saturdays. Approximately 20,000 general entrants were counted in the

first survey (Table III.1.2.4). It was determined that the market also served as a social gathering place and there were many general entrants intermingling with customers. As a result, only customers were surveyed in the second survey and approximately 11,000 customers were counted (Table 1.2.5). Subsequently, it was concluded that only one half of the entrants were customers.

As shown in Table III.1.2.4, more than 2,000 entrants per hour were counted from 10 A.M. to 4 P.M. This figure peaked to 2,800 from 1 P.M. to 2 P.M., underscoring the popularity of a Saturday market day. In Table III.1.2.5, more than 1,000 customers per hour were counted from 7 A.M. to 2 P.M. which indicated that customers arrive about three hours prior to the most congested time period of the market. The highest number of customers, about 1,400, was counted from 8 A.M. to 9 A.M.

f. Number of vehicles entering the market

As shown in Table III.1.2.6, there were approximately 2,200 vehicles entering the market on Saturday. Produce was transported by truck, pick-up truck, and mini-van. The number of trucks entering the market from 6 A.M. to 7 A.M. was double that of other hours. Vehicles transporting goods into the market were concentrated during the time period of 6 A.M. to 2 P.M.

More than 100 private cars and taxis were counted from 7 A.M. to 2 P.M. which coincided with the time period when a high concentration of customers were present.

(2) Ice making and refrigeration facilities

There are two ice plants in Honiara Town which produce 3.5 mt of ice per day. One company supplies about 80 percent of the ice requirement in fisheries sector and another company supplies 20 percent. The ice produced by both plants is block type and the quality is not very good. Their price is SI\$0.34/kg in comparison to the NFD price of SI\$0.11/kg. The only refrigeration facilities available are owned by the three firms engaged in processing and export and they are only -20°C, 30 to 50 ton refrigerators.

(3) Processor/exporter

There are presently three firms engaged in fish processing and export. All three possess refrigeration facilities and they freeze and fillet process the fish for export. However, fish supply is insufficient and unstable and they are hampered in their operations.

(4) Marau Fisheries Sub-center (Guadalcanal Province)

This Sub-Center was established by the provincial government in 1978 and renovated with EC assistance in 1990. Presently, its operations are under the supervision of the EC.

(5) Lambi Fisheries Center (Guadalcanal Province)

This center was built in 1984 with Japanese government assistance. However, the center is presently not in operation due to a breakdown of its ice-making machine. It is currently being used as an elementary school facility.

(6) Yandina Fisheries Center (Central Province)

This center was built through Japanese government assistance in 1984 and it was renovated under EC assistance in 1990. Presently, its operations are under EC supervision.

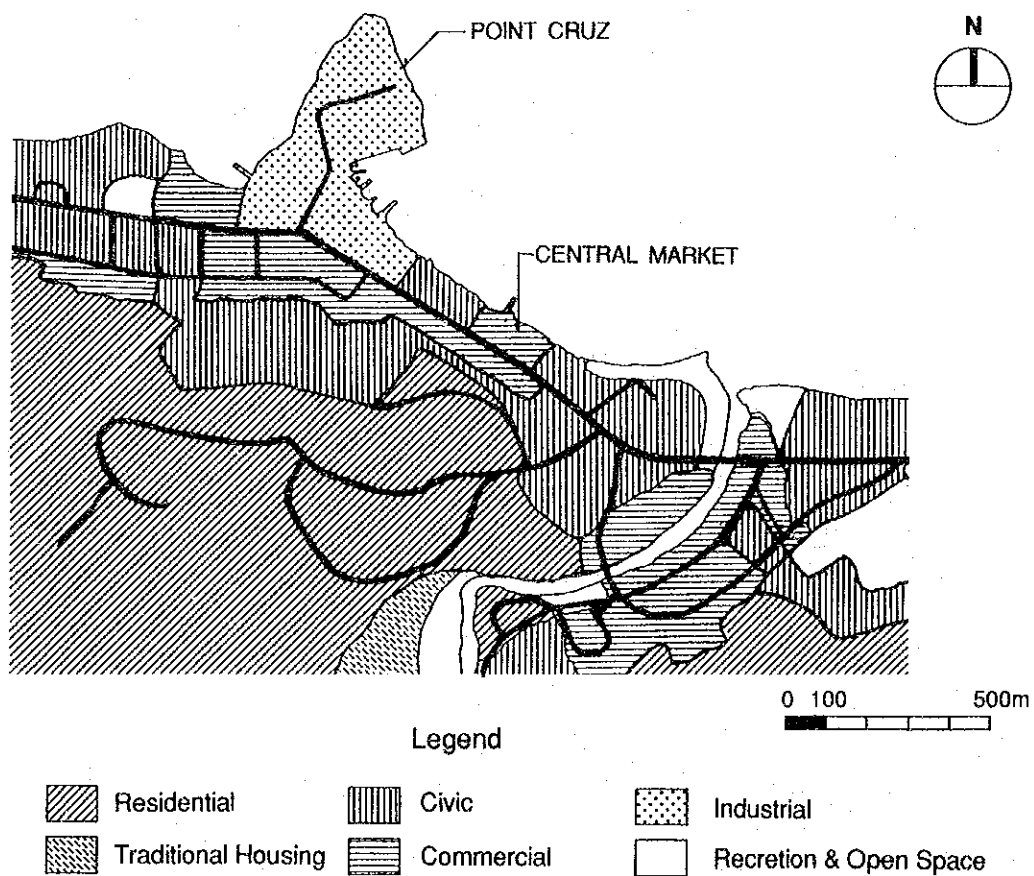
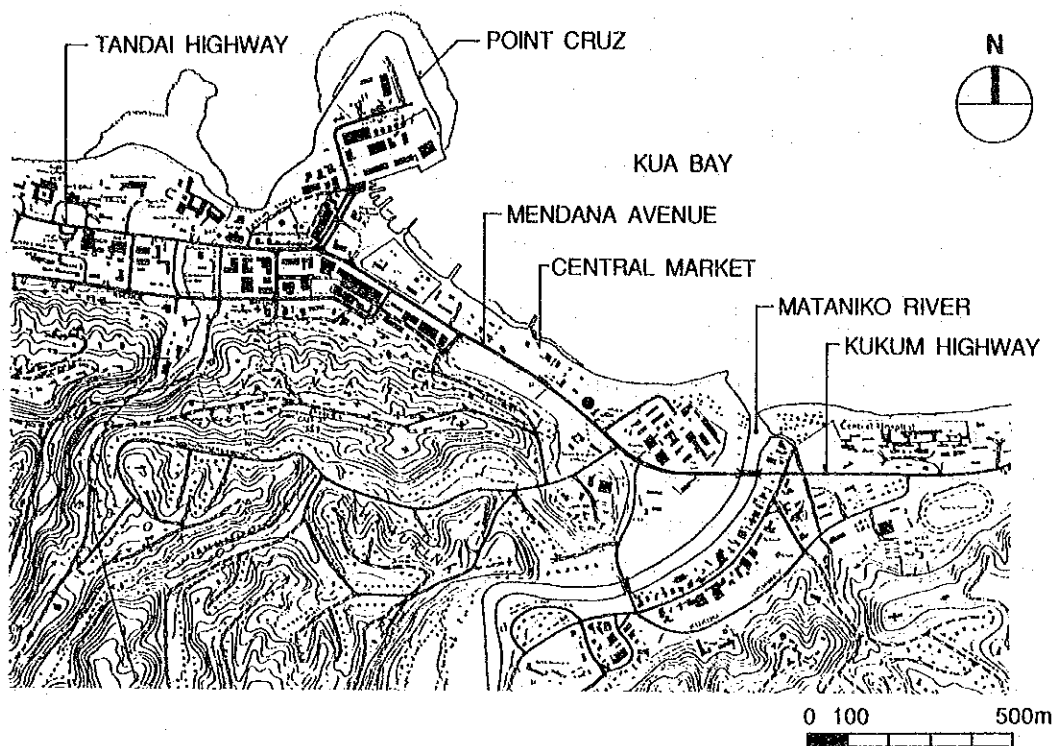


Fig. III.1.2.1 Proposed Land Use Zoning Plan by Ministry of Agriculture and Lands for Honiara Central Area

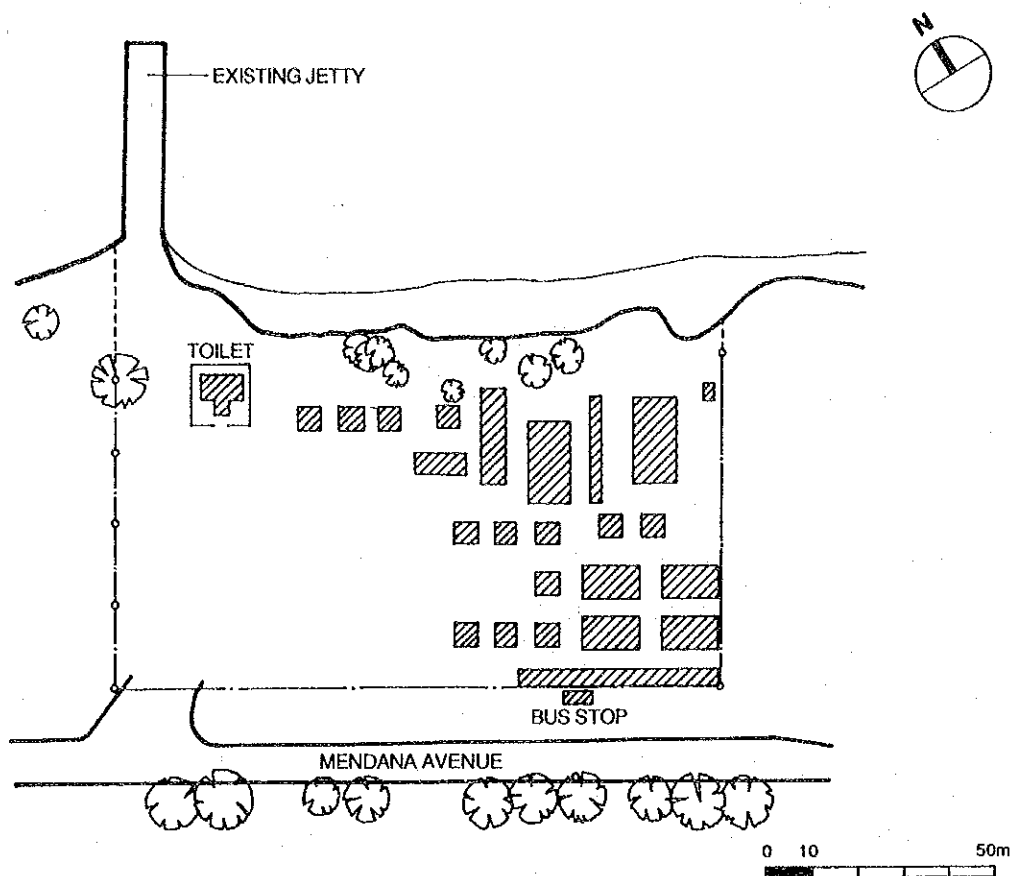


Fig. III.1.2.2 Existing Layout of Honiara Central Market

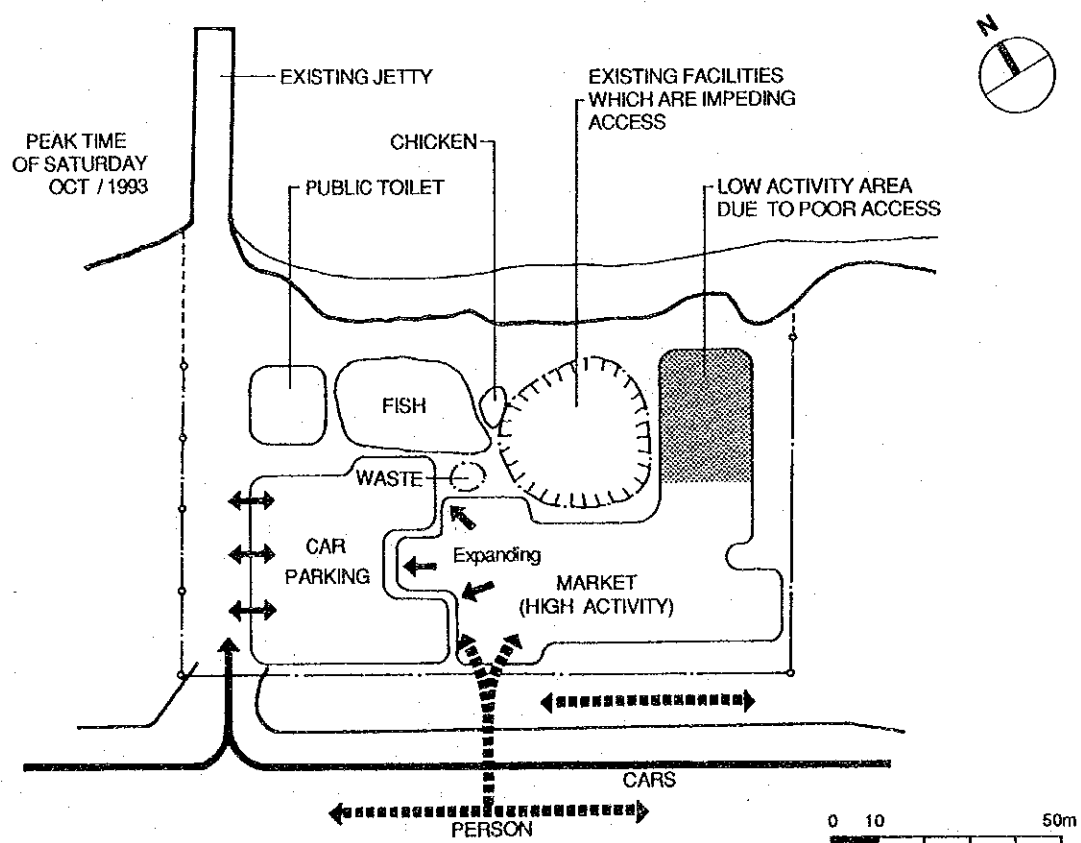


Fig. III.1.2.3 Existing Condition of Market Activity of Honiara Central Market

Table III.1.2.1 Handling Volume of Vegetable/Fruit in Honiara Central Market

Unit:Kg											
Fruits	Coconuts	Banana	Beans	Citrus	Melon	Pepper & Chillie	Tomatoes	Pine-apple	Sugar cane	Others	Total
13-Oct	5,403	480	226		1,411	97	703	3,306	302	3,181	15,109 (73%)
16-Oct	24,785	2,991	598	465	3,599	314	3,012	3,557	3,584	13,526	56,431 (69%)
Roots	Kumara	Kassava	Taro	Pana	Yam	Others	Karot	Peanuts			Total
13-Oct	2,306	621	151				120	287			3,485 (17%)
16-Oct	9,983	990	302	347	1,100	1,263					13,985 (17%)
Foliage	Local Cabbage	Chinese Cabbage	Ferms	Oven	Others						Total
13-Oct	730	600	50	229	584						2,193 (11%)
16-Oct	4,454	2,287	1,559	1,874	1,721						11,895 (14%)
Cumulative Total											TOTAL
13-Oct											20,787 (100%)
16-Oct											82,311 (100%)

Remarks: Market survey conducted from 2:00 AM to 12 Noon on 13 Oct. (Weekday) and 16 Oct. (Weekend).

Source: Market Survey (The Dev. Study on Improvement of NFMS in Solomon Islands, 1993)

Table III.1.2.2 Origin of Fruits/Vegetables in Honiara Central Market (1993)

Unit: %			
Category	Origin		Total
	Eastern Part of Guad.	Western Part of Guad.	
Fruits	48	52	100
Roots	74	26	100
Folliage	65	35	100

Source: Market Survey (The Dev. Study on Improvement of NFMS in Solomon Islands, 1993)

Table III.1.2.3 Number of Retailers in Honiara Central Market (1993)

Unit: Persons

Date	Day	Retailers		
		Veg./Fruits	Fresh Fish	Frozen Fish
27-Sep	Mon	351	16	50
28-Sep	Tues	338	22	45
29-Sep	Wed	336	23	41
30-Sep	Thu	364	24	39
1-Oct	Fri	373	15	37
2-Oct	Sat	484	7	32
3-Oct	SUN	0	0	0
4-Oct	Mon	197	7	30
5-Oct	Tues	287	6	29
6-Oct	Wed	285	8	20
7-Oct	Thu	211	5	15
8-Oct	Fri	263	12	17
9-Oct	Sat	362	8	19
10-Oct	SUN	0	0	0
11-Oct	Mon	203	14	10
12-Oct	Tues	277	10	15
13-Oct	Wed	302	14	12
14-Oct	Thu	286	16	15
15-Oct	Fri	384	31	20
16-Oct	Sat	478	16	31
17-Oct	SUN	0	0	0
18-Oct	Mon	201	8	30
19-Oct	Tues	214	16	31
20-Oct	Wed	245	12	29
21-Oct	Thu	258	14	31
22-Oct	Fri	262	15	31
23-Oct	Sat	409	16	33
24-Oct	SUN	0	0	0
25-Oct	Mon	220	15	30
26-Oct	Tues	256	21	33
27-Oct	Wed	324	24	23
28-Oct	Thu	209	32	25
Total		8,491	427	773
Average		303	15	28

Source: Market Survey (The Dev. Study on Improvement of NFMS in Solomon Islands, 1993)

Table III.1.2.4 Number of People Visiting and Marketing at Honiara Central Market

Unit: Persons

	Main Gate	Gate-1 (Seaside)	Gate-2	Gate-3	Gate-4	Gate-5	Total
6 - 7 AM	351	38	363	180	165	101	1,198
7 - 8 AM	282	73	557	277	347	55	1,591
8 - 9 AM	441	66	445	268	130	297	1,647
10 - 11 AM	646	68	519	193	290	474	2,190
11 - 12 Noon	400	77	332	645	255	526	2,235
12 - 1 PM	277	77	234	371	291	160	1,410
1 - 2 PM	702	106	451	233	519	804	2,815
2 - 3 PM	239	83	791	284	548	535	2,480
3 - 4 PM	435	35	250	562	441	735	2,458
4 - 5 PM	252	56	300	211	130	201	1,150
5 - 6 PM	185	114	234	54	153	33	773
Total	4,210	793	4,476	3,278	3,269	3,921	19,947

Remarks: Market survey conducted on Dec. 23/1993 (Saturday) from 6:00 AM to 6:00 PM.

Source: Market Survey (The Development Study on Improvement of NFMS in Solomon Islands, 1993)

Table III.1.2.5 Number of People Marketing at Honiara Central Market

Unit: Persons									
	1	2	3	4	5	6	7	8	9
	Sea side	Side Bus stop Gate	Pedestrian Crossing	Parking (W)	Parking (S)	Parking (N)	Parking (E)	Main Gate	Total
6 - 7 AM	17	83	88	75	88	47	316	83	927
7 - 8 AM	32	130	144	153	74	111	275	76	1,133
8 - 9 AM	37	173	215	225	90	140	204	92	1,419
10 - 11 AM	25	299	271	195	53	108	94	180	1,379
11 - 12 Noon	84	183	286	256	56	71	93	87	1,338
12 - 1 PM	96	324	174	287	45	53	39	66	1,232
1 - 2 PM	89	499	286	150	31	47	42	32	1,292
2 - 3 PM	38	242	85	122	47	39	18	30	768
3 - 4 PM	60	158	134	137	35	21	27	23	745
4 - 5 PM	38	141	152	120	17	19	22	18	598
5 - 6 PM	17	57	21	33	8	3	9	5	171
Total	533	2,289	1,856	1,753	544	659	1,139	692	11,002

Remarks: Market survey conducted on Dec. 23/1993 (Saturday) from 6:00 AM to 6:00 PM.

Source: Market Survey (The Development Study on Improvement of NFMS in Solomon Islands, 1993)

Table III.1.2.6 Number of Vehicles by Type Entering Honiara Central Market

	Cars	Taxis	Pick-up Vans & Mini-Bus	Trucks & Lorry	Total
6 - 7 AM	52	55	36	100	243
7 - 8 AM	50	96	30	55	231
8 - 9 AM	44	106	62	37	249
10 - 11 AM	38	108	51	30	227
11 - 12 Noon	31	150	31	44	256
12 - 1 PM	29	102	26	48	205
1 - 2 PM	74	167	42	68	351
2 - 3 PM	14	35	70	27	146
3 - 4 PM	23	48	10	24	105
4 - 5 PM	16	45	14	24	99
5 - 6 PM	23	34	12	22	91
	394	946	384	479	2,203

Remarks: Market survey conducted on Dec. 23/1993 (Saturday) from 6:00 AM to 6:00 PM.

Source: Market Survey (The Development Study on Improvement of NFMS in Solomon Islands, 1993)

2. PRESENT CONDITION OF MODEL ZONE 2

This zone encompasses the Florida Islands lying opposite to Honiara.

2.1 Fish Marketing System

(1) Socio-economy of coastal villages

1) Geographical conditions

The Florida Islands are located approximately 50km northeast of Guadalcanal Island. They are composed of the islands of Big Gela, Small Gela, Sandfly Island, Buena Vista, Tulagi Island containing the capital of Central Province, and about 50 other large and small islands. They comprise a total land area of about 390km².

The interior of the principal four islands contain low hills (less than 40 to 400m), but the smaller islands are elevated atolls which are flat without any hills.

There are about 70 villages scattered throughout the islands, but with the exception of a few villages situated along rivers, the majority are located along the coast. All of the islands and villages are located within a radius of 50 to 70km from the capital of Honiara and they can be reached within one and a half hour to three hours by FRP boat.

2) Population

Tulagi Island, containing the provincial capital, is blessed with a good natural harbor equipped with wharf facilities and easy access to Honiara. In addition, due to the presence of National Fisheries Development Limited (NFD), the large-scale commercial fishing industry, Sasape Marina, the shipbuilding yard, provincial government offices, etc., the island has a large population of salaried workers which has created the only consumer society in the Florida Islands. However, the scope of consumption is modest, due to a small population of approximately 2,400 (1992).

The total population of the islands, excluding Tulagi Island, was estimated to be about 10,000 in 1992. There were about 1,520 households, with seven people per household. On the average, one village unit was comprised of 21 households.

3) Social structure

Villages were usually composed of one to eight clans; and land was jointly owned by these clans.

Nearly all of the villages were located on the coast and their livelihoods were based on subsistent fisheries and agriculture. Village life was spent divided between fishing and farming. Excluding rice, canned food, noodles, and other imported or processed foods, the staple and supplementary diets were subsistent. Due to their close proximity to the capital of Honiara, a monetary economy was widespread.

4) Agriculture

Root crops such as sweet potato, yam, taro, etc., vegetables such as tomatoes, cabbages, egg plants, etc., and fruits such as bananas, papayas, watermelons, etc. are cultivated. Only a small segment of these crops are sold at the outdoor market of the provincial capital of Tulagi, whereas crop cultivation for the majority of the villages remain at subsistent levels (only a few villages sell their crops in Honiara as a means of earning cash revenue).

The principal cash crop is copra, but production volume is low due to a limited area of only 27km² of land suitable for coconut cultivation and undeveloped facilities such as wharves and jetties (the 1986 production volume was only 339 mt and only 3 percent of the total production volume of the province. The average maximum production volume per household was 0.2 mt).

5) Fisheries

Fresh fish production and marketing are the most effective means of earning cash revenue; and as a result, the fishing activities of the inhabitants are the most active among all the other provinces. Although the majority of the fishermen are engaged in subsistent fisheries, it is estimated that the potential fishing population is about 3,000 (two people per household).

Fishing activities may be carried out individually in dugout canoes or in groups, as in the case of net fishing. Group members are usually relatives. Joint activities between different family groups are the source of disputes, particularly when money is involved, and for the present such activities are difficult to implement.

Although there are no professional fishermen engaged in full-time fishing operations, a common practice among the fishermen is to purchase the fish catch of others, in addition to their own, and transport it to Honiara to market. It is anticipated that eventual professional fish transport services as well as fisheries will evolve, in conjunction with a developed fish market in Honiara.

NFD, the large-scale commercial fisheries company in Tulagi, produce frozen tuna and skipjack. It supplies about half of the nation's export volume and domestic demand for frozen fish.

(2) Fisheries resources and production

1) Fishing grounds

a. Buena Vista Island

The eastern coast is unsuited to landing fish and there are few villages located here. It is also unsuited for petty fisheries as well. In contrast, the northern coast which faces Isabel can be utilized in fishing operations by both islands. However, it is necessary to secure the safety of the fishing boats.

The southern coast which contains Soso is surrounded by hills in the north and the east. The western coast is cut off by an island and contains many reefs which make it an ideal fishing ground for harvesting shallow sea fish.

The population of the west coast is small and there is no fishing base. However, there are many shoals and seaweed in the waters surrounding Naghotano Island, containing numerous deep sea, demersal fish which make it ideally suited as a fishing base.

b. Sandfly Island

The northeastern coast is often buffeted by bad weather and reef areas are narrow with very few reef fish. Although it is believed that numerous demersal fish exist in its offshore waters, fishing operations using currently available methods and boats are unsuited for production in these waters.

Siru, Tumbila, Olevugha on the western coast are protected from northern and eastern winds by inland hills. Although there are no reefs, there are abundant fishing grounds for deep sea demersal fish (30m-50m), due to numerous shoals and seaweed on the bottom of its offshore waters. Shoal fish of rock and banks are abundantly harvested in the eastern coast which borders Sandfly Channel, due to its numerous reefs.

c. Big Gela Island

- West Coast

Mereka Togha near the west entrance to the Sandfly Channel is blessed with both reef and outer ocean fishing grounds, but due to minimum fishing efforts, production has been nominal.

However, Haleta which borders outer ocean fishing grounds containing numerous shoals and seaweed in its offshore waters, is an ideal fishing ground for deep sea bottom dwelling fish; and a large volume of high priced fish can be harvested in the right areas. It is closely located to the Honiara markets and its development potential is high.

The waters of Volo Halavo and Mbola are highly brackish; and the fish inhabiting their coasts are low priced brackish fish.

- East Coast

Although the east coast is at a disadvantage due to the Utuha Channel which places it at a greater distance, Vura and Anuha are rich fishing grounds abundant in demersal fish which swim in the offshore current of the reefs. However, the number of fishing operations are restricted due to the numerous seasonal storms.

d. Small Gela Island

Small Gela Island is a triangular shaped island whose base lies in the southern coast. Its western slope has a high brackish water content with very limited fish and its eastern slope contains reefs that make it unsuitable for docking. In addition, there are many storms and development of the fishing industry is restricted.

Fishing by small canoes is difficult in the eastern half of the southern coast which is affected by the strong ocean currents of Nggela Channel and the powerful winds characteristic of the Solomon Islands.

Although the western half suffers from the same conditions, there are reefs at Ghumba where its offshore waters contain numerous shoals and seaweed, providing wide fishing grounds.

2) Major fish species

Reef fish is scarce and pelagic fish such as grouper, emperor fish, job fish, red snapper, demersal fish such as king fish, trevally, bonito, yellowfin, and fish inhabiting offshore waters such as mackerel, sardines, and sea mullet are harvested.

3) Fishing methods, gear, and boats

The majority of the fishing boats are single seat dug-out canoes. Fishing methods which are employed are line and pole and occasionally gill and throw nets are used.

4) Resources

Presently, fisheries in the Florida Islands are restricted to subsistent levels. However, with the development of a monetary economy, fishery resource management will become necessary.

(3) Fish marketing structure

1) Fresh fish transport and marketing patterns

The fresh fish marketing patterns of the Florida Islands are shown in the Fig. III.2.1.1.

In the Florida Islands, the producers directly transport and market their fish catch to the consumption areas which is characteristic of fish marketing activities in this area. Nearly all of the villages transport their fresh fish to Honiara and sell it directly to consumers (Table III.2.1.1 & Fig. III.2.1.1). Although the number of groups per village differs, there may be one to seven groups per village that are involved in fresh fish production, transport, and marketing activities; and it is estimated there are approximately 105 of such groups throughout these islands (based on interview surveys carried out in the field and at the provincial Fisheries Center).

This practice of direct transport and marketing of fresh fish from the Florida Islands was started in Honiara Town in 1977; and with the bankruptcy of the fresh fish wholesaler, in May 1985, the practice gradually became widespread.

Fresh fish transport and marketing groups from Florida Islands not only sell the fish catch harvested by their group, but also purchase the fish catch of other villagers in cash, and transport them in eskies to the Honiara Central and Rove Markets.

The transport and marketing methods employed by each of these groups can be divided into the following three categories shown below. Of the four, the most common method which characterizes the transport/marketing pattern to Honiara is type A (Fig. III.2.1.1).

- Type A: Fish is transported by privately owned boat or FRP vessel and sold independently in Honiara.
- Type B: Fish is transported by chartered FRP vessel and sold independently in Honiara.
- Type C: Fish is transported by passenger/cargo ship running regularly from Tulagi and sold independently in Honiara.

2) Marketing pattern of frozen fish

The marketing pattern of frozen fish in Central Province is shown in Fig. III.2.1.2. The National Fisheries Development Ltd. (NFD) is the second commercial tuna fishing and processing company in Solomon Islands. In 1992, NFD supplied 415 MT of frozen fish to Honiara. There are two agents and a number of retailers who directly purchase from NFD. The two agents based in Honiara purchase frozen fish for retailers in Honiara and transport it using their vessels. The retailers purchase directly from NFD and transport the fish using their FRB boats. NFD does not transport frozen fish to Honiara. In Honiara, the retailers keep the fish in temporary storage using chest freezers at homes and sell the fish directly in the markets.

(4) Origin/destination volume of fish products

The origin/destination of fresh fish marketed to Honiara from Florida Islands is shown in Table III.2.1.1. Florida Islands consist of Sandfly, Buena Vista, Big Gela and Small Gela islands. The fishermen of these islands are the main suppliers of fresh fish to Honiara. Of the total supply of 1,000 mt of fresh fish in 1992, 210 mt (21 percent) were supplied to Honiara and 790 mt (79 percent) were consumed locally.

NFD, the commercial tuna fishing and processing company situated in Tulagi (Big Gela), is a source of frozen tuna for the Honiara markets. In 1992, it supplied 415 mt of frozen tuna which was directly purchased by agents and retailers.

(5) Fish marketing cost structure

Generally three types of fresh fish marketing patterns from Florida Islands to Honiara exist based on the mode of transport. Type-A fishing group uses their own FRP boat, Type-B fishing group uses chartered boat and Type-C fishing group uses the ship at Tulagi. Type-A is the most common type of marketing. Each type involves fish collection, packing and transport.

A cost analysis of the three types of marketing was carried out and summarized in Table III.2.1.2. The cost for fish collection and packing is estimated to be same. The cost for fish collection is fish purchase at about SI\$2.50/kg and the use of three trays of ice (SI\$5/tray of 45 kg of ice). Packing cost involves only two trays of ice for transport. The cost of about SI\$275 per esky of 100kg fresh fish does not vary for the three types of marketing. The only variable cost is the transport cost. In Type-A, the transport cost is about SI\$108 for fishermen using their own boat. The transport cost for Type-B using chartered boat is SI\$200 and SI\$142 for Type-C. The total expenditure of marketing an esky to the market is SI\$383 for Type-A, SI\$475 for Type-B, and SI\$417 for Type-C. Hence, the marketing cost for Type-B is SI\$91 more than the Type A. Type-C costs SI\$34 more than Type -A.

In terms of the sale cost in Honiara, the one-day sales expense is about SI\$20, i.e. the market fee collected by the Honiara Town Council, and in the case of two-day sales, the sales cost is SI\$50 which includes the market fee for ice (half block), and overnight storage.

The current market price of fresh fish in Honiara varies from SI\$3.50 to SI\$4.00/pound. The sales revenue of one esky of 100kg of fresh fish is estimated at SI\$770. The profit margin of one esky of fresh fish from the Florida Islands ranges from SI\$367 for Type-A, SI\$333 for Type-C and SI\$275 for Type-B. Therefore, the profits from Type-A marketing pattern is higher than the other two types.

(6) Sea transport system

Regular transport services running between Tulagi and Honiara are provided three times a week on alternate days by one passenger/cargo ship. Although there are two ships available, the one stops only once a week via Auki. Each ship has a passenger accommodation capacity of about 30 which is usually full; and a cargo capacity of three to four tons. Cargo volume is normally 80 percent of capacity. The transport capacity for fish is four eskies per ship; and a maximum of only 16 eskies per week can be transported.

(7) Issues pertaining to fresh fish marketing

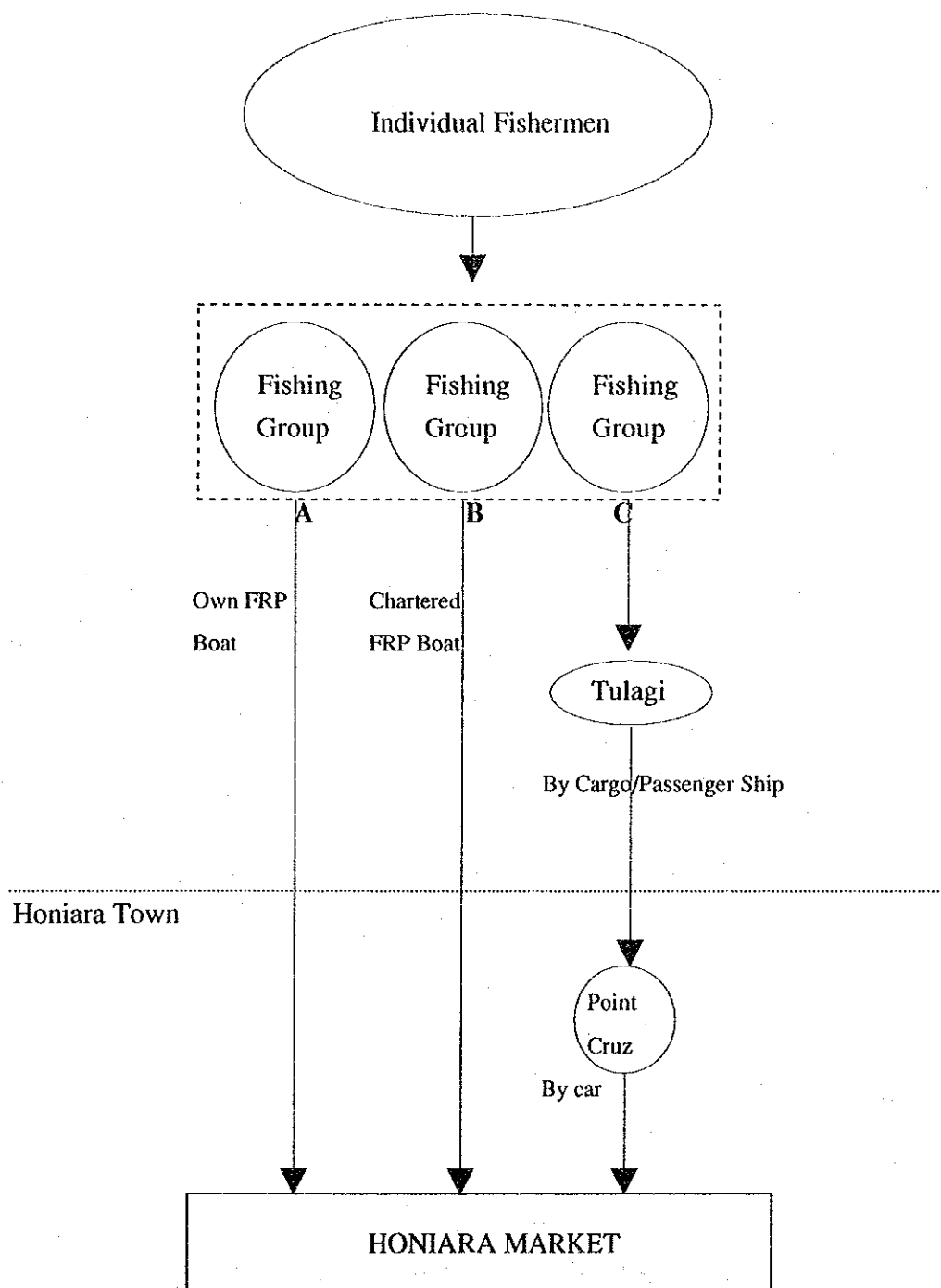
Major issues confronting the Florida Island transport groups that market fresh fish to Honiara are delineated below.

- 1) The tidal current between Honiara and the Florida Islands is swift at its midway point and FRP boats are unable to navigate this distance for many days when rough sea conditions prevails. Three FRP boats disappeared in March 1991 on their way to Honiara from Florida Islands and fishermen have been cautious since

that time. When there is danger of a shipwreck, fishermen have been known to throw out the fresh fish to lighten the boat and return to the island.

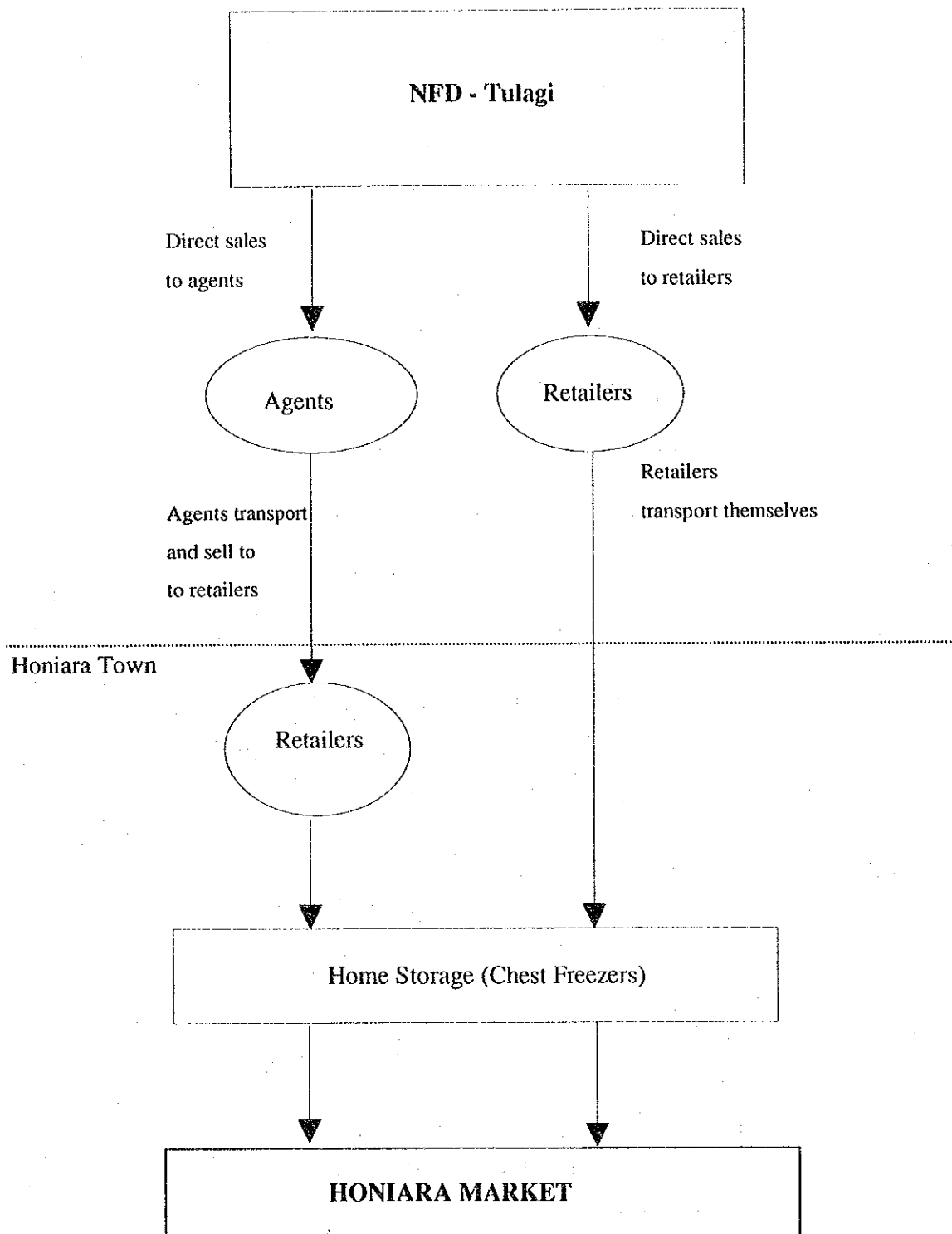
- 2) Individuals or groups that do not possess a FRP boat usually charter one. However, chartering costs are expensive and lower profits of fresh fish sales. According to the interview survey, the cost of chartering a FRP boat differs by village and is dependent on the relationship between the owner of the boat and the borrower. However, an average charge is SI\$200 including fuel. This is about 29 percent of the maximum average gross profit of SI\$700 earned at the Honiara Market.
- 3) The passenger/cargo ship departs from Tulagi and it is capable of accommodating four to five eskies per trip. However, its irregular departure schedule such as midnight departures, have made it difficult to utilize. In addition, fishermen must charter an FRP boat to transport their fish catch to Tulagi.

The aforementioned issues must be resolved before a steady supply of fresh fish at stable prices can be supplied to the Honiara market and to its inhabitants, as well as an increased fish catch and production from the Florida Islands.



Source: Market survey (The Dev. Study on Improvement of NFMS in Solomon Islands, 1993)

Fig. III.2.1.1 Fresh Fish Marketing Pattern in Florida Islands



Source: Market survey (The Dev. Study on Improvement of NFMS in Solomon Islands, 1993)

Fig. III.2.1.2 Frozen Fish Marketing Pattern in Florida Islands

Table III.2.1.1 Origin/Destination of Marketed Fresh Fish in Florida Islands (1992)

Origin	Consumption						Unit: mt
	Destination	Florida Islands					Total
		Honiara	Sand fly	Buena Vista	Big Gela	Small Gela	Sub-total
Sandfly		100	104	-	-	-	104
Buena Vista		23	-	34	-	-	34
Big Gela		62	-	-	422	-	422
Small Gela		25	-	-	-	230	230
Total		210	104	34	422	230	790

Remarks: 1) Per capita of fresh fish consumption of 9.3kg/year in Honiara.

2) Per capita of fresh fish consumption of 62kg/year in province.

3) Figures are expressed in whole weight equivalent.

Source: Field survey (The Development Study on Improvement of NFMS in Solomon Islands, 1993)

Table III.2.1.2 Cost/Profit Estimates of 3 Types of Marketing From Florida Is. to Honiara

Florida Is.			Ocean --->		Honiara	Unit: SI\$
	Unit cost	Quantity	Type A Own FRP Boat	Type B Charter boat	Type C Ship via Tulagi	
EXPENSE						
(a) Fishing collection						
Fish purchase	\$2.50/kg	100 kg	\$250.00	\$250.00	\$250.00	
Ice	\$5/tray	3 trays	\$15.00	\$15.00	\$15.00	
(b) Marketing Cost						
Packing (Ice)	\$5/tray	2 trays	\$10.00	\$10.00	\$10.00	
(c) Transport cost (Type A)						
Transport time	3 hrs	100 kg				
Fuel consumption	9 lit/hr					
Fuel cost	\$2/lit					
One way cost	\$54	2 ways	\$108.00			
(Type B)						
Boat charter	\$200	2-3 days		\$200		
(Type C)						
To Hon. By ship						
Full esky	\$35				\$35.00	
Passengers	\$12/pers.	3 persons			\$36.00	
From Point Cruz to Hon. Market						
Car/taxi to Market	\$10				\$10.00	
Return trip to Tulagi						
From Hon. Market to Point Cruz						
Car/taxi to Market	\$10				\$10.00	
Empty esky	\$15				\$15.00	
Passengers	\$12/pers.	3 persons			\$36.00	
Total (a+b+c)			\$383.00	\$475.00	\$417.00	
(d) Sales cost in Honiara						
- One day sales						
Market fee	\$20/esky		\$20.00	\$20.00	\$20.00	
- 2-day sales						
Market fee	\$20/esky		\$20.00	\$20.00	\$20.00	
Ice	\$10/block	0.5 block	\$5.00	\$5.00	\$5.00	
Storage	\$5/night		\$5.00	\$5.00	\$5.00	
Sub-total			\$30.00	\$30.00	\$30.00	
Total Expense (a+b+c+d)						
For one day sales			\$403.00	\$495.00	\$437.00	
For 2-day sales			\$413.00	\$505.00	\$447.00	
SALES	\$3.50/lbs	100 kg/esky	\$770.00	\$770.00	\$770.00	
PROFIT						
One day sales			\$367.00	\$275.00	\$333.00	
2-day sales			\$357.00	\$265.00	\$323.00	

Source: Field survey (The Development Study on Improvement of NFMS in Solomon Islands, 1993)

2.2 Fish Marketing Facilities and Related Infrastructure

(1) Fish marketing facilities

The only fish marketing facilities in Florida Island are the Fisheries Center in Tulagi and the NFD fishing base; and there are no market facilities.

1) Fisheries Center

The Fisheries Center was built by the provincial government in 1978. Its ice making equipment capable of producing 600kg of ice per day (12kg x 24 blocks of ice x 2 times) is currently inoperable and has not been repaired. As a result, fish marketing activities are not carried out. The building is presently being utilized as an office for the provincial Fisheries Division.

2) NFD fishing base

The NFD fishing base was established in 1973 and possesses 14 fishing boats. Its land facilities consist of a brine freezing facility (40 mt/day), a refrigeration facility (500 mt), and a plate type ice-making machine (20 mt/day). Due to a water shortage in Tulagi, 50 mt of water per day is transported in by tanker; and the operational ratio of its ice making machine is about 65 percent. The NFD export volume of frozen tuna and skipjack was 10,500 mt in 1992.

(2) Related infrastructure

1) Electricity

Electricity is available only in Tulagi; and the power demands of NFD, the shipyard, etc. have been met.

2) Water

Although tap water facilities are available in Tulagi, the province faces a water shortage and the provincial government is currently applying for a budget to increase its water facilities from the central government.

Although water pipes have been installed in villages in other areas, many of the pipes are damaged and the water sources have dried up.

3) Harbor facilities

Although wharves are available at Tulagi for the passenger/transport ships operating between the town and the other islands and the large fishing boats, there are no jetties at the coastal villages.

4) Roads

There is only one paved road which runs around Tulagi Island that is capable of accommodating vehicles, but the remaining roads are unpaved. There are only foot paths which run between villages on the other islands; and much of the traffic is dependent ocean transport by boats.

3. PRESENT CONDITIONS OF MODEL ZONE 3

The Model Zone 3 encompasses a wide area of Western Province. Subsequently, it was further divided into sub-zone 1 (Gizo), sub-zone 2 (Munda/Noro) and sub-zone 3 (Seghe) based on such differing factors as fishery resources, marketing conditions, infrastructure, social conditions of inhabitants.

3.1 Fish Marketing System

(1) Sub-zone 1 (Gizo area)

The areas contained in this zone are Gizo Island (37km²), Vella Lavella Island (672km²), and the northwestern segment of Vona Vona Island (189km²)

1) Socio-economy of the coastal villages

a. Gizo Island and Gizo Town

Gizo Island is the seat of the provincial government of Western Province and it is the political and economic center of the province. The area of the island is about 37km²; and according to the 1986 census, there are about 610 households and 3,710 people on the island. Its population growth rate from 1986 to 1992 is projected at 2.7 percent; and its population was estimated to be 4,350 in 1992.

In the 1986 census, about 410 households (about 67 percent of the total number of households on the island) or about 2,300 people (62 percent of the island population) were living in Gizo Town and in the hilly area behind it. Aside from the town area, there are 11 villages on the island with about 200 households. The majority of the households on the island are concentrated in the town and its surrounding area.

Gizo Town contains the provincial government office, related government facilities, hospitals, private businesses, factories, etc. and the surrounding environs are the residential areas of their employees.

The more than 40 private businesses include banks, transport services such as Solomon Airways, construction, shipbuilding, and tourist companies, stores, etc. There are many salaried workers and it is the only consumer society in the western area of the province. Privately owned stores sell food and daily commodities not only to Gizo residents, but to the inhabitants of the nearby islands as well. In addition, the island is surrounded by reefs which make it a

popular tourist spot for divers. Subsequently, the tourist industry and transport services have flourished.

Gizo Island is inhabited by many salaried workers employed by the provincial government and private businesses in Gizo Town. According to the 1986 census, 65 managers and business owners and 792 salaried workers throughout the island were recorded. Unfortunately, the area occupied by Gizo Town is narrow, constricted by hills immediately behind it. As a result, the lack of land area has limited its development as an industrial town.

b. Ranonga and Vella Lavella Islands

Ranonga Island is located approximately 40km west of Gizo Island. It is a long and narrow island encompassing an area of approximately 27km north to south and it is only 8km at its widest point. There is a total of about 48 villages throughout the island, of which 60 percent are concentrated in the comparatively level region of the east coast. A population of about 3,840 people and 554 households were recorded in the 1986 census.

Although it is a small island, there is a chain of 200 to 400m hills and the entire island is steep and hilly with very little level land along its coasts. There are very few reefs along the shore and its coastal waters are deep. There are many small and medium sized rivers and the island possesses abundant water resources.

Wharves have been built in Keara in the southern area of the west coast, in Penjapenja the central area of the island, and in Mburi in the northern area of the east coast.

Vella Lavella Island is located about 20km southwest of Gizo Island; and it is 45km long from north to south. It is about 26km wide from east to west at its most widest point; and the total land area is about 672km². The entire island is hilly with a chain of 200 to 600m hills and it is rich in forestry resources. Presently a foreign logging company is carrying out its operations in the northern and mid-western areas of the island. There are many small and medium rivers and water resources are abundant. There is a comparatively large number of villages with tap water facilities.

In addition, its coastal reefs are well developed with rich fishery resources.

Villages are mainly found in the level areas of the coast and there are about 78 villages throughout the island. The number of households is about 960 with a total population of about 6,545, according to the 1986 census.

The inhabitants of both islands mainly engage in subsistent agriculture and fisheries and food provisions are sufficient. However, a monetary economy is widespread, due to the resident taxes (SI\$10 annually by every person over the age of 14), educational costs (annual educational costs per student is SI\$100), clothing, and other daily commodities.

Copra production is a stable means of earning cash income, in addition to selling root crops, produce, betel nuts, fresh fish, etc. in Gizo Town, although the volume is minimal.

According to 1986 census statistics, about 497 people in Ranonga and 920 people in Vella Lavella islands earn cash revenue through one means or another. If it is assumed that one person from each household is employed, nearly 90 percent of the households in Ranonga and 96 percent of the households in Vella Lavella islands has some means of earning cash income. About 73 percent of all cash income earnings stem from agricultural, forestry, and fishing activities.

The church plays an important role in the social life of the inhabitants of both islands. The majority of the populace belong to the Seventh Day Adventist Church (SDA) or the United Church (UC); and the village lifestyle is centered around the church. Communal village work begins with voluntary church activities and includes cleaning and school related activities in the village, but village communal work is stressed over individual work. As a result, villages tend to be tightly knit communities.

Each village usually has several blood-related clans or tribes, each with a respective chief managing its affairs. Land disputes are settled by the chiefs in joint meetings; and the central and provincial government and private companies must receive the chief's permission or cooperation in all affairs pertaining to the villages.

c. North Vona Vona Island

Vona Vona Island is located about 20km southwest of Gizo Island and it is midway between the provincial capital of Munda and Gizo Island. It can be reached in about 60 to 90 minutes by FRP boat from Gizo.

The island is surrounded by reefs and lagoons; and STL bait fish operations are actively carried out in the Vona Vona Lagoon in the northern area of the island. Although the island contains low hills of 20 to 30m, much of its land area is level, with farm lands and coconut groves spreading from northeast to south.

There were 390 households and a population of approximately 2,800 people recorded in the 1986 census; and there were about 23 households and 530 people in the northwestern area of the island which is located in the development zone of this Project.

The life of the island inhabitants is based on subsistent farming (cultivating root crops, vegetables, and fruits) and fishing. However, a monetary economy is widespread and there is a comparatively large number of salaried workers. About 210 salaried workers throughout the island were recorded in the 1986 census. In addition, 296 people were engaged in independent farming and fishing operations.

Fisheries is prevalent in the northwestern area of the island and there are about four fishermen groups who purchase and sell the fish catch of other villagers in Gizo Town or to the provincial Fisheries Division, in addition to their own. Root crops, fruits, and vegetables are also transported and sold in Gizo Town, as a means of earning cash income.

2) Fishery resources and production

The Gizo area contains Gizo, Ranonga, Vella Lavella, and Vona Vona islands. Fishery resources and conditions in production on each island are explained below.

a. Fishing grounds

- Gizo Island

Gizo Island is surrounded by reefs scattered over a wide area which form fishing grounds rich in reef fish. These fishing grounds extend to the grounds located midway between Gizo and Ranonga islands.

- Ranonga Island

The east and west coasts of Ranonga Island face the open sea and its coastal structure is simple. Increase in fish production can not be expected under the existing conditions of fishing boats, gear, and technology. An exception is Koriobuku and Nburi districts. The center is the cape located on a plateau and there is a small bay on the inland side which is unaffected

by the wind and waves from the open sea and it provides excellent docking for fishing and ferryboats. In contrast, the opposite side contains reefs which form one of the best fishing grounds in Western Province.

- Vella Lavella Island

Vella Lavella Island is a rectangular shaped island running northwest to southeast. The island's west, north, and east sides are blessed with widespread coastal reefs which are good fishing grounds. The southern coast is simple, with narrow reefs and inferior fishing grounds in comparison to the other coasts.

- Vona Vona Island

Vona Vona and Robiana Lagoons are two of the foremost fishing grounds in the entire nation. There are numerous flat and low islands within these lagoons which are surrounded by reefs. These reefs contain lobsters and other shellfish, in addition to being the breeding grounds for coastal fish such as sardines which are bait fish used in harvesting skipjack and yellowfin. They are the most ecologically important ocean areas in the Solomon Islands.

b. Major fish species

Bottom fish such as snapper, grouper, emperor, jobfish, short-tailed red snapper, and trevally are caught by hook and line and milkfish and napoleon fish are harvested by spearing.

c. Fishing boats, gear, and fishing methods

Although FRP boats are used in Titiana in Gizo Island, the majority of the areas rely on dugout canoes.

d. Fishery resources

Fishing grounds are widespread and over fishing is not a problem at the current level of fishing technology and production effort.

3) Fish marketing structure

Marketing patterns for fresh, frozen, and processed fish in the area is shown in Fig. III.3.1.1. Presently, there are four major distribution patterns for fresh fish which are explained below.

a. Fresh fish is directly marketed to the consumer by the producer.

This type of fish marketing pattern is carried out by professional fishermen from two villages on Gizo Island. They are the immigrants from Malaita

whose village is located on the Gizo Harbor and the immigrants from Kiribati in Tiatiana village. The former is comprised of 20 households belonging to four blood related clans and the latter is made up of 10 households fishing in large canoes with outboard engines and FRP boats. The fresh fish supply of Gizo Town residents is mainly produced by these two groups and mostly skipjack and reef fish are marketed.

In addition, a negligible volume of fish is sold by islanders in need of cash revenue who stay for long periods of time with clansmen living in Gizo, carry out their fishing activities in dugout canoes, and sell their catch on the beaches of Gizo.

b. Fish is distributed to the consumer via the provincial Fisheries Centers or fishermen organizations.

b-1. Fresh fish is sold directly by the producer or via the provincial Fisheries Center or fishermen organization after being purchased from the island villages and transported there.

b-2. Fresh fish is transported and sold by the cargo ship of the provincial Fisheries Center.

- Although a segment of frozen and processed fish is earmarked for the Gizo consumption market, the majority are sold to Solomon Taiyo Co. Fishermen organizations market only dried beche de mer and lobster.

- The fish transport ship owned by the provincial Fisheries Center has been inoperable for the past two years. When it was in operation, fresh fish from about 18 villages on the islands of Ranonga and Vella Lavella was collected and shipped.

4) Origin/destination volume of fish

The origin/destination of fresh fish marketed to the Gizo market is shown in Fig. III.3.1.2. The total supply volume of fresh fish in 1992 for this area was 1,042 mt of which 86 percent or 893 mt were consumed locally by coastal villages. Only 12 percent of this volume or 125 mt were supplied to the Gizo Town consumption area by the coastal villages of Gizo Island. The remaining 2 percent or 24 mt were shipped to the Gizo Fisheries Center from Ranonga Island and Ralumana of Vona Vona Island and from there, transported three times a month to STL in Noro.

5) Fish marketing cost structure

A cost analysis of fish originating from Gizo and Ranonga islands and marketed in Gizo Town is shown in Table III.3.1.1.

The purchase price of fish in the production area by fishermen cum transporters averages SI\$1.56/kg and the wholesale price of the Gizo Fisheries Center is about SI\$2.25/kg. The center's retail price to consumers in the Gizo district is about SI\$2.85/kg and it is extremely low in comparison to the average retail price of SI\$7.70/kg in Honiara.

The villagers of Gizo Island do not use ice during harvest and transport of fresh fish, due to the short transport distance. In a cost breakdown of 100kg of fish sold (equivalent to one esky) at the retail price of SI\$225, 69 percent or SI\$156 is the purchasing cost, 7 percent or SI\$16 is the fuel cost, and 24 percent or SI\$56 is the profit.

In contrast, the transport volume of fish originating from Ranonga Island is 300kg per trip, in order to save on fuel costs. If this volume is sold for SI\$675, the purchasing cost at the production site is 69 percent or SI\$468, ice and fuel costs are about 8 percent or SI\$56 and SI\$54, respectively, and the profit is 15 percent or SI\$97. If this is calculated on a 100kg basis, the profit is SI\$32 which is SI\$24 less than the profit earned on Gizo Island. This underscores the disadvantage of bringing in fish from distant area.

The Gizo Fisheries Center stores its purchased fish in the center's refrigerator (-20°C), but a major portion of the fish is locally consumed; and only a small segment is sold to STL in Noro. If 100kg is sold for local consumption, the retail price is SI\$285 of which 79 percent or SI\$225 is the purchase cost; electricity and labor costs are 8 percent and 7 percent, respectively or SI\$23 and SI\$20; and only 6 percent or SI\$17 is the profit.

In contrast, when fish is sold to STL in Noro, 500kg of fish is transported per trip and is sold for SI\$2,200. The purchase cost is 5 percent or SI\$125, electricity, labor, and fuel costs are 5.3 percent, 4.6 percent, and 3.4 percent, respectively or SI\$115, SI\$100, and SI\$75. The profit is 35.7 percent or SI\$785 which is very good.

6) Sea transport system

Regular ocean transport services are available between Gizo and Honiara. Services are provided by one passenger ship, two cargo ships, and one passenger/cargo ship.

The passenger ship navigates these waters once a week and the cargo ships operate three times a month. STL canned tuna is transported by cargo ship to Honiara, but eskies containing fresh fish are not carried. The passenger ship Ramos I began transporting both cargo and passengers from the summer of 1993. Although ten eskies of fresh fish can be accommodated, at present only five eskies per trip are transported from Yandina.

7) Issues in fresh fish marketing in Sub-zone 1

a. Market sales

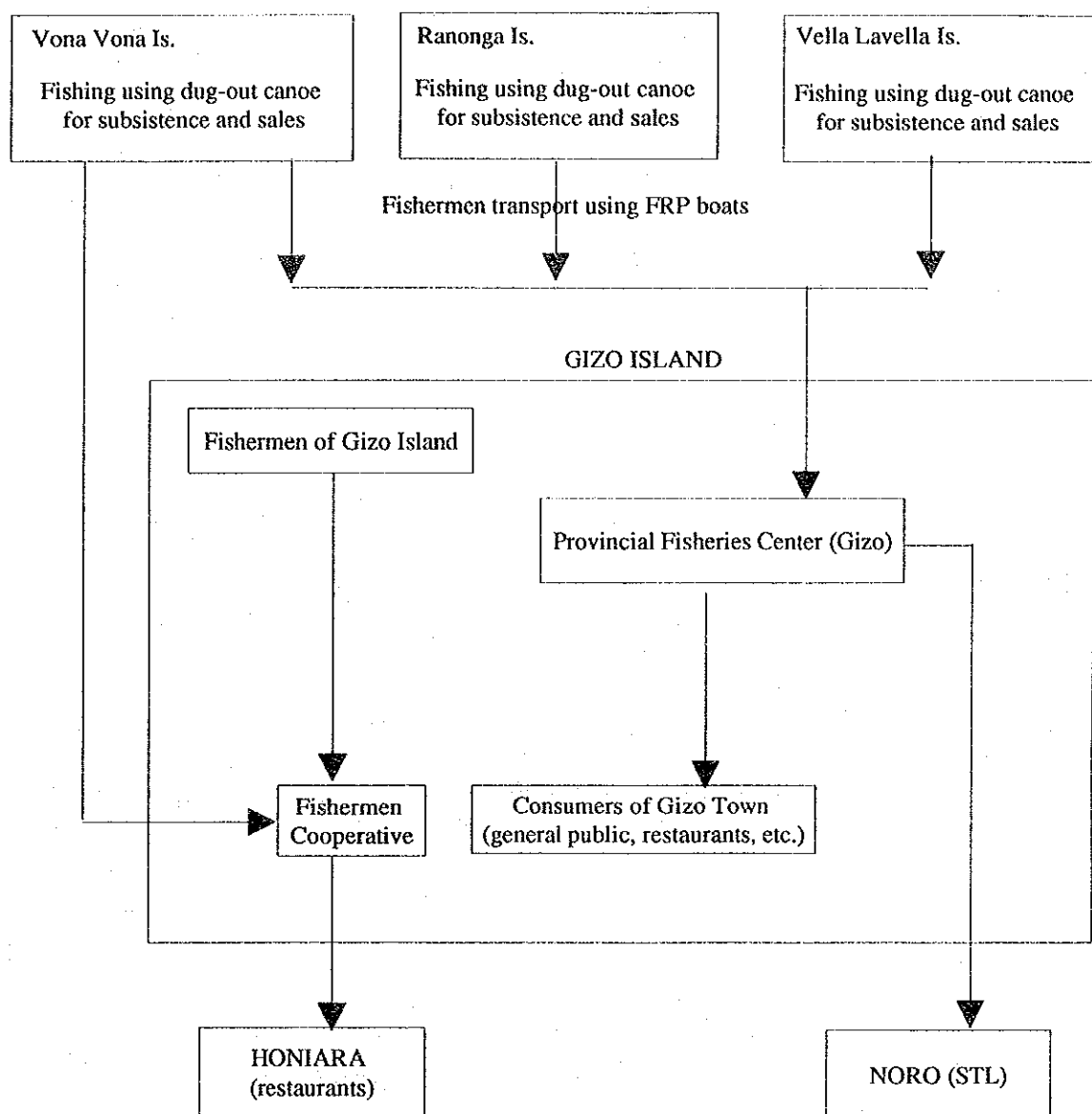
- The market scope of fresh fish is small and limited to only Gizo and Noro.
- There is no set time period when fish is sold directly by professional fishermen in Gizo which is inconvenient for the consumer.
- Due to an unstable supply of fish, the Fisheries Center is unable to stock a uniform volume of fish which is another inconvenience for the consumer.

b. Fish transport

- The current fish transport and marketing system to the large consumer market of Honiara is not viable economically.
- The volume of fresh fish shipped from the islands to Gizo has been drastically reduced due to the mechanical breakdown of the transport ship belonging to the provincial Fisheries Center.
- The ocean waters between Ranonga and Vella Lavella islands to Gizo are often rough and dangerous for FRP boats transporting fish. As a result, the fish supply has been unstable. (A STL tuna fishing boat sank in January 1993).

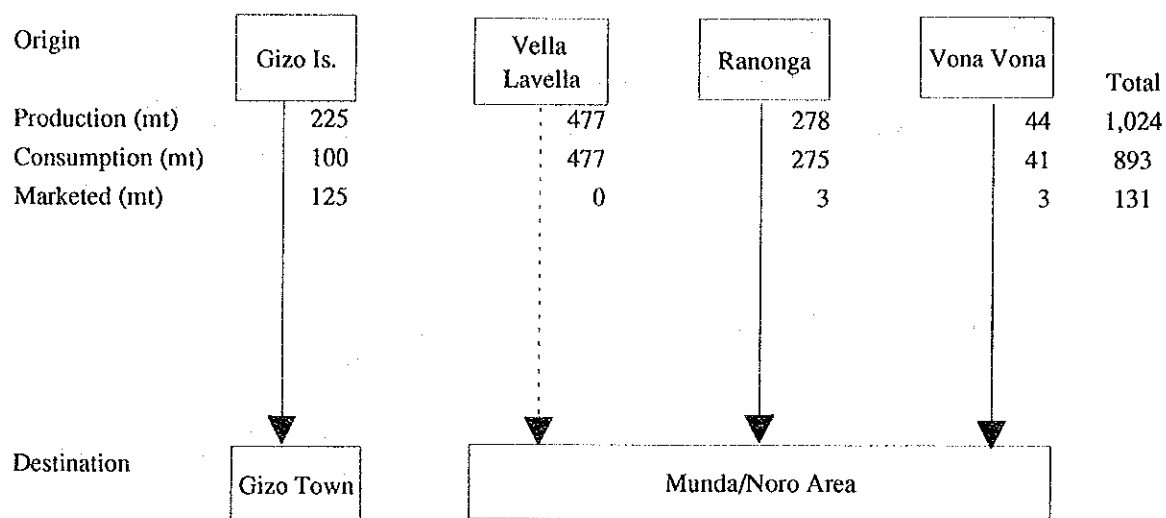
c. Production

- Professional fishermen in Gizo sell their catch directly to consumers and further increases in fish catch volume is limited.
- There is no ice-making or ice storage facility on the islands which makes it difficult to maintain the quality of fish.
- The ability of the inhabitants to maintain fish quality is poor.
- Production volume of fish can increase with the increase in fishing effort.



Source: Market survey (The Dev. Study on Improvement of NFMS in Solomon Islands, 1993)

Fig. III.3.1.1 Fish Marketing Pattern in Sub-Zone 1 (Gizo Area)



Source: Market survey (The Dev. Study on Improvement of NFMS in Solomon Islands, 1993)

Fig. III.3.1.2 Origin/Destination of Marketed Fresh Fish in Gizo Is., Vella Lavella , Ranong & Vona Vona (1992)

Table III.3.1.1 Fish Marketing Routes and Its Cost

Western Prov.				Unit: SI\$	
ORIGIN		Via		DESTINATION	
Gizo Island	Unit cost	Ocean	--->	Ocean	---> Gizo F Center
Sales	\$2.25/kg 100 kg				\$225.00
Expenditure					
Fish purchase	1.56/kg 100 kg	\$156.00			
Fuel	\$1.56/l 10 lit	\$16.00			
Total		\$172.00			
Profit					\$53.00

ORIGIN		Via		DESTINATION	
Nburi	Unit cost	Ocean	--->	Ocean	---> Gizo F Center
Sales	\$2.25/kg 300 kg				\$675.00
Expenditure					
Fish purchase	1.56/kg 300 kg	\$468.00			
Fuel	\$1.56/l 36 lit	\$56.00			
Ice	\$3/tray 18 trays	\$54.00			
Total		\$578.00			
Profit					\$97.00

ORIGIN		Via		DESTINATION	
Gizo F Center	Unit cost	Gizo Town Sales		Ocean	-Sales (Noro)
Sales (Noro-STL)	\$4.4/kg 500 kg			500 kg	\$2,200.00
Sales (Gizo Town)	\$2.85/kg 100 kg	\$285.00			
Expenditure					
Fish purchase	\$2.25/kg 100 kg	\$225.00		500 kg	\$1,125.00
Electricity	\$0.23/kg 100 kg	\$23.00		500 kg	\$115.00
(cold storage)					
Salary & wages	\$0.20/kg 100 kg	\$20.00			\$100.00
Fuel				\$1.56/lit 48 liters	\$75.00
		\$268.00			\$1,415.00
Profit					\$17.00
					\$785.00

Source: Field survey (The Development Study on Improvement of NFMS in Solomon Islands, 1993)

(2) Sub-zone 2 (Munda/Noro)

1) Socio-economy of the coastal villages

A branch office of the provincial government of Western Province is located in Munda and it is the administrative center for the western area of New Georgia Island and Rendaba District. The provincial Forestry Department, police office, post office, the provincial Fisheries Center, dormitory for its government workers, and other related facilities, hospital, hotel, wharf, and international airport are located in Munda.

A passenger/cargo ship calls at Munda three times a week during its regular service between Gizo and Honiara. There are daily flights to Honiara and transportation services between Munda and Honiara are good. In addition, it is a popular tourist spot since the area contains both Vona Vona and Robiana lagoons which contain the foremost reefs of the nation.

The land area of Munda Town is narrow (provincial government land) and it contains mainly provincial government related offices, private companies, and dormitories. According to the 1986 census, there were about 39 households in a population of 300 people. However, the village population surrounding the town (Ward 24 and a segment of Ward 23) contained about 350 households in a population of 2,200 people. This population is growing in conjunction with the development of Noro and industries such as tourism; and it is projected that the population will reach 2,660 in 1992 and 2,920 in 1995.

Noro is located approximately 40 kilometers northwest of Munda and is set in the Hawthorn Straits. It is a new industrial town developed by the Solomon Island government, STL, and JICA. Large, deep wharves, refrigeration, and copra storage facilities have been built and it is fully equipped to fulfill the role of an international commercial port.

Noro is the base of STL Company, the largest bonito and skipjack commercial fishing industry in the nation which also operates a canning and smoking factory. At the initial start of STL operations in Noro in 1985-1986, there were 876 employees and about 31 households comprising about 230 people in and around Noro. But with the start of full operations, the population rapidly increased to about 2700 employees and their families, 378 provincial government workers and their families, and 1150 neighboring villagers for a total population of about 4,500 people. In the latter half of the 1993, a Town Council was instituted.

The road between Munda and Noro is paved and the supply of electricity is good. In addition, there is sufficient land space for further development. In future, it is anticipated that it will become the nation's largest industrial city in the west.

With the establishment of STL in Noro, an increasing number of inhabitants from the nearby coastal villages of Munda and Noro have become STL employees and a hitherto subsistent economy has changed to a monetary economy.

Although subsistent cultivation of staple crops, fruits, and vegetables still continues, fishermen have become absorbed into STL's work force which has contributed to a drop in the fishermen population. As a result, fresh fish production has been unable to keep up with the growth in consumer population and there is a constant shortage of fish in the Noro and Munda districts. The demand for fresh fish is expected to rise, and securing fresh fish production or imported fish is an issue confronting these districts.

2) Production of fishery resources

a. Fishing grounds

Noro is located in the center of the Hawthorn Straits which stretches for about 10km in length and 1.5km in width. Although there are very few reefs, the waters of the straits are relatively calm and serve as fishing grounds for the villages surrounding Noro. Munda is located in the Roviana Lagoon which is 54km long and 3km wide and Vonavona Lagoon is also located nearby. The reefs, rocks and banks of this lagoon provide excellent fishing grounds.

b. Major fish species

Among the major fish species harvested in the reefs are sardines and Indian mackerel which are caught by nets and rabbit fish, job fish, and parrot fish which are caught by hook and line. Spangled emperor, two-spot red snapper, jobfish, coral trout are harvested in the outer rim of the reefs and shallow water fish such as king fish, trevally, bonito, yellowfin and demersal fish such as emperor fish, long-tail red snapper are caught in the open sea.

c. Fishing boats, gear, fishing methods

Single seat, hand rowed dugout canoes are made by each village. The scope and number of fishing operations are restricted, due to frequent bad weather. Most of the fishing is carried out by hook and line and net fishing in the lagoon is limited and it is not commonly used among fishermen.

d. Resources

The harvest volume is small in view of the nation's vast ocean territory; and at current levels of fishing technology and production volume, resources are not threatened.

3) Fresh fish marketing structure in Noro/Munda Districts

The fresh fish supply of Noro and Munda districts have not been able to keep up with the rising demand, due to an undeveloped marketing network for fresh fish. Presently the fresh fish of Munda District is supplied by the nearby coastal inhabitants, Munda Fisheries Center, and by the Puga Project which markets the fresh fish of Ndunde village. In addition to this, frozen reef fish is sent once a month from the Gizo Fisheries Center and distributed locally (Fig. III.3.1.3).

Fresh fish in the Noro District is supplied by STL (fresh fish purchased from Gizo District) and the nearby coastal villages where fishing is carried out by ten dugout canoes. A segment of the fresh fish of Munda Fisheries Center and the Puga Project is sold to the residents of Noro District. In addition, STL frozen skipjack is also supplied to Noro inhabitants.

STL frozen skipjack is also supplied to the retailers in Honiara via wholesalers and sold to the consumer.

4) Origin/destination volume

The origin/destination of fresh and frozen fish marketed in Munda and Noro districts are shown in Table III.3.1.2. Of the total fish supply volume of 385 mt in these two areas, 17 mt were frozen fish and the remaining volume was comprised of fresh fish. Approximately 368 mt of fresh fish was supplied locally; 11 mt of frozen fish was provided by STL; and 6 mt of frozen reef fish was supplied by the Gizo Fisheries Center.

Of the total supply volume of 385 mt, 55 percent or 212 mt are harvested for subsistence by coastal villages. The consumption volume of the town areas of Munda and Noro is equivalent 173 mt or 45 percent of the total fish supply volume. Of this figure, 156 mt are fresh fish and 17 mt are frozen fish.

5) Fish marketing cost structure

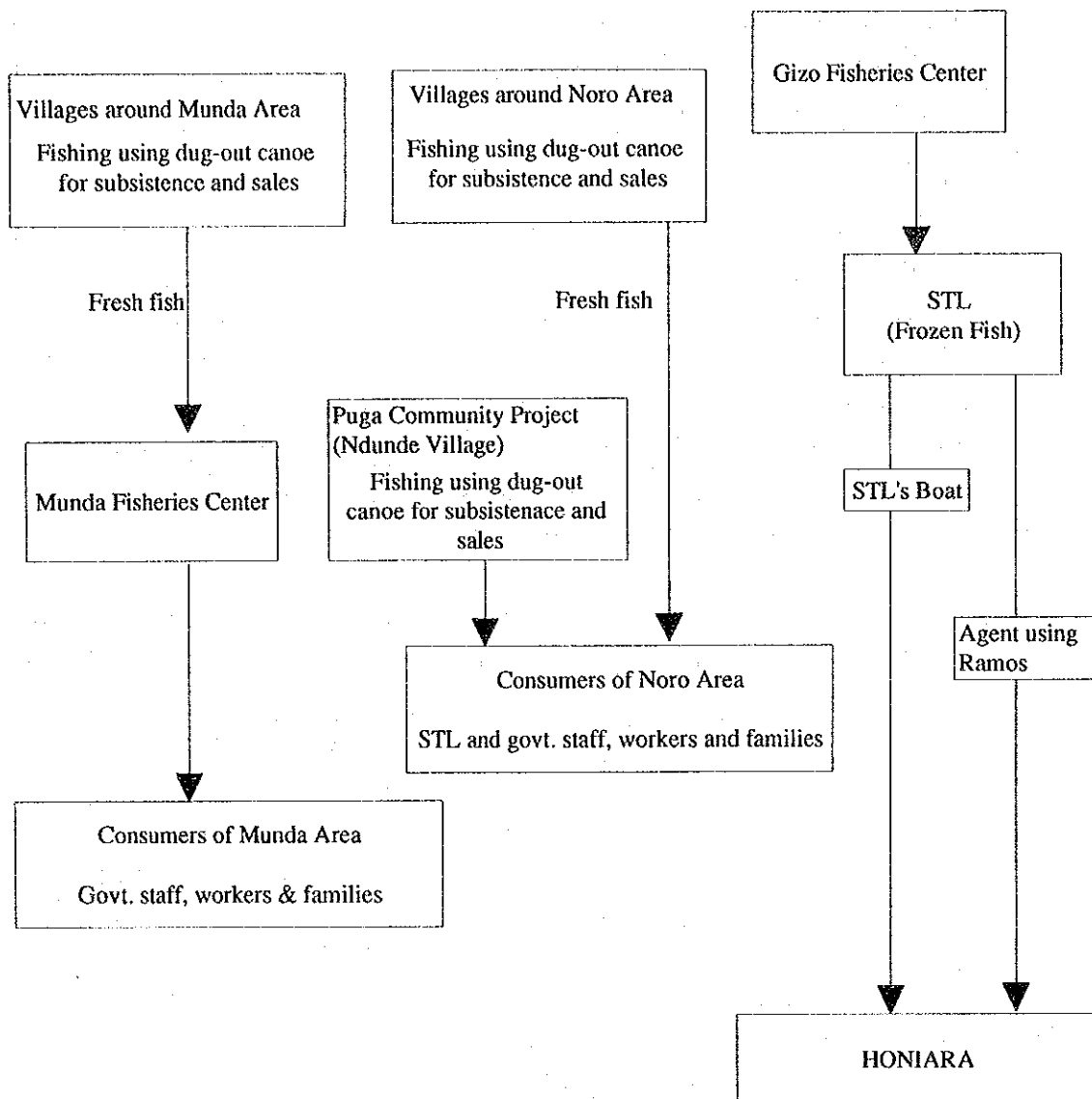
The purchase and retail price of fresh fish marketed by the Munda Fisheries Center is the same as that of Gizo Fisheries Center. The marketing cost structure is also the same as Gizo coastal villagers who transport and sell their fish catch to the Fisheries Center.

6) Sea transport system

The transport ship which navigates the distance between Honiara and Gizo also passes through this area.

7) Issues in fish marketing

The demand for fresh fish in the Noro and Munda districts is high; and presently, fresh fish supply is insufficient because of a drop in the fishermen population of the nearby coastal villages. Since industry and tourism is prevalent in these two districts, the coastal villagers are rapidly becoming salaried workers; and as a result, it has become increasingly difficult to increase fish production volume. Ways to increase the fishing effort and activities of the remaining coastal fishermen and measures to secure a stable supply of imported fresh fish are issues which need to be resolved by both districts.



Source: Market survey (The Dev. Study on Improvement of NFMS in Solomon Islands, 1993)

Fig. III.3.1.3 Fish Marketing Pattern in Sub-Zone 2 (Munda/Noro Area)

Table III.3.1.2 Origin/Destination of Marketed Fish in Noro/Munda Area (1992)

Unit: mt

Origin	Destination	Ward 23		Ward 24	Total
		Noro/	Munda	Ndunde Village	
		Munda Town	Village	Lambebe	
Fresh fish					
	Munda	62	132	0	194
	Ndunde/Lambebe	94	0	80	174
	Sub-total	156 (41%)	132 (34%)	80 (21%)	368 (96%)
Frozen fish					
	STL	11	0	0	11
	Gizo FC	6	0	0	6
	Sub-total	17 (4%)	0	0	17
Total		173 (45%)	132 (34%)	80 (21%)	385 (100%)

Source: Market survey (The Dev. Study on Improvement of NFMS in Solomon Islands, 1993)

(3) Sub-zone 3 (Seghe)

1) Socio-economy of coastal villages

Seghe Island lies between the eastern tip of New Georgia and Vangunu islands, near the south entrance of Marovo Lagoon and it faces Njae Straits. A branch office of the Western provincial government is located here and the island contains a police station, post office, airport, provincial Fisheries Center, etc. With the exception of the Fisheries Center, nearly all institutions are concentrated around the airport. The only existing road is a narrow footpath that stretches 500 meters from the airport area to the Fisheries Center. Ocean transport is the only means of reaching the villages and other districts from the provincial government branch office.

There are only two or three villages near the government branch office and the remaining villages are scattered throughout Marovo Lagoon and the east coast of Bagunu Island. Only eight villages exist in a radius of 10km and there are only 30 villages in a 20km radius.

Village life is centered on subsistent agriculture (root crops, fruits, vegetables) and fishing. Copra is produced as a cash crop. Another means of earning cash income is woodcarving, albeit nominal in scope. The inhabitants of Patiba and a few other areas sell fruits, root crops, and fish to passengers on the transport ships that pass through regularly and opportunities to earn cash income are scarce.

Although fishery resources are abundant due to the Marovo Lagoon and there is provincial Fisheries Center located there, the only salaried workers are the provincial government workers and their families. As a result, fisheries has remained subsistent. However, an EC project promoting small-scale commercial fisheries in the Seghe area will begin in 1994; and it is anticipated that commercial fisheries will evolve in this area.

2) Fishery resources and production

a. Fishing grounds

The fishing grounds of Seghe are abundant due to its location in Marovo Lagoon, the largest lagoon in the nation. A few small islands are scattered throughout the lagoon and their surrounding reefs are inhabited by reef fishes and they are breeding grounds for sardines .

b. Major fish species

Major fish species include demersal fish such as parrot fish, grouper, red snapper and pelagic water fish such as king fish, skipjack, and rainbow runner.

c. Fishing boats, gear, fishing methods

Most of the fishing boats are one man dugout canoes and much of the fishing is by hook and line. A few canoes with outboard engines and FRP boats are engaged in trawling operations.

d. Resources

Fishing grounds are spread out over a wide area and at present levels of fishing technology and production, resources are not threatened.

3) Fishing marketing structure

As of September 1993, 13 households in Seghe employed by the provincial government, purchase fresh fish from the neighboring villagers, but there is no actual fish marketing structure.

However, Patiba village (48 households) on the opposite shore from the Fisheries Center sells prepared fish once a week to passengers traveling between Gizo and Honiara on passenger transport vessels.

As of 1992, fresh fish has been marketed according to the following patterns.

- a. The provincial Fisheries Center purchases fresh fish from neighboring villages and transports it to the Gizo Fisheries Center.
- b. The fishermen association set up in Pateiba village purchases fresh fish from non-members and transports it to Honiara via passenger/cargo ship.
 - Presently, fresh fish purchasing activities of the provincial Fisheries Center have ceased due to a shortage of purchasing funds from the provincial Fisheries Division and a breakdown of its ice-making machine.
 - The fishermen association of Pateiba village (unregistered) was established in 1989 as a community project. Initially, the association purchased fresh fish by leasing a section of the Fisheries Center facilities. However, these operations were stopped when the organization became unable to pay the lease (due to the irregular schedule of the transport ship, fresh fish spoilage, and termination of fresh fish transport services by the passenger/cargo ship which created a deficit).

4) Origin/destination volume

Due to the lack of a neighboring consumption market and an ice supply facility, there is no outflow of fishery products and all fish are locally consumed.

5) Ocean transport system

Transport services running between Honiara and Gizo pass through this area. (Refer to Sub-zone 1, Gizo District sea transport system.)

6) Issues in fish marketing

Despite the area's rich fishing grounds, there is no consumption market nearby. In addition, the ice-making machine is inoperable and an ocean transport system for fish is undeveloped. Subsequently, fish is not marketed to other areas.

3.2 Fish Marketing Facilities and Related Infrastructure

(1) Sub-zone 1 (Gizo)

1) Fish marketing facilities

There is a Fisheries Center and one fish transport vessel owned by the center in the Gizo area. In addition to this, there is an ice-making machine on Vella Lavella Island and in Moro village in Ndovele District.

a. Fisheries Center

The Gizo Fisheries Center was built in 1984 and is involved in fish marketing, outboard engine repair, and training and educational activities for fishermen.

- Ice-making facility: Produces 0.5 mt/day of flake ice.
- Refrigeration facility: 20m³ (-20°C) x one room, 8m³ (0°C) x one room.
- Workshop: Repair of outboard engine.
- Jetty: Length 10m x width 3m, connecting access way 16m x width 2m

The aforementioned facilities are all in operation and they are effectively utilized by everyone.

b. Fish transport vessel (Kuarao)

This vessel was constructed in 1984 and transported fresh fish from each island to its base in Gizo until 1990. It is currently inoperable and is scheduled to undergo repairs in 1994.

- Gross tonnage: 4.94 mt
- Length x width x draft: 11.82m x 3.25m x 1.58m
- Engine: 90 horsepower
- Maximum velocity: 12 knots
- Crew: 4 members

c. Ice-making facility at Ndovele

This facility was provided by the Japanese government in 1983. It produces 0.5 mt/day of flake ice and there is a one ton capacity ice storage facility and an indoor 10KVA power generator. However, these facilities were not used for a long period of time due to a political dispute among the villages in the area. Recently, the dispute was resolved and the facility has been able to resume operations. Unfortunately, parts of the ice-making machine have been lost and commencement of operations is undetermined. A two ton rainwater tank has also been provided for water supply.

d. Ship repair dock

This is a repair dock for building wooden boats and there are two slipways. Presently, it is used to repair both wooden and FRP boats.

2) Related infrastructure

a. Electricity

Electricity is available only in the Gizo area. The power generator has a capacity to produce 600kw of electricity (200kw x 3 generators, installed in 1991). It is currently able to meet industry demands and to provide lighting in the town. However, deterioration of power lines is conspicuous.

b. Water supply

Although there is a water supply facility in Gizo, there is a water shortage when the water level in the dam drops. In addition, when the filter becomes clogged, the water becomes turbid and drinking water is supplied by a water mill.

In villages with water tap facilities, water supply is inadequate due to the location of the water source, pipe breakage, and other problems.

The village on the western coast of Vella Lavella Island has an abundant water supply from the river flowing through it and there is no water turbidity.

c. Harbor facilities

Inter-island transport ships, a petroleum firm, a Fisheries Center, hotels, wharf, and jetty are found in Gizo, in addition to numerous wooden jetties for small boats.

d. Airport

The airport is located on an offshore island 2km away from Gizo Town with a 1,000m runway. There are one to two regular daily flights.

e. Roads

There are roads within Gizo Town to the surrounding villages which can accommodate motor vehicles, but they are unpaved. There are only footpaths connecting villages on the other islands.

(2) Sub-zone 2 (Noro, Munda)

1) Fish marketing facilities

Noro is the new industrial town of the Solomon Islands and it is a large commercial fishing base, with transport and storage facilities for copra and an infrastructure equal to that of an international port. It is the future industrial and trade center in the western area of the nation.

a. Noro STL fishing base

Noro is the fish landing and processing base for bonito and skipjack.

- Fishing boats: Skipjack fishing boat, purse seiners, transport ships, 15 Solomon Island boats, and 12 Okinawa boats for a total of 27 boats
- Fish landing wharf: Length 100m x water depth of 6.5m
- Freezer: 110 mt/day, Brine type
- Refrigerator: 800 mt (-25°C)
- Ice-making facility: 35 mt/day of flake ice
- Canning factory: 3,820 cartons/day (200g cans x 48 cans per carton)
- Smoked fish plant: 5 mt/day
- Fish meal plant: 5 mt/day

The average annual fish landing volume is 30,000 mt; the production volume of canned fish is about 65,000 cans; and the production volume of smoked fish is about 2,000 mt.

b. Noro Fisheries Center

The Fisheries Center was built under Japanese government assistance in 1990 to promote coastal fisheries, but currently it is under STL management at the request of the provincial government. With the exception of the ice-making facility, the center is being effectively used.

- Freezer: 4 mt/day/12 hours (-35°C), air-blast type
- Refrigerator: 500 mt (-25°C)
- Ice-making equipment: 1 mt/day of cubed ice, 5 mt/day of flake ice
- Wharf: Length 100m, water depth 6.5m

c. Fuel Plant

This facility was built with Japanese government assistance in 1988 to supply fuel to the fishing boats and the power generator, etc.

- Fuel storage tank: 3,000kl x 2
- Fuel pipe, pump facilities: 1

d. Munda Fisheries Center

This center was built by the provincial government in 1986 and is capable of producing 600kg of ice/day (12kg x 24 slabs of ice x 2 times). One of the two brine tanks is out of order and the production capacity of the facility has been halved. There are also two chest freezers which is used in fish marketing activities.

e. Lambert Produce, Ltd.

Lambert Produce, Ltd. is an Australian fishery company from Townsville which owns the facility adjacent to the Munda Fisheries Center. The five ton refrigerator (-15°C) and the blast-air freezer (-35°C) were transferred from the Gizo Fisheries Center and leased by Lambert Produce from the provincial government. The company deals in coral trout, rock cod, and red snapper and there are plans to export frozen and processed fish. It is currently operating on a trial basis.

2) Related infrastructure

a. Electricity

Noro has a power generator with a capacity of 3,000kw and the electricity demand of existing industries and homes is about half this capacity. Subsequently, there is sufficient capacity to accommodate new industries. Munda has the capacity to generate 160kw of electricity (120kw + 40kw). However, the 40kw power generator is under repair. The total electricity demand of Munda is 40kw which is being sufficiently met.

b. Water supply

Noro has a water supply facility capable of supplying 9,000m³/day of water and presently, supply and demand is balanced. Although there is a water supply facility in Munda, there is a water shortage in the hospital, school, and villages in the suburb (Down Village) due to low water pressure of the pump.

c. Harbor

Noro is an international port and the fishing base also owns its own wharf. Currently, a container yard is being planned which will further enhance its facilities.

Munda has a wooden jetty capable of accommodating small boats of up to 10 mt. In addition, hotels also have their own jetties for boats.

d. Airport

There is an international airport with a 1,280m runway in Munda. Irregular ocean transport services between Munda and Townsville are also available. There are also regular transport services to Honiara twice a day.

e. Roads

With the development of Noro, a road 17km long and 6m wide has been built between Noro and Munda. However, only 3km is paved and the surface conditions are poor.

(3) Sub-zone 3 (Seghe)

1) Fish marketing facilities

There is one Fisheries Center in Seghe and an ice-making facility built by SDA in Mbatua village.

a. Seghe Fisheries Center

This center was built with Japanese government assistance in 1983 and it was operated by the local fishermen association. However, due to a breakdown of the ice-making machine in 1989 and with no means of transporting its fish, the center's activities were terminated.

Recently, it was informally selected as a candidate site for the second phase of a RFEP project by EC, slated to begin in 1994. If the project is implemented, the facility will be renovated and fish marketing activities utilizing regular transport services by the passenger/cargo ship, Ramos II, will begin; and the center will be actively utilized. The existing facilities are given below. The refrigerator and one generator is in operable condition.

- Ice-making machine: 600kg/day (12kg x 24 blocks x 2 times), cube ice
- Refrigerator: 5 mt (-25°C)
- Generator: 20KVA x 2, 5KVA x 1

b. SDA ice-making facility

Although SDA fish marketing activities are carried out in Batona, the existing ice-making machine is small in scope and the exact details are not known.

2) Related infrastructure

a. Electricity

Electricity is not available throughout the Seghe area and the Fisheries Center possesses the only power generator.

b. Water supply

Although the coastal villages have tap water facilities, a water shortage occurs when the water level of the dam drops and water pressure disappears. The Fisheries Center is dependent on rain water, but there is an abundant, good quality water source in the bush behind the center.

c. Harbor facilities

In the village of Patotiba on opposite shore from the Fisheries Center, there is a stone jetty where the transport ships traveling between islands dock. There are stone jetties in areas where there is a Fisheries Center, airport, hospital, and churches, but they can only be utilized by boats.

d. Airport

There is an airport with a 600m runway in Seghe and there are two regular flights a week between Honiara and Gizo.

e. Roads

There is only one tractor road running between the Seghe airport, hospital, and church which is capable of accommodating motor vehicles. There are only footpaths between villages and the common form of travel is by boat.

4 PRESENT CONDITION OF MODEL ZONE 4

This zone encompasses only the island of Rennell.

4.1 Background of Rennell Island

(1) Geographical and topographical characteristics

Rennell Island stretches approximately 80km from east to west, 10km from north to south, and encompasses an area of about 651km². It is created from elevated coral reefs and subsequently the entire island is composed of limestone. There is a large fresh water lake (Lake Te Nggano in the eastern area of the island and it is surrounded by steep cliffs of 100m to 200m. The coastal areas are unsuited for homes and crop cultivation and access to and from the ocean is greatly impeded. However, the inland area forms a moderately inclined basin (Fig. III.4.1.1).

The island is located in a tropical monsoon belt and its annual rainfall volume surpasses 4000mm. The rainfall tends to concentrate during the months of January to March, with very little rain during the remaining months of the year often causing a water shortage or drought on the island. The average daytime temperature is about 30°C and its temperature and humidity are higher than Honiara.

Its impermeable limestone surface has impeded the growth of a tropical rainforest and many of its trees are short with a diameter averaging 30cm to 50cm. Subsequently, the island is poor in forestry resources, and development of a logging or forestry industry is not anticipated.

In addition, agricultural development is also restricted since soil accumulation is found only in topographically depressed areas. In 1985 and 1986 only 22 mt and 5 mt, respectively, of the principal cash crop copra was produced which was equivalent to only 0.2 percent and 0.04 percent of the total production volume of copra in Central Province.

In the area of mining resources, bauxite was mined by a foreign firm in 1970, producing high quality bauxite and phosphorus, but due to international market prices the operation proved unviable and has been discontinued.

Although the island's fishery resources are abundant in diversal and demersal fish and shellfish (shrimp, crab), the island has a subsistent economy and there is no consumption market. Due to its geographically remote location from Honiara and irregular ocean transport system, the island remains largely undeveloped.

Rennell Island's remote location has made it a haven for rare bird species, reptiles, and plants; and it has been selected as a candidate designation as a United Nations World Heritage site.

(2) Socio-economy

1) Special characteristics of its society

The majority of the island inhabitants are Polynesians with an estimated population of about 1,056 people in 1992. According to the 1986 census, there were 1,084 people (194 households), 1,132 people in 1976, and during the ten year period from 1976 to 1986, a population decrease of 49 people (about 4 percent) was recorded. It is estimated that there was a further decrease of about 28 people (roughly 3 percent) during the five year period from 1986 to 1992.

Tinggoa located in the central western part of the island near the airport, has been the acting capital for this new province (a capital has not been officially designated, and it is currently under deliberation by the Agricultural Land Ministry).

There are a total of ten villages throughout the island, of which four are located near Tinggoa, but the remainder of the villages are scattered along the road running through the center of the island. There are four villages along the west coast of Lake Te Naggno in eastern Rennell.

The villages are comprised of clans with one chief for each clan and one high chief is selected to represent all the chiefs of the village to coordinate and oversee its communal activities. The position of chief is hereditary for clans and villages.

Land is jointly owned according to traditional customary land ownership laws. Land which is owned by the province is limited to the Tinggoa District containing the airport. The Fisheries Center in the coastal area of Lavanggu (about 150m²) has been leased for a 20 year period by the provincial government from the landowner.

Reef rights are also determined according to the practice of customary land ownership, but they are used freely among villagers engaged in subsistent fishing. However, use of the reefs for commercial fishing is restricted. Offshore reefs are considered free fishing grounds.

2) Industry, economy, lifestyles

All sectors of industry are as yet undeveloped and food and daily commodities are sold by petty businesses. The livelihood of its inhabitants are supported by subsistent cultivation of root crops, fruits, vegetables and fishing along the coast or at Lake Tenggano. However, due to the lack of soil suitable for cultivation, the island suffers from a constant food shortage.

Cash income to purchase food and daily commodities is earned through handicrafts such as basket weaving with pandanus leaves, woodcarving, etc. and copra production.

Fishing activities are actively carried out by only Lavanggu village bordering Kangaba harbor and its small neighboring villages. The remaining villages are located inland, two and a half to four hours away from the coast on foot; and this factor has greatly restricted fisheries. However, all villages possess three to four outrigger canoes on the coast where the younger village members occasionally engage in fishing activities. The fish harvested by these periodic forays is for subsistent consumption and it is sometimes freely distributed among villagers.

(3) Major Districts of the Island

Prior to its recent independence as a province, the island was largely divided into the two wards of western (population 640 in 1986) and eastern Rennell (population 440 in 1986). However, after gaining its independence the island has been divided into the six wards of Mugihenua, Tetaungagoto, Tinggoa, Kanaba, Matangi, Kangaba, and Tenggano. The major areas with relatively large populations are Tinggoa Ward containing the airport and the acting capital, Matangi Ward containing Lavanggu village, and Tenggano Ward bordering Lake Tenggano.

1) Tinggoa Ward

The airport, Solomon Airways office, the provincial government assembly hall, guest house, police station, and housing for provincial government workers, etc. are located in the Tinggoa Ward. The provincial government has leased a one room office from Solomon Airways as its administration office. In the past there was also a clinic, but it was destroyed by the Cyclone Nina in 1993; and presently, the assembly hall serves as a temporary clinic (Fig. III.4.1.2).

The four to five neighboring villages of Tinggoa, Hatagua, etc. were also devastated by the cyclone and villagers live in houses temporarily restored with waterproof tents and hastily built walls.

A very small segment of the population are employed by the provincial government or have skilled jobs such as carpentering. The majority eke out a traditional lifestyle based on subsistent agriculture of root crops and vegetables. Since the coast is four hours away on foot, fishing is carried out only periodically by the younger generation. Before the advent of Cyclone 20, copra production was also carried out, but it is currently at a standstill due to the devastation wrought by Cyclone Nina.

Drinking water is largely dependent on rain water, but due to destroyed water tanks, water collected in nearby caves is used as drinking water.

2) Lavanggu village in Matangi Ward

Lavanggu village is built on a coastal terrace bordering Kanganba harbor, consisting of approximately 40 households and three clans.

The Fisheries Center and the office and private home of the Renvel Fishery Co, a fresh fish marketing firm, are located at the foot of the terrace in the beach area. There are plans to install an ice-making machine at the Fisheries Center this year.

Homes here have also been devastated by the cyclone and they have only been temporarily restored. As a result, housing and water conditions are poor.

Fisheries are actively carried out by this village and aside from Saturdays and Sundays or bad weather conditions, the majority of its inhabitants are engaged in fishing. However, it is petty fisheries with much of the fishing being carried out by hook and line or diving from outrigger canoes. Fishing gear is primitive and diversal fish is harvested using psuedo-bait like young coconut leaves or small stones as weights. However, fishery resources are abundant and despite simple fishing gear, approximately 10kg to 20kg are harvested per operation.

In addition, shark fishing for fins is also carried out. Lobster, beche de mer, and shellfish are also harvested by diving (however, giant clam fishing has been voluntarily restricted for a two year period).

Although a segment of the production volume is harvested for self-subsistence, fish is also marketed to Tinggoa village in the west as well as to other inland villages, it is bartered and marketed by a local fisheries company. However, the refrigerator of Renvel Co. is often inoperable and it is surmised that its distribution volume is nominal.

Subsequently, in view of the aforementioned, Lavanggu village is a source of protein supply. Although its fishery resources are as yet undeveloped, its future potential to earn foreign currency is significant.

Presently, fishing boats and gear are primitive (FRP boats are owned only by Rennell Fisheries, the provincial government, and the Fisheries Center) and infrastructure such as electricity which is essential in preserving and maintaining fish quality is undeveloped. The cargo/passenger ship arrives only once every five to seven weeks from Honiara, due to the island's remote location; and inland distribution of fish is dependent on the island's one tractor. Subsequently, developing a transport system is an important issue in fisheries development.

3) Tengano Ward

There are four villages, Niupano, Tengano, Hutuna, etc. scattered along the west coast of the fresh water lake, Tengano. There is only one footpath passing through the steep inclines of the rainforest belt from the anchorage area of Kangaba harbor to this area; and it is the most isolated district of the island. Tengano village is the focal point of this area and there was a provincial clinic before its destruction by the cyclone. The livelihood of its inhabitants is based on subsistent agriculture and fishing.

The area is dominated by Lake Te Nggano which covers an area of 130km² and has a depth of 42 meters. It is the habitat of eels and tilapia. Villagers maintain dugout canoes around the lake and harvest tilapia using gill nets set in the shallow areas of the lake. Tilapia is harvested for self-consumption and a small volume is sent from Lavanggu village to Tinggoa Ward.

The environment surrounding the lake contains many of the island's rare plants and animals and development of a tourist industry which will not destroy this precious natural environment is the hope cherished by the local inhabitants and the provincial government.

(4) Infrastructure

Improvements in the socio-economy of Rennell Island is shown in Fig.III.4.1.1.

1) Capital

The Rennell and Bellona Islands gained its independence from Central Province as Rennell/Bellona Province in March 1993. Tinggoa, Lavanggu, and Kanaba wards are the proposed capital and each ward has a relatively high concentration of population. However, in view of future development and land

use plans, etc. the provincial government and the Ministry of Agricultural Land are currently deliberating the official location of the capital. The island is largely divided between the east and west and Tinggoa Ward is anticipated to be selected as the official capital in view of its water resources, existing infrastructure, traffic, etc.

2) Electricity

There is no power generator on the island; and there are only three small, portable electric generators and one small solar powered generator in Tinggoa Ward. There are only a few portable generators in the other areas and the use of electricity is limited to communication, ice-making equipment, etc. and there is no electricity for lights. Aside from the solar powered generator, the other generators are dependent on diesel and gasoline as fuel. If there is a fuel shortage, there is no emergency supply of electricity.

3) Water supply conditions and facilities

Although the annual rainfall volume is 4000mm, the rains are concentrated during the months of January and March. Due to the island's karstic topography, there are no rivers and surface water is scarce. Rainwater is the basic water source of the inhabitants and when rainfall is sparse, cave water and underground streams in the coastal areas are utilized.

Although villages have developed in areas with caves and underground streams, a manual pump well is located 7km east of Tinggoa. There are remains of a well and a pump on the provincial government land of Tinggao in the aftermath of the cyclone, but they have not been replaced. In addition, the rainwater tanks of homes have nearly all been destroyed by the cyclone.

Despite the simple lifestyle of its inhabitants, the use of rainwater has been restricted in the aftermath of the cyclone, and skin disease is on the rise due to poor sanitary conditions.

4) Transport

a. Air transport

Regular flight service between Rennell Island and Honiara City commenced in 1970 with the completion of the runway in Tinggoa Ward. Presently there are two flights weekly (8 passenger plane) transporting passengers between these two areas. Although the runway is overrun with weeds, rainwater drainage is good. There are no runway lights or outdoor illumination and planes depart during afternoon hours.

b. Land transport

There is an unpaved road two to three meters wide from Kaagua in the northwest to Lavanggu via Tinggoa. Although it is wide enough to accommodate one tractor, it passes through swampland and it is steeply inclined in some areas. The tractor owned by the provincial government is unable to ascend the steep inclines and in areas where the road rises steeply, one or two people are required to sit on the tires to give it added ballast. The road foundation is made of limestone and it has been hardened by the tractor and its overall surface is in good condition.

In the eastern area of the island, a road is presently under construction with EC assistance which runs from Lavanggu to Teat near Lake Te Nggano. Upon its completion, it will cut across the island from east to west, eliminating the need to depend on the coastal route between Kanggava Bay and Tuhunggango.

In addition to these roads, there is a road capable of accommodating a farm tractor stretching about six kilometers east from Tengano to Tahanuku and Lughugi Bay. However, the steep inclines of the coastal road make it difficult climbing even for an unloaded tractor.

c. Transport vehicles

There are two government owned tractors and three dump trucks used in road construction on the island, but at the time of this survey only one tractor was in operation. This tractor transports inhabitants and goods once a day between Kagua and Lavanggu. The tractor consumes eight gallons of gasoline a day, but due to a fuel shortage, its operational ratio is low. In particular, when the regular cargo/passenger ship is late, the entire island suffers from a fuel shortage and power generators and kerosene lamps cannot be used.

Spare parts for tractor are also in shortage and there is no repair workshop to cope with unexpected breakdowns.

d. Harbor/navigational route

Presently, there are no harbor facilities on the island. Lughugi Bay, Kanggava Bay, and Tuhuggona Bay are used as anchorage sites for boats, but there are no jetties or wharves. Cargo is landed from ships moored outside the barrier reefs using small boats, canoes, and swimmers moving between the shore and the ships.

The three bays are categorized and utilized according to wind direction, wave conditions, and cargo. The lack of cargo landing facilities is one of the

factors contributing to the lagging socio-economic development of the inland areas.

Currently, daily commodities of the inhabitants are transported by passenger ships or government passenger/cargo ships which arrive once every five to seven weeks. It normally requires five days to navigate the distance from Honiara to Bellona to Rennell (Fig. III.4.1.3). Important cargo is landed at Lughugi Bay by barge and the regular passenger/cargo ships anchor at Kanggava and Tuhuggona bays.

e. Loading/Unloading Cargo in Kanggava Bay

Lavanggu village along the Kanggava Bay is the only connecting gateway to the other islands via the passenger and cargo ship docking there. In addition, it is located midway between eastern and western Rennell and it is a transport and administrative center (Fig.III.4.1.4).

- Cargo yard of Kanggava Bay

The homes of Lavanggu inhabitants are located on the hill facing Kanggava Bay. The Fisheries Center, Renvel Fisheries, and only a few homes are located on the shore. An unpaved steeply inclined road runs from the hill to the shore. Although undeveloped and in poor condition, there is a cargo yard for stockpiling cargo brought in by passenger ships which is large enough for a trailer tractor to maneuver.

- Analysis of cargo yard facilities

Presently there are four government owned cargo/passenger ships connecting Rennell, Bellona, and Guadalcanal islands, in addition to Temotu and Malaita islands which arrive once every five to seven weeks.

Ship Name	Length (M)	Breadth (M)	Depth (M)	GRT	Year Built	Owner
Belama	25.4	7.32	3.36	229.50	UK 1980	SIG
Baruku	25.4	7.38	3.36	224.05	Japan 1980	SIG
Butai		7.40	3.55	184.00	Japan	SIG
Leili	21.3	6.50	2.80	102.70	Japan 1982	SIG

These ships are the largest vessels owned by the Solomon Island government. Butai and Leili suffer from constant breakdowns and their use has been greatly curtailed.

The cargo/passenger ship which connect Western Province and Guadalcanal island is a 500GRT vessel, but for the present, only the aforementioned four ships will dock in Kanggava Bay. In future docking facilities will not need to accommodate vessels of more than 500GRT.

5) Social facilities

a. Before the advent of the Cyclone Nina, there was a medical clinic in Tinggoa and Tengano and aid posts in Kagua, Tahanuku, and Lavanggu. However, all facilities were destroyed and currently there is only one temporary provincial clinic in Tengano with one health worker. Nearly all of the children on the island suffer from parasites and malnutrition in the aftermath of the cyclone and a shortage of medical facilities. There were originally seven elementary schools on the island which were all destroyed by the cyclone. Presently, classes are conducted in temporary canvas covered buildings.

b. Communication

There are a total of six wireless radios, including one solar battery powered telephone owned by Solomon Airlines on the island. These radios allow communication between each of the inland areas of the island and with the capital, but many are depreciated and their total number is insufficient. This has impeded communication between the island and other areas.

(5) Natural Conditions of Kanggava Bay

There is no reliable data on weather and ocean conditions. However, based on available data and information collected from the field survey, the characteristics of Kanggava Bay were compiled and they are delineated below.

1) Land and coastline characteristics

The southwest area of Kanggava Bay is exposed and faces the open sea. The coastline is comprised of a hill approximately 70m to 80m in height which stretches about 100m to 200m to the tip of the barrier reef; and they are reef flats with a depth of 7m to 9m. The 100m to 200m area which stretches from the tip of the barrier reef to the offshore waters has a depth of 7m to 9m and its bottom floor consists of 1.0m of accumulated coral sand. There is a so-called second barrier

reef or sea mound near this area (width 100m-50m) which is a build-up of coral; and the water depth drops suddenly beyond this area.

2) Natural Conditions

a. Wind direction, velocity, wave conditions

According to existing data, the trade winds blow in a southeasterly direction. Wave and wind conditions most disadvantageous to the proposed site for harbor facilities is the area $S12^{\circ} E - S56^{\circ} W$ where the bay merges with the open sea. The frequency of winds blowing from this direction is about 20 percent. If it is estimated that the wind blows in this direction more than five to six times per year (wind velocity 8.0 - 13.8m/sec), its frequency rate is about 5 percent throughout the year.

If it is assumed that the wind direction of the waves is the same as offshore waves, then the waves in this area usually originate from a southeasterly direction. It was zero for the remaining months.

It is estimated that winds traveling in a SSE to SW direction seldom occur in Kanggava Bay. According to information obtained from the field survey, when the emergency assistance boat arrived in the aftermath of Cyclone Nina, the docking area was moved to the eastern and western areas of the bay in order to avoid the effect of the waves. A survey and analysis of ocean conditions during the rough cyclone seasons are essential when designing harbor facilities.

b. Tidal current, ebb and flow

The tidal current flows from NE to SE along the coast of Lavanggu which reverses direction during the high tide and flows counterclockwise in the bay. Although the tidal current near the mouth of the bay changes according to the seasons, the tidal current is large near the cape on the southern side of Kanggava Bay according to fishermen.

(High tide level in Kanggava Bay)

H.H.W.L	+ 0.898
H.W.O.S.T.	+ 0.586
M.S.L.	+ 0.449
L.W. O.S.T.	+ 0.312
C.D.L	+ 0.00

Source: JICA Study in Rennel Island, 1976

(6) Damages by Cyclone Nina and Renovation Plans

Rennell Island lies in the path of cyclones and it has been devastated by Cyclone Namu in 1986 and most recently by Cyclone Nina in January 1993. In particular, the damage wrought by Nina was great, completely destroying the island's seven elementary schools, two medical clinics, and homes as well as damaging stable food supplies such as root crops, coconuts, vegetables, fruits, etc. as shown below.

Sectors	Estimated Cost (SI\$)	Damages
Food crop	69,750	232 household affected
Coconut	855,000	450 hectares
Primary school	1,430,600	Nine schools (major damage and 1 school (minor damage), 20 staff houses
Clinic/Aidpost	456,583	Three clinics and three staff house
Water supply	194,826	40 rain catchment
Public buildings	237,800	Police & provincial office, court building, etc.
Road	245,000	Two points
Housing	117,463	332 houses (completely) 212 (partly damaged)

Source: Report of the Technical Advisory Team on Cyclone Nina Damage and Proposed Rehabilitation Programme, National Disaster Council, 1993.

As a result, the island faced a severe food crisis, relying on seed potatoes or wild taro in the direct aftermath of the cyclone. Although at present, conditions have somewhat improved with the production of root crops showing signs of recovery, all island inhabitants are living in temporary shelters, using tents as walls and roofing. There is a water shortage stemming from destroyed rainwater tanks and medical facilities are deficient. The islanders are still faced with difficulties in their daily lives.

Although plans to regenerate the island have been proposed by the disaster committee established by the Solomon Island government, the UK assistance project, Rural Primary Health Care Project, is planning to construct two medical clinics (including medical equipment, medicine, communication equipment, sanitary facilities) with two nursing staff members. Construction capital (approximately SI\$540,000) has been given to the Solomon Island government and construction is waiting to begin. In addition, a plan to rebuild the seven elementary schools with EC assistance is underway.

However, due to insufficient provincial government finances, quick recovery of the agricultural and fisheries sector, and infrastructure such as roads, homes, government buildings, etc. is difficult.

A development and recovery plan that targets an improved lifestyle for its inhabitants is desired.

4.2 Existing Development Plans and Foreign Assistance Projects

Although no new projects have been established by the new provincial government, development projects implemented by the central government and related development plans are explained below.

(1) Central Province Development Plan (1988-1992)

This development plan was formulated when the two islands of Rennell and Bellona were a part of Central Province and it targets natural resources, regional social improvements, commerce, manufacturing, and tourist industries. Improvements pertaining to Rennell Bellona islands are listed below.

- 1) Extend the road from Lavanggu to the lake area in eastern Rennell (construction has begun with EC assistance).
- 2) Construct a Fisheries Center in Lavanggu and install an ice-making machine and refrigeration facilities. Establish transport services connecting Rennell and Bellona islands. (The Fisheries Center has been built and a small FRP boat has been installed. The ice-making machine and the diesel power generator will be installed by Fisheries Division in the beginning of 1994. The personnel in charge of the center's operations has completed his technical training under OFCF in Japan and he is presently preparing a technical training course for fishermen. The plan to provide transport which will connect Rennell and Bellona islands is still undecided.)
- 3) Construct port facilities at Lavanggu (remains unexpedited).
- 4) Install a trailer tractor in the eastern and western areas of Rennell Island after road construction has been completed in east Rennell (remains unexpedited)
- 5) Construct an airport in eastern Rennell after road construction in this area has been completed (as yet unexpedited).
- 6) Establish a lumber mill in western Rennell to service both Rennell and Bellona islands (a small-scale lumber mill now exists in western Rennell and although its output is small, it is supplying wood to rebuild cyclone damaged areas.)
- 7) Develop resorts in the natural resource rich Lake Te Nggano area in eastern Rennell Island.
- 8) Develop agriculture in Rennell and Bellona islands.

- 9) Construct airport facilities of Bellona island (unexpedited).
 - 10) Increase and train personnel required to develop fisheries and the agriculture sectors in Rennell and Bellona islands (except for one personnel managing the Lavanggu Fisheries Center).
- (2) European Community (EC) funded project
- 1) This project is included in the Central Province Development Plan (1988-1992); and currently a road running from Lavanggu to the lake area of eastern Rennell is under construction.
 - 2) Funds to rebuild the elementary schools on Rennell and Bellona islands which were destroyed by Cyclone Nina (January 1993) have been provided (a total of 10 elementary schools; seven on Rennell Island and three on Bellona Island).
- (3) United Kingdom (UK) Aid Project
- 1) Funds to rebuild facilities damaged by Cyclone Nina have been provided by UK. All medical clinics and First Aid posts have been destroyed by the cyclone. One temporary clinic has been set up in Tinggoa Ward in the provincial government assembly hall.
 - Medical clinic: Rennell Island - 2 locations (Tinggoa, Tengano), Bellona Island - 1 location (total of 3 locations)
 - Homes for nurses: 2 locations
 - Basic medical equipment for clinic: one set at each facility
 - Solar powered system: Installed on the rooftop, wireless radio
 - 2) Other development projects and submitted reports

The following list of development projects and reports have been compiled to acknowledge Rennell Island as a World Heritage Site and an environmentally protected area. Their proposals recommend sustainable development policies that take the area's environmental potential into consideration.

 - a) Solomon Islands Tourism Development Plan, 1991-2000 (Ministry of Tourism and Aviation, Government of Solomon Islands Tourism Council of the South Pacific, December 1990)
 - b) Solomon Islands World Heritage Site Proposal, Fact Finding Mission, Feb. 1990. (John Mckinnon, Department of Geography Victoria University of Wellington, March 1990)

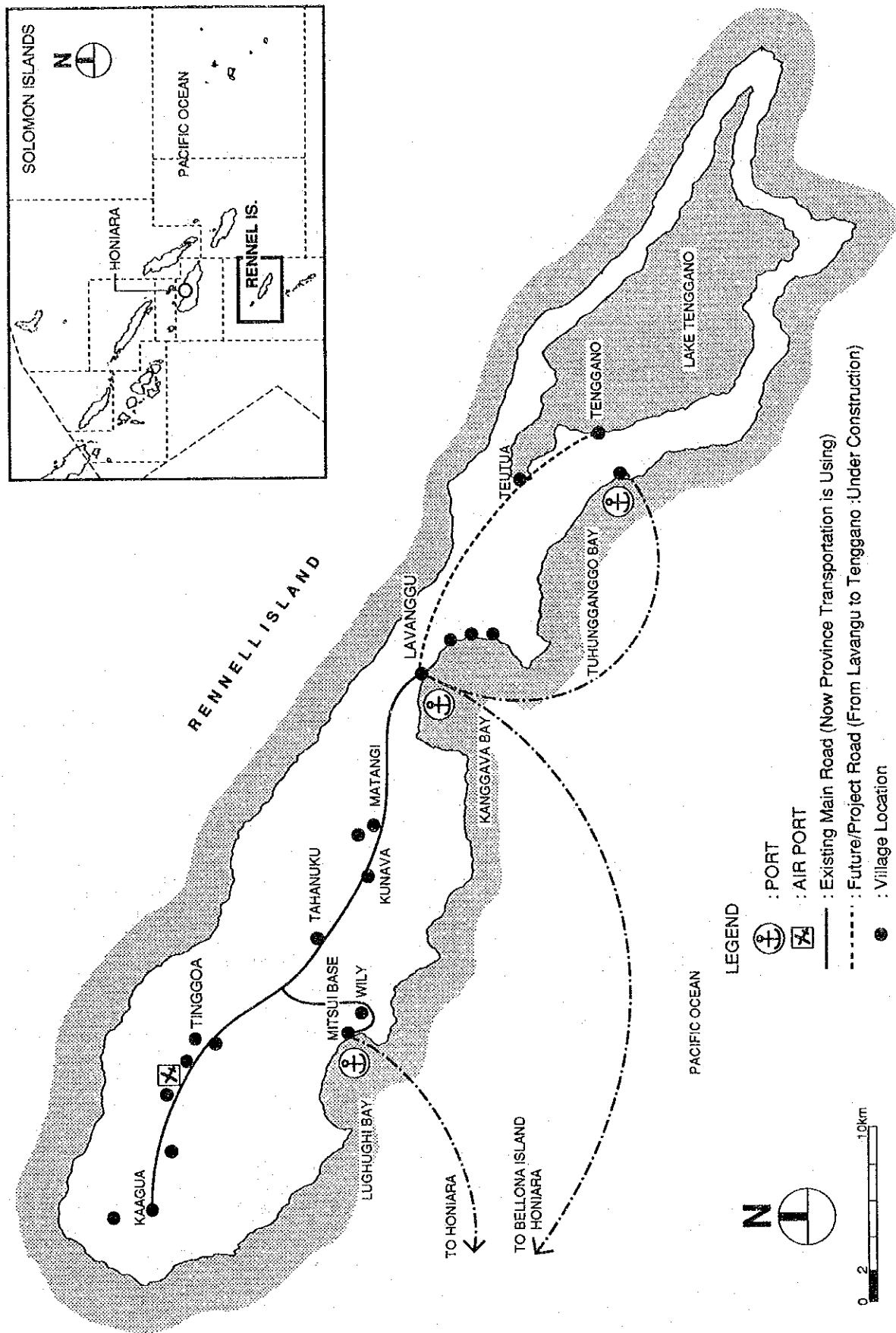


Fig. III.4.1.1 Map of Existing Infrastructure in Rennell Island

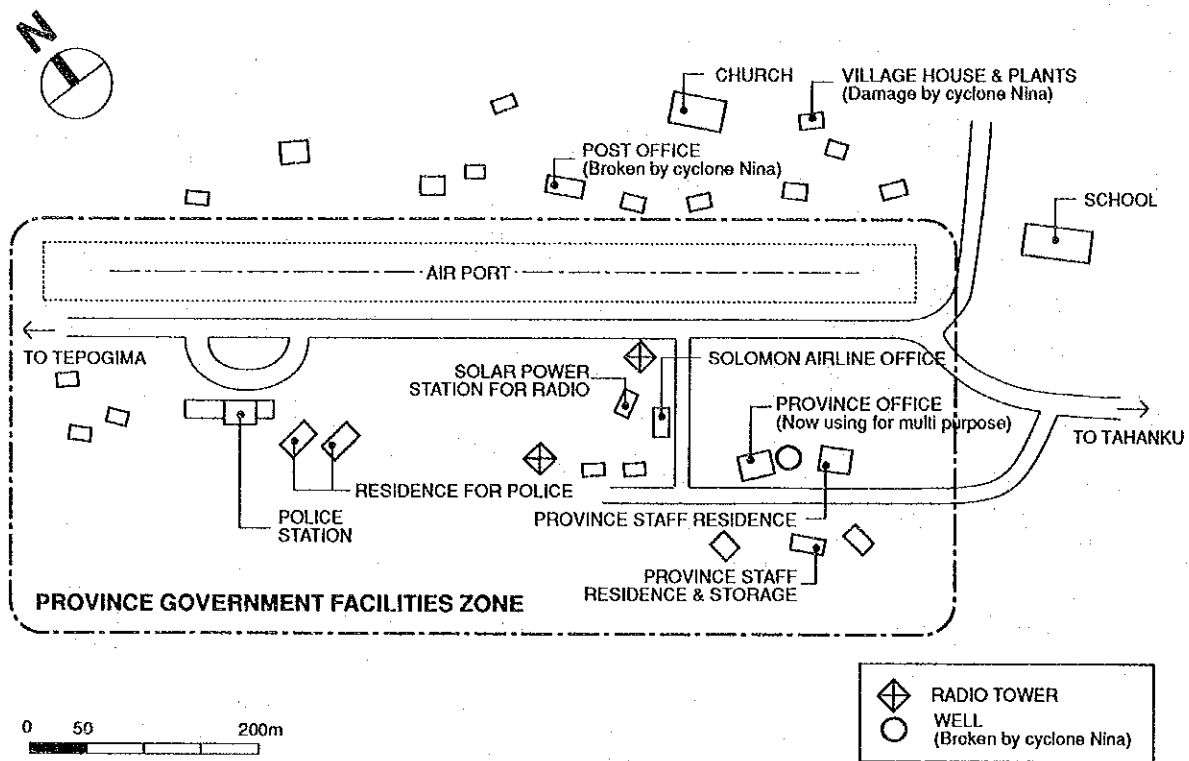


Fig. III.4.1.2 Location Map of Government Facilities in Tinggoa

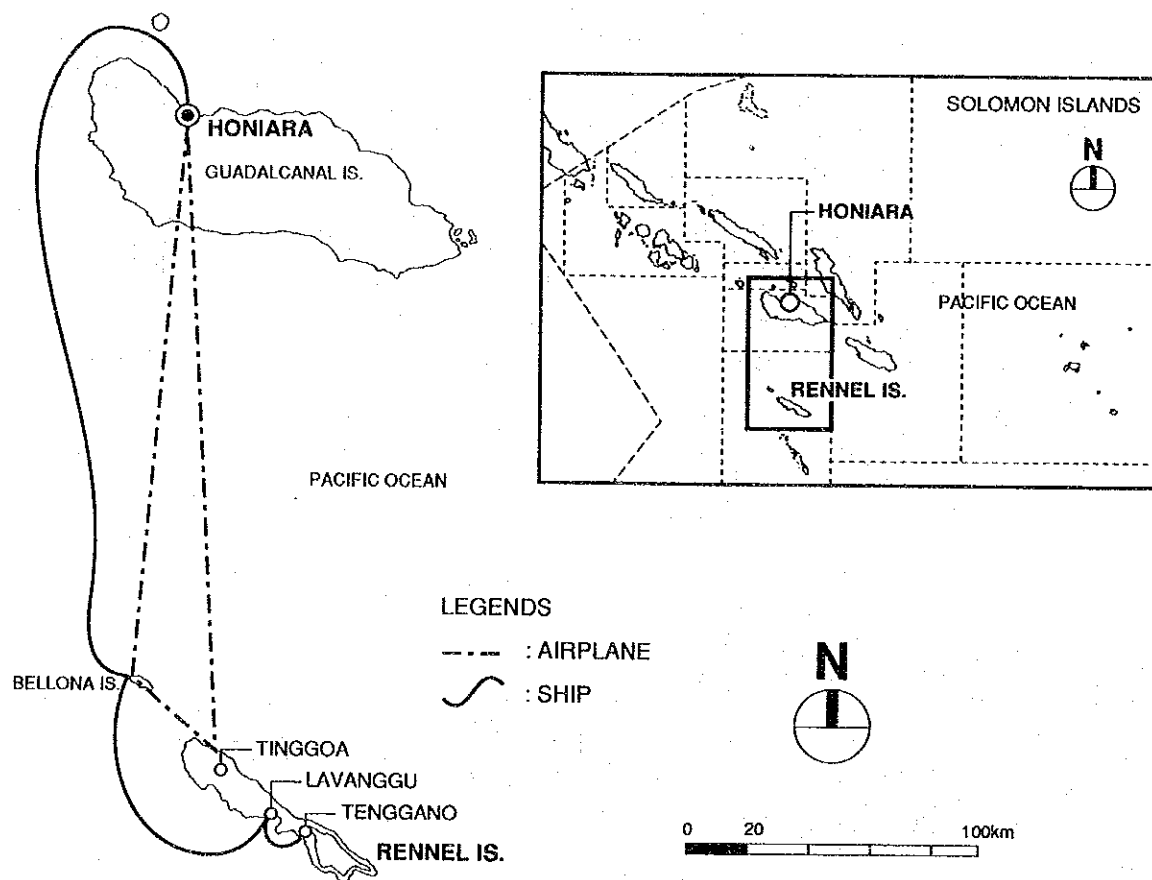


Fig. III.4.1.3 Transportation Route Between Honiara and Rennell Island

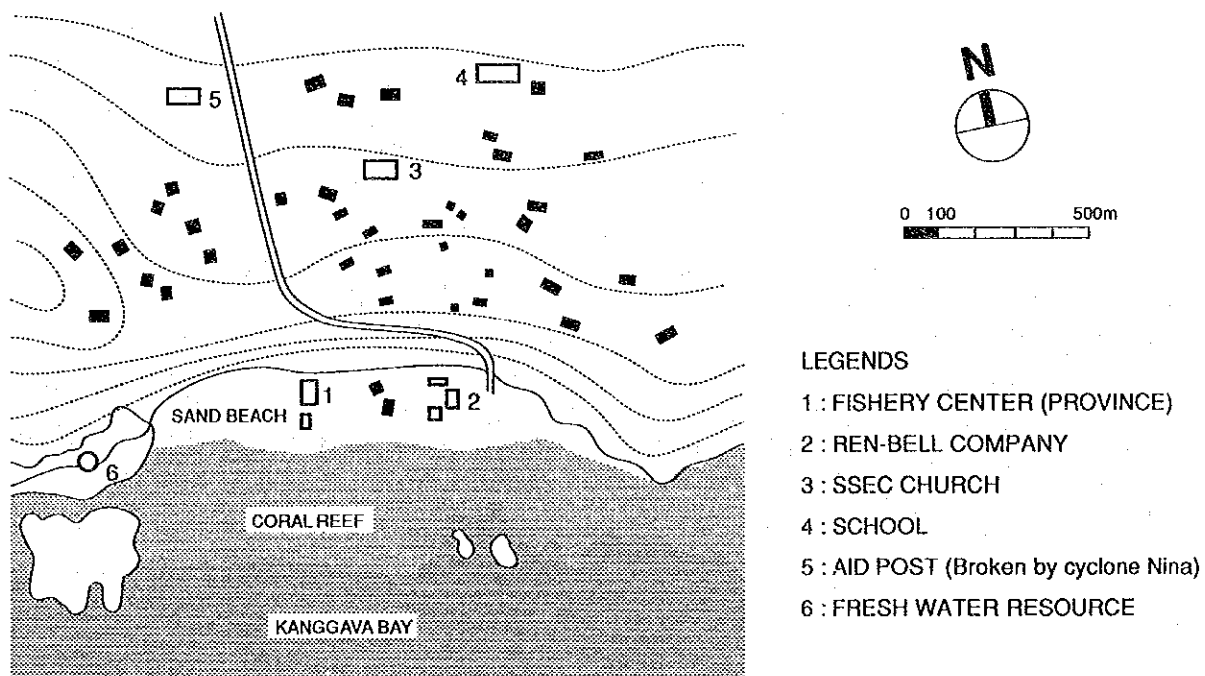


Fig. III.4.1.4 Lavangu Village and Kanggava Bay

IV. PLANNING

1. DEVELOPMENT POLICY

The objective of this plan is to promote small-scale commercial fisheries through improvements in the fish marketing network, in order to improve the living standards of the village inhabitants engaged in fishing activities. The project will bear the following factors in mind, in accordance with this objective. Project target years will be set for 1995, 2000 and 2010.

- (1) Formulate a project that is suited to the national economic growth.
- (2) Effectively utilize the existing transport system.
- (3) Promote private sector participation in stages, in order to achieve continuous operations.
- (4) Adequately reflect the requirements and opinions of the inhabitants.
- (5) Avoid abrupt transitions in fish marketing patterns.
- (6) Utilize the existing fish marketing facilities and related infrastructure as much as possible.
- (7) Improve the fish marketing network between the production and consumption areas.

2. NATIONAL PLAN

- (1) Plan on supply/demand of fishery products

The balance in the volume of supply and demand between areas will be formulated in accordance with the ratio of local subsistent fisheries, local consumption volume, fish marketing over a wide area, and fish exports.

- (2) Effective use of private sector participation

In principle, the national and provincial governments and other organizations will be left to develop a system encompassing fish production to final consumption. Autonomous operation of the system by the private sector will be gradually instituted in accordance with the following.

- 1) Fish production stage

In principle, efforts to organize local fishermen in production areas will respect the traditional land ownership and social customs and decisions will be left to the judgement of the local inhabitants. Fishermen cooperatives in production areas are defined according to the following three categories.

- a. Areas with the potential to implement wide ranging organizational improvements.
- b. Areas where the nucleus is composed of a small number of village units (Munda).
- c. Areas with individual or family units.

2) Fish consumption and export

Although the central and provincial governments will improve conditions to promote private industries, there will be no direct intervention. Fresh fish marketing activities in Honiara and the provincial capitals will be left to the efforts of the private sector. A shipping network for fish products between fishermen and fish traders in the towns will also be supported.

3) Fish marketing and transport

A third sector will be established where public agencies, private companies, and fishery related personnel will make direct investments, sharing the responsibilities, risks and the profits.

(3) A "committee to improve fish marketing/transport" will be set up nationwide at each regional level to push forward improvements in the fish marketing and transport network. Members of the general committee will include representatives from each of the following organizations and their respective roles are clarified below. However, the committee involved in actual operations will be limited in number in order to raise operational efficiency; and the general committee will play a supportive role.

Members	National Level	Regional Level
MNR/FD		Policy formulation/Adjustment
MPGRD		
Shipping Lines (Public)	Formulate navigation plan	
Shipping Lines (Private)	Formulate navigation plan	
Fishermen Coop.		Formulate productivity plan/Operation & management plan
Local Representatives		Formulate plan on production, shipping, transport access/O&M
STL/NFD	Formulate production, marketing, transport plan	
Exporters	Formulate export plan/compile data requested by producers	
Consumer Coop.	Data on fish by species, consumption pattern & volume (fish inflow from other areas)	
EC/OFCF/JICA	Strengthen function of head office	Operation/management of FC
SIEA	Financial assistance for O/M	
DBSI	Financing for private investment capital (production, marketing & transport)	

(4) In order to accelerate investments in the fish marketing, transport, and export sectors, grants, low interest loans, and a preferential tax system will be some of the improvement measures planned.

(5) Fisheries Act/Regulations was revised in 1987 with the assistance of FAO. The contents of this revision contain measures to promote future small-scale commercial fisheries. Therefore, it is not necessary to create new regulations pertaining to small-scale fisheries.

3. REGIONAL PLAN

3.1 Model Zone - 1 (Honiara Town)

The Model Zone - 1 (the commercial zone of Honiara) encompasses the capital, Honiara, Marau, Lambi and Yandina. The RFEP of the EC is currently underway in Marau and Yandina. Although the Fisheries Center in Lambi is not in operation, fishermen from this area market their fish catch in Honiara. Therefore, these three areas will be excluded from development measures proposed in this study and only the capital, Honiara will be targeted for development.

(1) Objective

The three retail markets, Honiara Central Market, Kukum Market, and Rove Market, administered by the Honiara Town Council supply food, produce, fish, etc. to the inhabitants of the capital and its outlying areas. Of the three, the Honiara Central Market is the largest in scope and volume of handling cargo and it has played a significant role in transforming the capital into a commercial center.

However in recent years, the Honiara Central Market is no longer able to cope with the needs of consumers in terms of land area, facility, content, and scope due to the rapidly increasing population of the capital. Products sold in this market are brought in from other islands as well as Guadalcanal Province; and it is the nation's foremost distribution point which connects the production areas to the largest consumption area. An active market facility is anticipated to play a greater role in developing an overall marketing system.

The objectives targeted in the development of the Central Market are outlined below.

- 1) Transform the market into a distribution point servicing the nation's largest consumption area.

- 2) Establish the market as a commercial base facility of the capital.
 - 3) Establish a multi-market system able to cope with future rapid population growth.
 - 4) Establish the Central Market as a distribution center with effective and efficient marketing functions, including administration of the other two markets.
- (2) Development strategy

The Central Market is located in the center of the capital and lies between Mendana Avenue and the coast. As of 1993, approximately 25,000 people visit the market daily. Subsequently, renovations of the market are closely tied to improvements in city functions; and market renovations must take the following factors into consideration.

- 1) Improved market functions will allow the facility to cope with the rise in Honiara's population.
- 2) Unlike ordinary supermarkets in the town, the Central Market will deal in direct marketing of products from production areas.
- 3) The Central Market's functions will emphasize its position as a distribution center by receiving goods which are directly shipped from other islands.
- 4) The Central Market's location which gives the market direct access to the towns major road and the coast will be utilized to its fullest advantage.
- 5) The plan will coordinate with pertinent projects currently under implementation.
- 6) The plan will be implemented in gradual stages, in order to avoid impeding overall functions.
- 7) The plan will allow the market flexibility in coping with future commercial functions and it will avoid unnecessary modernization.
- 8) Due to limited market land space, facilities will be arranged rationally.

(3) Scope of development

- 1) Supply of fish products to Honiara

The projected volumes of fishproducts to Honiara in 1995, 2000 and 2010 are shown in Fig. IV. 3.1.1. The estimated supply of fish products (fresh fish, frozen fish and canned fish) is 2,223 mt in 1995, 2,575 mt in 2000 and 3,296 mt in 2010. Fresh fish is mainly supplied by individual fishermen and it contributes to 20

percent of the fish products in 1995 and 2000. Fresh fish volume increases to 26 percent (861 mt) in 2010 of the total (3,296 mt).

The estimated supply volume of frozen fish (tuna and skipjack) are 901 mt in 1995 and 1,120 mt in 2010, and they are mainly from STL and NFD. The estimated canned fish volume produced locally by STL are 887 mt in 1995 and 1,315 mt in 2010.

The supply volume of fresh fish by provinces to Honiara is shown in Fig. IV.3.1.2. Of the total of 435 mt of fresh fish in 1995, about 60 percent (258 mt) is from the Central Province and the remaining from Isabel, Gadacanal, Choiseul, Malaita and Western provinces. In 2010, the fresh fish supply from Central Province increases to 65 percent (560 mt) of the total of 861 mt.

The expected handling volume of fresh fish by the agency, excluding those fresh fish from Choiseul Province, at the Honiara Central Market is 397 mt in 1995, 460 mt in 2000 and 795 mt in 2010

2) Scope of development

The scope of the project was determined based on an analysis of current market conditions and issues, use of market space, zoning of facility locations, and a study on future changes in market functions. The planned capacity of Honiara Central Market is shown in Table IV.3.1.1.

(4) Zoning

In view of current conditions in market utilization, market facilities which have been leased to the private sector hamper visitors' access in the market. In particular, low activity level is conspicuous in the wide area which is removed from the main entrance. In addition, the parking area is congested with vehicles transporting produce and customers' cars. Produce is displayed near the visitors' entrance (parking area) since retailers try to avoid areas with less customers, which further adds to the confusion and lowers activity within the market compound.

Measures to resolve this situation are given below and the route plan is shown in Fig. IV.3.1.3

1) Route plan

- a. Separate the access used by transport and service vehicles and the access road used by customers' cars.

- b. Separate the entrance and exit for vehicles. (This will be coordinated with plans to improve Mendana Avenue and install a traffic signal).
 - c. Fish will be unloaded from boats on the coastal side of the market. (A wharf with boat ramp which will be built with Japanese government assistance, will be completed in 1994).
- 2) Zoning
 - a. The market and service facilities will be separated into open and closed zones. The open zone will contain the roofed areas and the closed zone will encompass the roofed and walled enclosures.
 - b. The service zone reserved for transporters will be removed from the customer access ways and the market zone will be placed nearby.
 - c. The market and parking area will be placed in the same open zone. The parking area can be closed off and used as an open market and market hall for events, etc.
- (5) Facility improvements
 - 1) Major facilities

The major facilities of the Honiara Central Market are given below.

 - a. Market Hall: The market hall will be built without walls to provide open space and shade. Display tables and benches will be placed in appropriate areas. An area for handling goods and public toilets will be installed on both sides of the hall.
 - b. Fish market: An open shade fish market will be built in the area of the wharf apron which will be built under Japanese government assistance. Display tables and benches will be placed in appropriate areas. During the first phase of the project, fish will be sold in eskys, but after a fish marketing organization has been established, fish will be sold in refrigerated display cases.
 - c. Service Facility A: Ice-making machine, ice/cold storage, esky storeroom, temporary storage facility for produce, cargo handling area, employee office, toilet and utility room, storage for cleaning equipment, temporary storage room for fishing boat engines and gear, and garbage collection area.
 - d. Service Facility B: Market administration office, storage room for administrative equipment and event paraphernalia, conference room.

- e. Market service facilities: The existing ice-cream shop, fast food store, handicrafts and daily commodity shops will be included. An information counter will be set up to provide market information to customers. In particular, an information network will be established to coordinate and support the functions of all three Honiara markets (Central Market, Kukum and Rove markets).
 - f. Exterior renovations: Pave the parking area (install parking stops, shrubbery), install a sidewalk,, rain gutters.
 - g. Water supply and drainage: Water supply facility, drainage facility, washing facility. Waste water (toilet & market wash water) treatment facilities (sedimentation pit)
 - h. Electricity: Outside lights, power facilities for ice making and cold storage
 - i. Equipment A : Hand lift, inspection equipment, others
(for use of market operation)
 - j. Equipment B (for market operations): administrative equipment (including data processing equipment), quality inspection equipment, equipment for events, double cab, pickup truck, fire extinguisher, security alarm.
- 2) Scope and structure of major facilities
- The scope and structure of major facilities is shown in Table IV.3.1.2.
- (6) Organization/system
- 1) Objective of improved organization/system
- A Honiara Fish Marketing Authority (HFMA) will be set up to oversee fresh fish wholesale and retail marketing and transport functions. Enabling the HFMA to take charge of fresh fish transport and marketing activities, will allow fishermen to expand their fishing opportunities, establish a marketing system, a stable supply of fresh fish, and will promote improved fish quality in keeping with consumer demand.
- 2) Summary of HFMA
- a. Organizational structure and function
 - Three of the following plans are proposed for the organizational structure of this public corporation.

- The organizational structure will be decided by a "Committee on Improvements in Fish Marketing and Transport" set up by the Solomon Island government during the HFMA's initial stages; and the organizational structure will be selected from among the following three proposals.
- It is recommended that in the initial stages of the HFMA, proposal A or B is adopted and gradually changed to proposal C when the private sector has developed effective management skills.

Proposal A: A public corporation funded entirely by the government (the central government, Honiara Town Council, Central Province).

Proposal B: A public corporation funded by existing relevant public corporations and the government (the central government, Honiara Town Council, Central Province).

Proposal C: A public corporation funded by the government (the central government, Honiara Town Council), existing relevant public corporations of the provincial government, and private companies.

b. Functions

The HFMA will have the following functions.

- Major functions
 - Fresh fish transport activities (collection and transport)
 - Fresh fish wholesale activities (to retailers, exporters, processors, and large-scale consumers)
 - Fresh fish retail activities (to the general consumer)
 - Processing and export activities will be left to the private sector to allow increased private sector participation.
- Supplementary functions
 - Transport other locally produced products, daily commodities, and passengers.
 - Provide financing and assistance to motivated local fishermen.

c. Management

- Board of Directors

The Board of Directors will be in charge of the operational strategies of the HFMA.

- Management

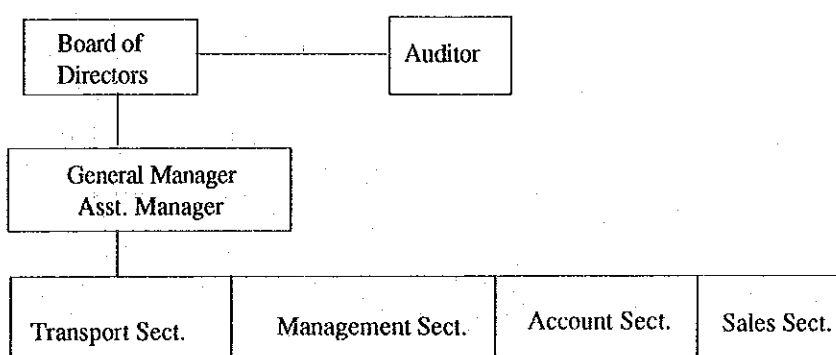
Actual management and operations of the HFMA will be carried out by the General Manager.

- Audit

The audit of company accounts will be carried out by several auditors.

- Operations

An accounting, transport, fresh fish purchasing, security, and other necessary sections will be established and qualified personnel will be employed. Initially, staff members will be recruited from the Fisheries Division, the provincial Fisheries Division, etc. and foreign assistance staff members may be needed to fill the shortage in personnel.



d. HFMA facilities, equipment

The major facilities and equipment which will be owned by the company, in order to fulfill its functions are listed below.

- Administrative office equipment/facilities

Office, office equipment (computer, copy machine, desks, chairs, stationary, etc.)

- Transport, purchasing

Fresh fish transport boat (4.5 gross ton, FRP & in-board engine), small truck, passenger car, forklift

- Retail

Fresh fish marketing area (secure space at Honiara Central Market), refrigerator, eskies

- Communication equipment

Telephone, wireless radio

e. Fish transport

- Scope of fresh fish transport activities

A fresh fish transport vessel will be purchased to transport fresh fish mainly produced by the Florida Islands to Honiara. Fresh fish transport from other areas (Marau of Guadalcanal Island, Isabel Island, Russell Islands) will be carried out according to demand and financial conditions.

- Proposed plan on collection and transport

Fresh fish collection and transport activities will be implemented in stages in conjunction with progress in these areas. Traditional fish transport methods by fishermen will be continued until HFMA operations are started and a transport ship is purchased.

The following two plans are proposed in the area of fish collection and transport. The final decision and selection of these plans will be made by "Fish Marketing/Transport Committee" after study and deliberation.

• Collection at production site

The HFMA collection boats will collect the fresh fish directly at the production site. It will collect fish at each designated fish landing site or at the first stage collection base established by fishermen groups (due to geographical factors, six sites will be set up in the Florida Islands, hereafter referred to as "rural fish collection base") and transported directly to Tulagi.

• Relay base

A fresh fish transport relay base will be set up in Tulagi, the capital of Central Province, and the HFMA transport ship will travel only between Honiara and Tulagi. In this case, fishermen will either transport their fish to Tulagi or a large FRP boat from Tulagi will collect fish from each fish landing site.

f. Fresh fish sales

In addition to direct fresh fish sales to consumers at the Honiara Central Market, wholesale transactions to retailers in Rove and Kukum markets, to Honiara hotels, restaurants, processors, exporters, etc. are planned.

(7) Layout plan

The layout plan is shown in Fig. IV.3.1.4.

(8) Future management of the project and supplementary surveys in project implementation

The improved facilities proposed in this project will allow the current market structure to cope with conditions until the year 2000. However, if this consumption and marketing structure is maintained through 2010, it is projected that the scope of the Honiara Central Market and in particular its management system, will require the following supplementary functions in order to cope with the rapid development of Honiara Town.

- 1) Formulate a management and operation system of the market
 - a. Unify management and operations of the central and satellite markets and establish joint supplementary functions.
 - b. Improve the satellite markets
 - c. Introduce a marketing system for produce and fishery products.
- 2) Improve functions in management and operations (equipment, survey on market space as proposed in this project)
 - a. Introduce handling functions based on statistics.
 - b. Introduce functional support equipment
 - c. Introduce a system of information exchange and transmission

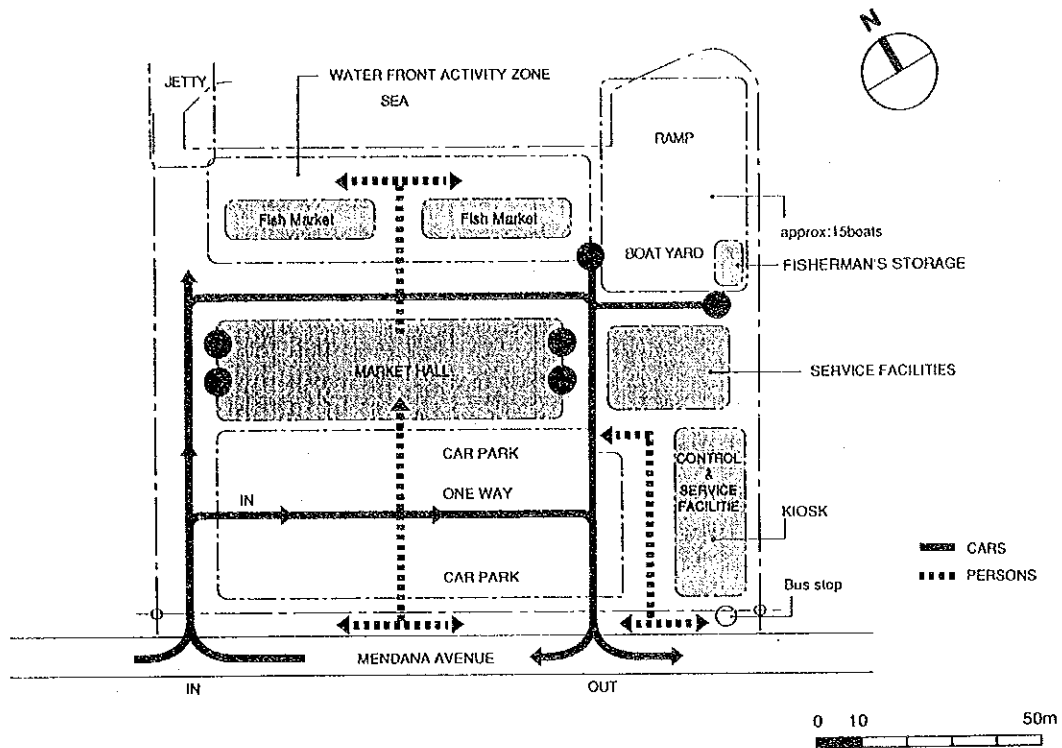


Fig. IV.3.1.3 Zoning and Route Plan of Honiara Central Market

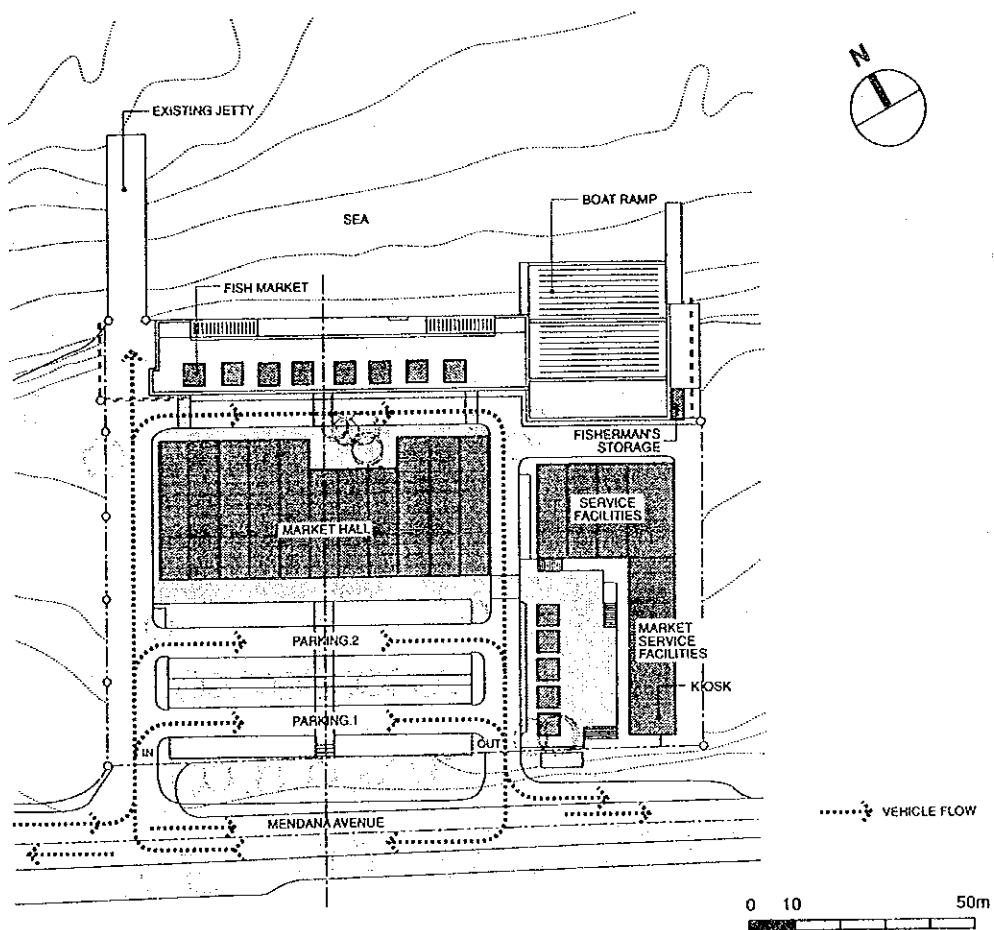


Fig. IV.3.1.4 Layout Plan of Honiara Central Market

Table IV.3.1.1 Planned Capacity of Honiara Central Market in 2000 (1/2)

	Present- 1993	Plan - 2000	Remarks
(1) Market Hall			
1) Handling volume of foliage, fruits, etc.	Peak (Sat.) 82 MT/day Normal 21 MT/day Average 42 MT/day	Peak (Sat.) 110 MT/day Normal 28 MT/day Average 56 MT/day	The peak demand will be met by satellite markets in 2000
Retailers	Peak (Sat.) 480 per/day Normal 200 per/day Average 300 per/day	Peak (Sat.) 500 per/day Normal 270 per/day Average 400 per/day	The number of roofed stalls will be increased from 120 to 350. The road on the north side will be closed off during peak hours and 150 stalls will be set up under a tented area
Sales area & walkway	Markedly congested	Organized zoning	Surplus demand will be met by a marketing network which utilizes satellite markets.
Walkways	Overall low usage	Organized access ways	
2) Handling volume of fish products	Fresh fish 299 MT/year Frozen fish 507 MT/year	Fresh fish 414 MT/year Frozen fish 705 MT/year	The year 2000 will be the first target year. Facilities will be able to cope with market demands by 2010.
	<u>Peak</u> Fresh fish 3.2 MT/day Frozen fish 4.0 MT/day	<u>Peak</u> Fresh fish 4.3 MT/day Frozen fish 5.4 MT/day	A maximum of 64 eskies can be accommodated under the roofed stalls.
	<u>Average</u> Fresh fish 0.9 MT/day Frozen fish 1.6 MT/day	<u>Average</u> Fresh fish 1.3 MT/day Frozen fish 2.2 MT/day	20-ton capacity refrigerator will allow the market to cope with inflow volume during peak hours.
	<u>No. of eskies (Average)</u> Fresh fish 10 eskies Frozen fish 20 eskies (30 eskies in total)	<u>No. of eskies (Average)</u> Fresh fish 13 eskies Frozen fish 28 eskies (41 eskies in total)	Ice making facility will be installed (1.0 ton) to meet the demand for ice and future improvements in marketing methods.
			An improved fish marketing system will be gradually implemented by setting up a fresh fish marketing organization.

Table IV.3.1.1 Planned Capacity of Honiara Central Market in 2000 (2/2)

	Present- 1993		Plan - 2000		Remarks
(2) Fish landing Facilities	Peak Ave.	16 boat (FRP)/day 9 boat (FRP)/day	Peak Ave. Transport boat	20 boat (FRP)/day 11 boat (FRP)/day 1 boat/day	Fish landing facilities (wharf, slipway) will be constructed under Japanese government grant aid. Transport mode will change due to development of model zones 1 & 2.
(3) Fresh fish transport vessel				Carrying capacity 20 eskies	
(4) Service Facilities					
1) Car park		Optimum no.: 60 vehicles Congestion at the main gate and Mendana Avenue as the vans, pick-up trucks, taxis and cars use the main gate as entrance and exit.		Planned parking area for 100 vehicles. Separate entrance and exit ways for vehicles are also planned.	Presently, 350 vehicles are estimated to be at the market during peak hours but traffic congestion will be alleviated due to measures which will be taken. Bus stop will be installed and incoming and outgoing traffic will be separated.
2) Rest area		Rest area is currently being used as sales area		Rest area will be allocated along the beach area.	
3) Stalls/stores		There are stalls for ice cream, fish & chips and fast food, and 8 stores for daily sundry goods		Area for about the same number of stall and stores will be allocated.	The market is located in a commercial zone and stores which reflect market characteristics will be introduced.
4) Management & operation		About 6 m ² space is being used for market master		Sufficient space will be allocated of efficient operation and management.	A market system which includes satellite markets will be the focal point of improvements.
5) Toilet		Rest rooms for men and women are available		Rest rooms to accommodate two times the present will be planned.	
6) Waste/garbage	Peak Average	18 m ³ /day 10 m ³ /day	Peak Average	23 m ³ /day 13 m ³ /day	
7) Others		Sanitary facilities		Lighting and water treatment facilities	

Table IV.3.1.2 Floor Area, Structure of Functional Facilities at Honiara Central Market

Functional Facilities	Number of Storey	Total Floor Area (sq.m)	Foundation	Structure	Additional Facilities & Function
1. Market Hall	1	2000	Spread R.C	Steel	Selling Table, Bench, Discharging Ditch, Sorting Area (No Wall Facilities)
2. Fish Market	1	250	Spread R.C	Steel	(No Wall Facilities)
3. Service Facilities - A	2	900	Spread R.C	Steel	Ice Making Plant, Cold Storage, Fish Sorting Area, Public Toilet, Storage, Waste Dumping Area, etc.
4. Service Facilities - B	2	100	Spread R.C	Steel	Facilities Management Office, Eskies & Commodities Storage Area
5. Market Service Facilities	1 — 2	500	Spread R.C	Steel	Market Master, Information / Meeting Room, Kiosks (Ice Cream, Fast Food, Daily Goods etc.)
6. External Work	Unit	7000	Improvement		Parking, Service Path, Pedestrian Area, Plant Area
7. M&E Work	Unit				Freshwater Supply, Rainwater Discharge, Waste Water Treatment, Seawater Intake
8. Special Facilities	Unit				Wireless Radio, Solar Lighting, Fire Extinguishers, Eskies, Pellet, Hand Lifter, Truck, Transport Boat & Winch

Remarks:

1. Project components not included in the above are:

a Landscaping cost

b Connection to main M & E services (Water, Electricity, Telecommunication, Signage etc.)

c Items which are the responsibility of SIG if project undertaken by Japan's Grant Aid Project

3.2 Model Zone - 2 (Florida Islands)

(1) Development objective

- 1) Establish a stable supply of fishery products to the capital of Honiara, which is the nation's foremost consumption area.
- 2) Increase fishing opportunities and improve fishermen incomes by implementing effective fresh fish collection activities.
- 3) Prevent accidents of fishermen at sea with the introduction of a transport vessel for fresh fish.

(2) Development strategy

- 1) Improvements in facilities and organizational system of the Honiara Central Market will be implemented in conjunction with its renovation schedule.
- 2) Improvements in the current fish marketing system to Honiara will be carried out in stages, and priority will be placed on the autonomy of fishermen and other relevant parties.
- 3) Collection and transport activities will be carried out in stages. The Fisheries Division vessel, Daula, will be used on a trial basis for the time being and a transport ship will be purchased based on the results of this trial activity.

(3) Scope of development

The projected fresh fish transport volume from Florida Islands to Honiara is shown in Fig. IV.3.2.1.

(4) Marketing route

The Florida Islands will be divided into six areas and a satellite (rural fish collection base) will be set up in each area. Satellites will be established in the following areas (see Fig. IV.3.2.2).

Buena Vista Island: Soso
Sandfly Island: Oleuvugha
Big Gela Island (southern area): Tulagi
Big Gela Island (northern area): Vura
Small Gela Island (southern area): Humba and Peula

Fishermen will be responsible for transporting their fish catch to the satellite and the HFMA collection boat will transport the fish from each satellite to the Tulagi base, where it will again be transported to Honiara using transport vessel (Fig.IV.3.2.2).

(5) Facility improvement plan

1) Major facilities

a. Satellite

- Buildings: One storied building containing storage space for eskys, an office, toilet
- Communication facilities: Solar-powered wireless radio (maintain communication between the satellite and base on conditions pertaining to fish landing and collection)
- Rainwater tank: Utilized for washing fish and for drinking water

b. Tulagi base

- Buildings: One storied building containing storage space for eskys, refrigerator to store collected fish prior to shipping, an office, toilet, cargo space
- Communication facilities: Solar-powered wireless radio (maintain communication between the satellite and base).
- Rainwater tank: Emergency water supply
- Electricity and tap water facilities: Indoor and outdoor lighting, electricity supply for refrigerator, cargo space, water supply for washing fish and toilet use
- Jetty: Docking for collection and transport vessels
- Outdoor structure: Outdoor drainage and water supply
- Stone wharf: Wharf will be built on the coast of the present lot.
- Roads: A detour will be built on the existing road.
- Collection vessel: FRP boat (load capacity of 5 to 10 eskys)

2) Scope and specification of major facilities

The scope and specifications of major facilities are given in Table IV.3.2.1.

(6) Organizational system

1) Objective

a. Improve fresh fish transport network.

Stable transport and fish supply to Honiara.

Unify fresh fish transport currently undertaken by individual fishermen and fishermen groups and raise its efficiency.

b. Promote small-scale fisheries

Raise the economic activity and the living standards of the area's inhabitants by fostering fishing skills of inhabitants, improving technology on fish quality preservation, promoting small-scale commercial fisheries, and expanding production volume.

2) Improvements in organizational system

Improvements in the transport network will be implemented according to the following plans.

a. Establish and operate a Tulagi Fish Distribution Center (TFDC).

b. Establish and operate a rural fish collection base.

3) Tulagi base (HFMA branch)

a. Objective

The objective is to implement collection, transport, and marketing activities of fresh fish from the Florida Islands to Honiara.

b. Construction, management, and operations of center

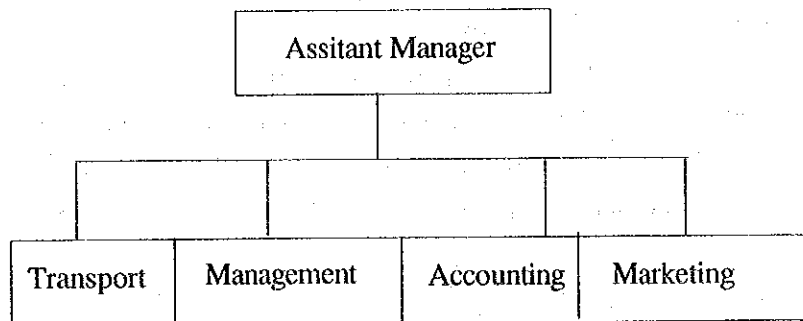
- The center will be built and owned by the HFMA.
- The center will be managed and operated by the HFMA.

c. Role and function of Center

- The Center will implement transport, collection and marketing activities of fresh fish from the Florida Islands.
- The center will manage and operate the rural fish collection bases.

d. Organization/personnel

The center will be divided into the following divisions with the given number of personnel shown below. Major positions will be filled by personnel sent from the provincial fisheries centers. The organizational plan of model zones 1 and 2 is shown in Fig.IV.3.2.3.



e. Fresh fish transport and marketing activities

Transport and marketing activities of fresh fish from TFDC will be implemented in stages. During its initial stages, the center will purchase fish brought in by fishermen and transport it to Honiara. When appropriate facilities (rural fish collection base) and equipment (large FRP collection vessel) have been secured, collection and purchasing activities of fresh fish from each island will begin.

4) Rural fish collection base (RFCB)

a. Objective

The RFCB will be established with the objective of ensuring smooth transport and marketing of fresh fish from each island.

b. Fish collection method


- Fish will be sorted, weighed, purchased in cash, and transported from the collection base.
- Fishermen of each village who want to sell fresh fish must bring their fish to the collection site. With the introduction of collection/transport vessels, this system will be gradually implemented.
- The collection vessels will be large FRP fishing boats.
- Collection period: Fish will be collected from each base once every two days.

c. Construction of collection bases, management/operations

- The facility will be built, managed, and operated by the branch of HFMA.
- Maintenance of the facility will be entrusted to the villages in the area (fishermen groups).

(7) Layout plan

A simple design of major facilities are given in Fig. IV.3.2.4, IV. 3.2.5, and IV.3.2.6.

FLORIDA ISLANDS					
Fresh fish (mt)	Big Gela	Sandfly	Buena Vista	Small Gela	Total
1995	64	103	23	26	216
2000	74	119	27	30	250
2010	140	222	52	56	470
<div style="text-align: center;">  </div>					
HONIARA MARKET					

Remarks: Quantity expressed in whole weight equivalent.

Fig. IV.3.2.1 Origin/Destination of Fresh Fish of Florida Islands (1995, 2000, & 2010)

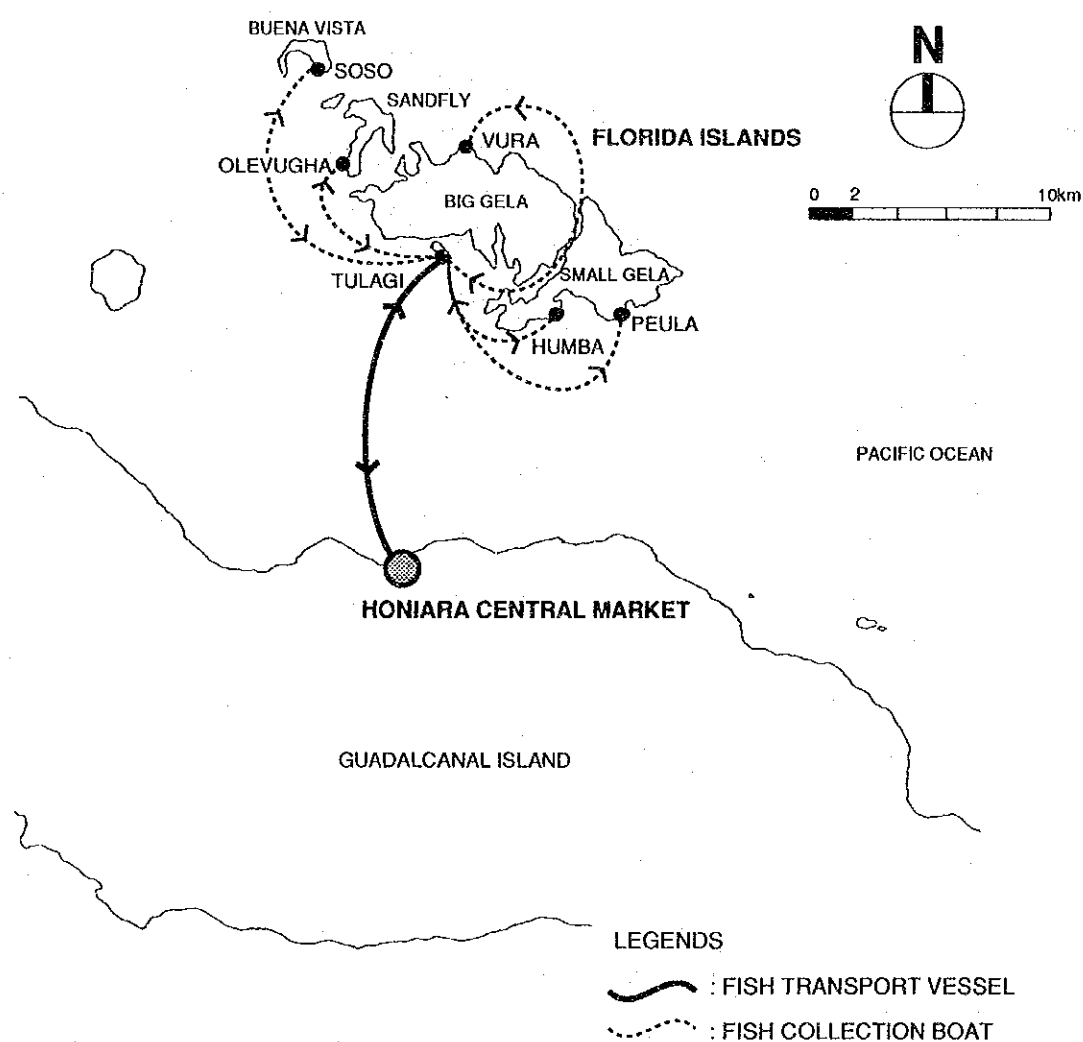
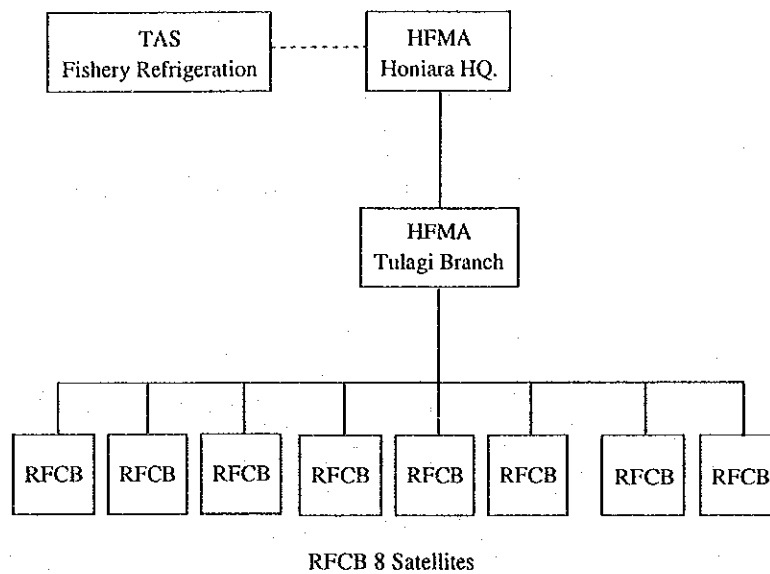


Fig. IV.3.2.2 Fish Transportation Route Plan in Model Zone 2 (Florida Islands)

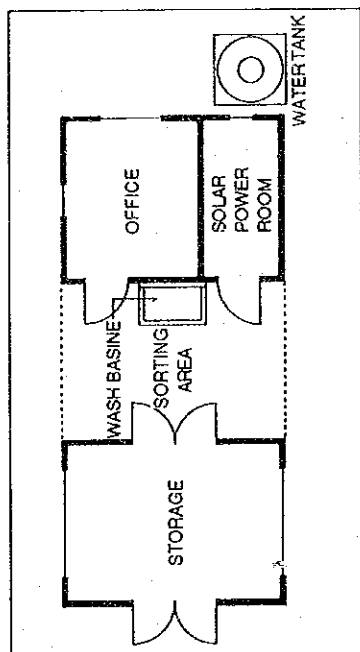


Remarks : HFMA; Honiara Fish Marketing Authority

RFCB ; Rural Fish Collecting Base

TAS ; Technical Assistance Staff (Volunteer) dispatched from Fisheries Division.

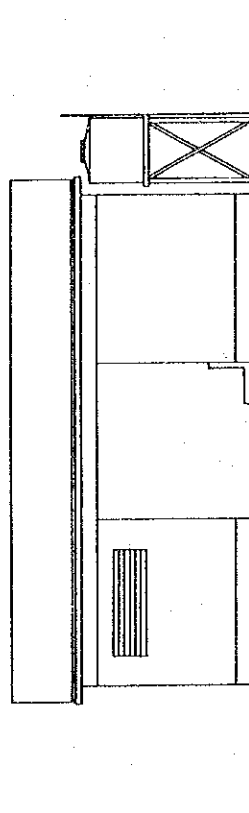
Fig. IV.3.2.3. Organization Plan of Model Zones 1 & 2



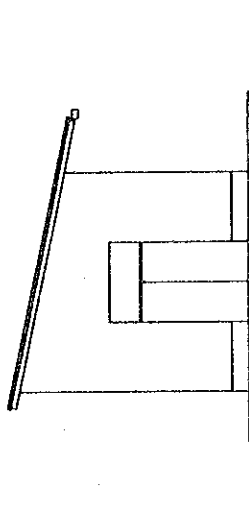
PLAN

OUT LINE OF FACILITIES

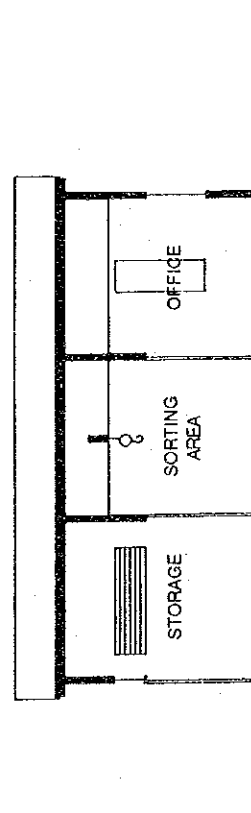
- * Buildings
 - Wooden Truss
 - RC Frame & Brick Wall
 - RC Floor
 - RC Spread Foundation
- * E & M
 - Water Tank
 - Solar Power Lighting & Radio
 - Utility & Drainage



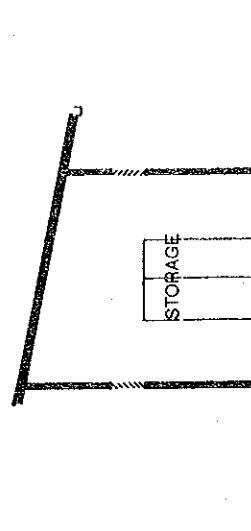
ELEVATION 1



ELEVATION 2



SECTION 1



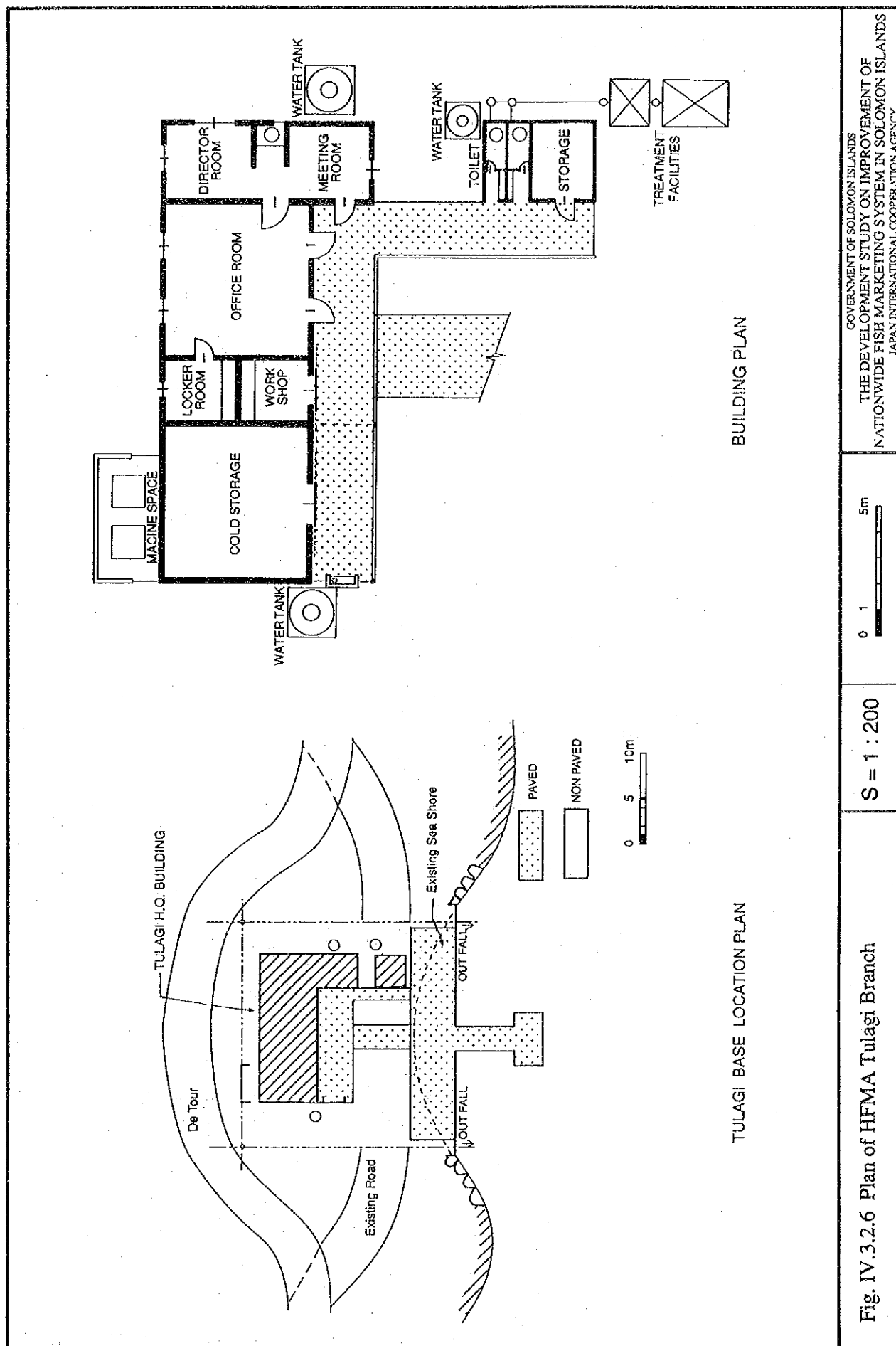
SECTION 2

Fig. IV.3.2.4 Satellite Fishery Service Center, Type A

S = 1 : 150



GOVERNMENT OF SOLOMON ISLANDS
THE DEVELOPMENT STUDY ON IMPROVEMENT OF
NATIONWIDE FISH MARKETING SYSTEM IN SOLOMON ISLANDS
JAPAN INTERNATIONAL COOPERATION AGENCY



GOVERNMENT OF SOLOMON ISLANDS
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JAPAN INTERNATIONAL COOPERATION AGENCY

S = 1 : 200

Fig. IV.3.2.6 Plan of HFMA Tulagi Branch

Table IV.3.2.1 Outline of Major Facilities in Zone 2

Item	Component	Detail
TULAGHI BASE		
1. Building (1 no.)	1 storey, 180 sq.m, Spread R.C. foundation, R.C. frame, brickwall, wood truss	Fish handling area, workshop, power-station, office, cold storage, market, utility, toilet
2. Shore work/jetty	Shore protection work with revetment and construction of armour stone jetty	3 m wide approach embankment with 4 x 6 m concrete unloading point complete with fenders & solar beacon light
3. Cold/Ice storage (1 no.)	Prefabricated cold/ice storage (-2° C) of capacity of 90 sq.m	7.5 KW refrigerating machine with storage capacity of 20 eskies
4. Truck crane (1 no.)	Capacity 2 ton	
5. Hand lifter (2 no.)	Capacity 700 kg	
6. Communication Equipment (1 no.)	Solar powered wireless radio	
7. Carrier boat - Hull (3 no.)	FRP boat with carrying capacity of 5 to 10 eskies.	
8. Carrier boat - Engine (6 no.)	Each carrier boat to have 2 engines	Engine 25 HP
9. Water tank (2000 gal) (1 no.)	FRP	
10. Esky (20 no.)	FRP	
SATELLITES		
11. Buildings (6 no.)	1 storey building, Spread R.C. foundation, R.C. frame, brickwall, wood truss	Fish handling area, esky storage space, office and storage
12. Ice storage (6 no.)	Prefabricated type	Capacity 6 eskies
13. Communication Equipment (6 no.)	Solar powered wireless radio	
14. Water tank (600 gal) (6 no.)	FRP	
15. Esky (40 no.)	FRP	Internal dimension 4' x 2' x 2' (200 Kg capacity)

3.3 Model Zone - 3 (Western Province)

Model Zone - 3 encompasses the wide area of Western Province. This zone was further divided into the three sub-zones 1 (Gizo area), 2 (Munda/Noro areas), and 3 (Seghe area), in view of the region's different fishery resources, fish marketing conditions, infrastructural development, and the society and lifestyles of its inhabitants.

(1) Development objectives

- 1) Effectively utilize existing fish marketing facilities (Fisheries Center, STL, Kuarao) to increase fish landing volume and improve fish quality.
- 2) Supply fresh fish to areas where there is a shortage (Munda/Noro areas).
- 3) Improve fishermen income in keeping with increased production.
- 4) Promote fish export in conjunction with increased production and improved fish quality.

(2) Development strategy

- 1) Sub-zones 1 and 2 are closely interrelated in terms of fish marketing. Therefore, these two Sub-zones will be incorporated under one marketing system.
- 2) Fresh fish collection and transport activities will be implemented in gradual stages. During the initial stages, the provincial government vessel, the Kuarao, will transport the fish. Based on the results of its operations, a new collection/transport vessel will be purchased, in view of Kuarao's age and depreciation.

(3) Scope of development

It is estimated that the supply volume of Sub-zone 2 rather than Sub-zone 1 will reach 48 mt in 1995, 87 mt in 2000, and 165 mt in 2010. The origin/destination volume of fresh fish in Sub-zones 1 and 2 for each year is shown in Figs. IV.3.3.1 and IV.3.3.2.

(4) Marketing route

As shown in Fig. IV.3.3.3, six satellites (rural fish collection base, RFCB) will be established in Sub-zone 1.

- Vella Lavella Island: Surato, Vatro, Moro, Lambulambu
- Ranongga Island: Nburi
- Vona Vona Island: Rarumana

The headquarters of the distribution/transport system will be located in Noro and a branch office will be established in Gizo. The transport route will be divided into two groups, as explained below.

- 1) Route 1: 2 bases on the western coast of Vella Lavella Island, 1 base on Ranongga Island, for a total of 3 bases.
- 2) Route 2: 2 bases on the eastern coast of Vella Lavella Island, 1 base on Vona Vona Island, for a total of 3 bases.

The collection/transport routes are shown in Fig.IV. 3.3.3.

Collection and transport activities by the ship Kuarao and its new replacement after its depreciation are given below.

During the initial and interim stages of the Project:

- Collection and transport ship - Kuarao
- Frequency of collection - Once every two weeks

During the latter stages of the Project:

- New collection and transport ship - 2 ships
- Frequency collection: Once a week

(5) Facility improvements

1) Major facilities

a. Satellite

- Building: One storied building, fish disposal area, esky storage area, office, warehouse
- Communication facilities: Solar powered wireless radio (to communicate fish landing and collection conditions between satellite and base)
- Rainwater tank: Water to wash fish and other utility uses

b. Noro base

- Building: One storied building, fish disposal area, esky storage area, refrigerator for collected fish, office, toilet
- Communication facilities: Solar powered wireless radio (to communicate fish landing and collection conditions between satellite and base)
- Rainwater tank: Emergency water supply
- Electricity, tap water facilities: Interior and exterior lights, generator to power refrigerator, fish disposal area, tap water facility for washing fish and toilet use
- Jetty: Docking for collection/transport vessel (utilize existing facility)
- Outdoor structure: Outdoor drainage and water supply

- c. Gizo branch office
 - The existing Fisheries Center will be used.
- d. Collection/transport vessel
 - Initial and interim stages of project: Kuarao
 - Latter stages of project: FRP boat 4.5GT x 2
- 2) Scope and specifications of major facilities
 - The scope and specifications of major facilities are shown in Table IV.3.3.1.
- (6) Organization system
 - 1) Objectives of improved organization/system
 - a. Establish an organized system to transport and provide a stable supply of fresh fish in the Noro and Munda districts.
 - b. Establish an organized system capable of becoming a supplementary source of fresh fish supply to Honiara.
 - c. Establish an organization/system capable of improving the network for high-priced export fish.
 - 2) Areas targeted for improved transport/marketing network
 - a. Sub-zone 1: Gizo District (Gizo, Ranonga, Vella Lavella, Vona Vona islands)
 - Collect and transport fish from the Sub-zone for marketing in the Noro/Munda districts and market fresh fish to the Gizo Fishery Center.
 - b. Sub-zone 2: Munda/Noro districts
 - A fresh fish transport and marketing center will be set up in Noro to implement marketing activities. Fresh fish marketing activities will also be carried out at the Munda Fishery Sub center.
 - c. Sub-zone 3: Seghe District
 - A system to transport fresh fish from this area to Honiara will be established.
 - 3) Improvements in organization/system
 - Improvements will be implemented according to the following plans. The organizational plan is shown in Fig. IV.3.3.4.
 - a. Establish the Western Province Fish Distribution Authority (WPFMA).
 - b. Establish and operate a fresh fish collection base.

4) WPFMA

a. Basic design

The objective is to promote the overall development of fisheries in Western Province. A segment of the functions carried out by the provincial fisheries division will be transferred to this public corporation which will be responsible for improving the fresh fish transport network and to carry out transport/marketing activities within the province.

In future, activities such as fish processing and the development of private fishing companies (mainly joint ventures between foreign and domestic firms) will be planned and implemented in order to promote fisheries within the province.

b. Organizational structure

- The nature of the organization, its structure and functions will be regulated by the ordinances of Western Province.
- Its financial structure will be separate from provincial finances.
- It will be a public corporation funded jointly by the provincial government and existing public corporations (DBSI, CEMA, SIEA).
- In future private investment funds will be accepted and the organization will eventually be transferred to the private sector.

c. Planned activities

- Set up a fresh fish marketing area in Noro, establish branch offices in Gizo, Munda, and Seghe.
- Implement fresh fish transport, collection, and marketing activities within the province.
- Market fishing materials and ice.
- Fish processing activities.

d. Management

- Board of Directors

The operational strategy of the WPFMA will be carried out by the Board of Directors.

- Management

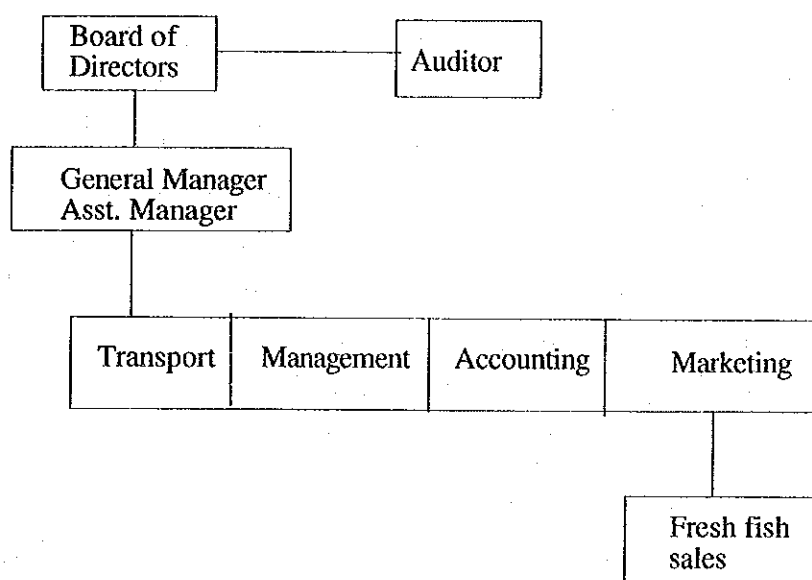
Actual management and operations will be implemented by the general and assistant managers.

- Audit

Accounts will be audited by several auditors.

- Operations

An accounting, transport, fresh fish transport sections will be established and operations will be carried out qualified personnel. During the organization's initial operations, staff members will be sent from the Fisheries Division, the provincial Fisheries Division, etc. to supplement the shortage of personnel. The overall organizational plan is shown in Fig. IV.3.3.4.



e. WPFMA support facilities

- Branch offices

Branch offices will be established in Gizo and Munda and the facilities of the provincial Fishery Center and Sub center will be utilized for its operations.

- Management and operations

The management and operations of the branch offices will be carried out by WPFMA.

- Principal divisions/personnel

Qualified personnel will be recruited by the center, in addition to staff members dispatched from the provincial Fisheries Division.

- Gizo branch office: Manager (one person), fresh fish marketing section (two persons)
- Munda branch office: Manager (one person), fresh fish marketing section (one person)

f. Fresh fish marketing activity

- Fresh fish will be marketed to Noro, Gizo, and Munda.
- In addition to retail activities for the general consumer, wholesale activities will be implemented targeting processors, exporters, and other large volume customers.

g. Sub-zone 1 (Gizo)

- Improved system in Gizo District

A branch office of the WPFMA will be set up in the Gizo Fishery Center. Rural fish collection bases will be established throughout the islands in the Gizo District and the branch office will manage these bases. The collected fish will be transported to the Noro center.

- Rural fish collection bases

The collection bases will be established to ensure efficient collection, transport, and marketing activities of fresh fish produced in the Gizo District. The islands in the Gizo District was divided into four geographical areas for a total of eight collection bases.

- Fresh fish collection activity

The WPFMA collection vessel will collect the fish at the collection bases. The collection bases will be responsible for weighing and sorting the fish before the vessel's arrival. All fish will be purchased at the collection point and village fishermen are responsible for transporting their fish there.

- Facilities at the rural collection base

Fresh fish unloading area, esky storage room, eskies, wireless radio, office

- Management of the rural collection base

- The WPFMA will be responsible for the management of the collection base.
- Its maintenance and operations will be carried out by the villages in the area. Two village inhabitants will be employed to maintain the facility, weigh the fish, carry out the office work, etc.

h. Sub-zone 2 (Munda/Noro)

A marketing place will be established at the Noro center and fresh fish collection and purchasing activities will be carried out at the Munda Fishery Sub center. A regional marketing network for the area's inhabitants will be set

up by combining and utilizing the fish collected in the Munda District and transported to Noro.

i. Sub-zone 3 (Seghe)

- Improved marketing system in Seghe District

Seghe has been selected as a candidate site for the second EC project to foster small-scale commercial fisheries in rural areas in 1994. Subsequently, this area will be the recipient of cooperation and assistance in the near future. However, it will eventually be placed under the jurisdiction of the WPFMA.

- Improvements in organization/system

Improvements in organization/system will not be implemented for the time being. Such improvements will be carried out after small-scale commercial fisheries in the Seghe District have been fostered. Meanwhile, the Seghe Fishery Center will be utilized to collect fish from the villages and transported to Honiara.

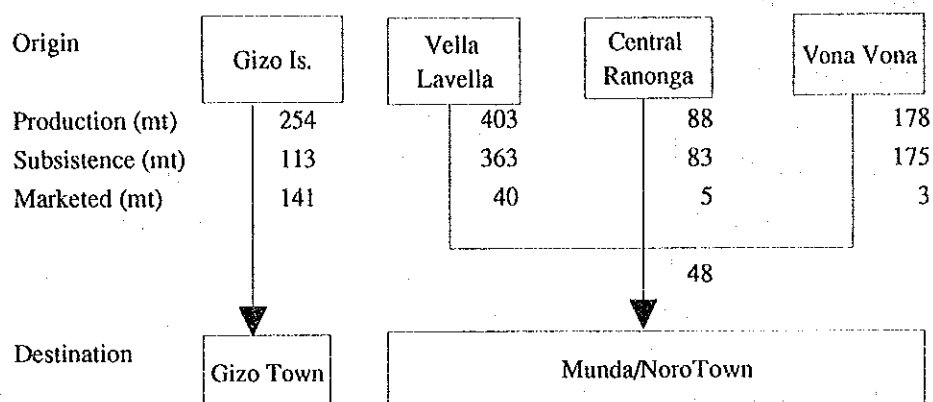
- Management and operations

The provincial fishery division will be responsible for the management and operations of the Seghe Fishery Center.

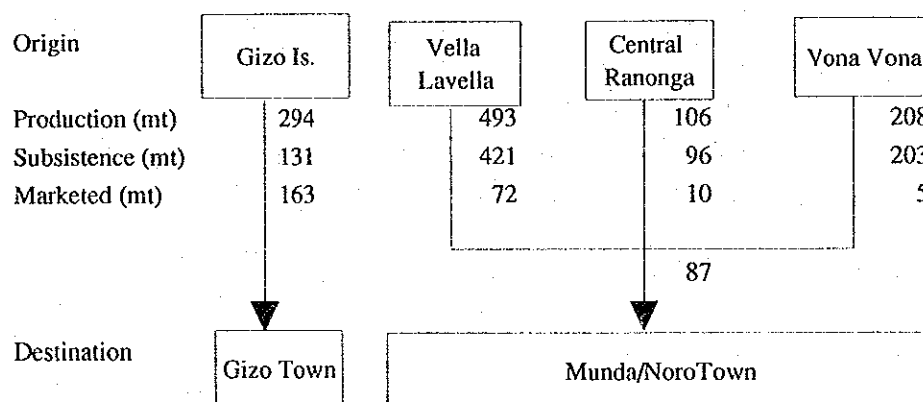
(7) Layout plan

The layout plans are shown in Figs. IV.3.3.5 and IV.3.3.6.

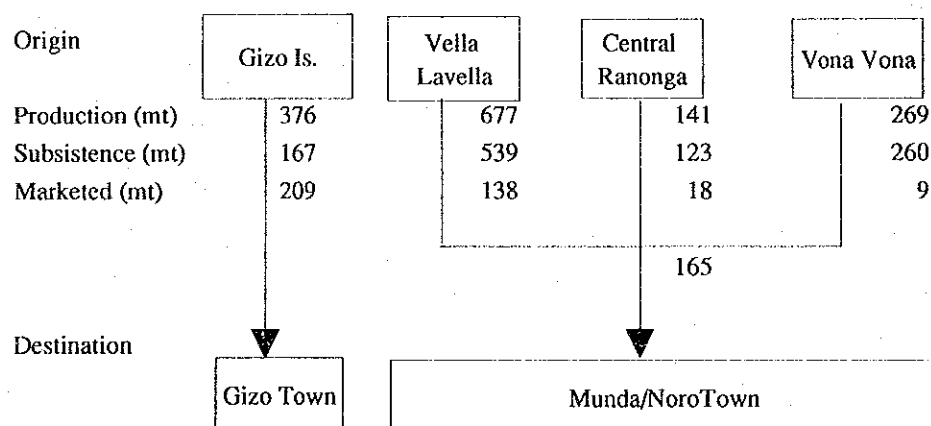
(1) 1995



(2) 2000



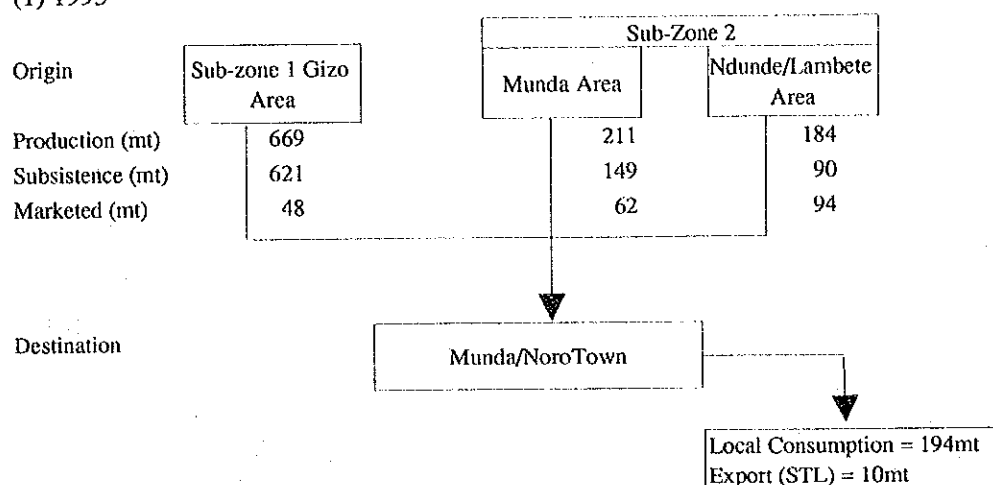
(3) 2010



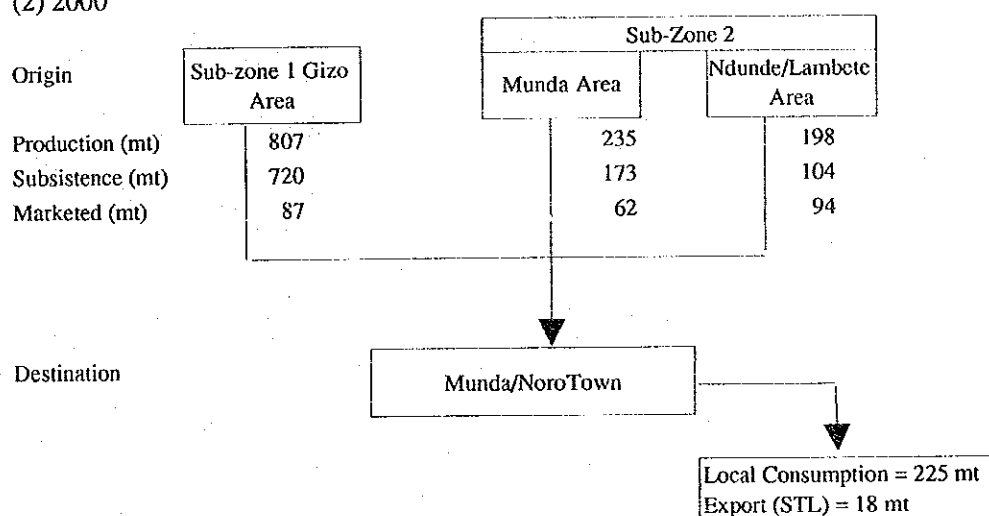
Remarks: Quantity expressed in whole weight equivalent.

Fig. IV.3.3.1 Origin/Destination of Marketed Fresh Fish in Gizo Is., Vella Lavella Ranonga & Vona Vona (1995, 2000 & 2010)

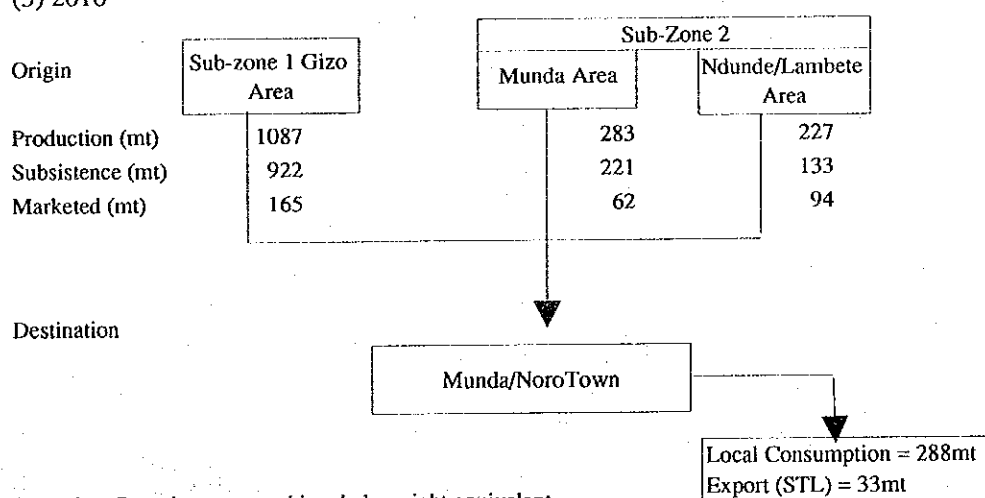
(1) 1995



(2) 2000



(3) 2010



Remarks: Quantity expressed in whole weight equivalent.

Fig. IV.3.3.2 Origin/Destination of Marketed Fresh Fish in Munda/Noro Area (1995, 2000 & 2010)

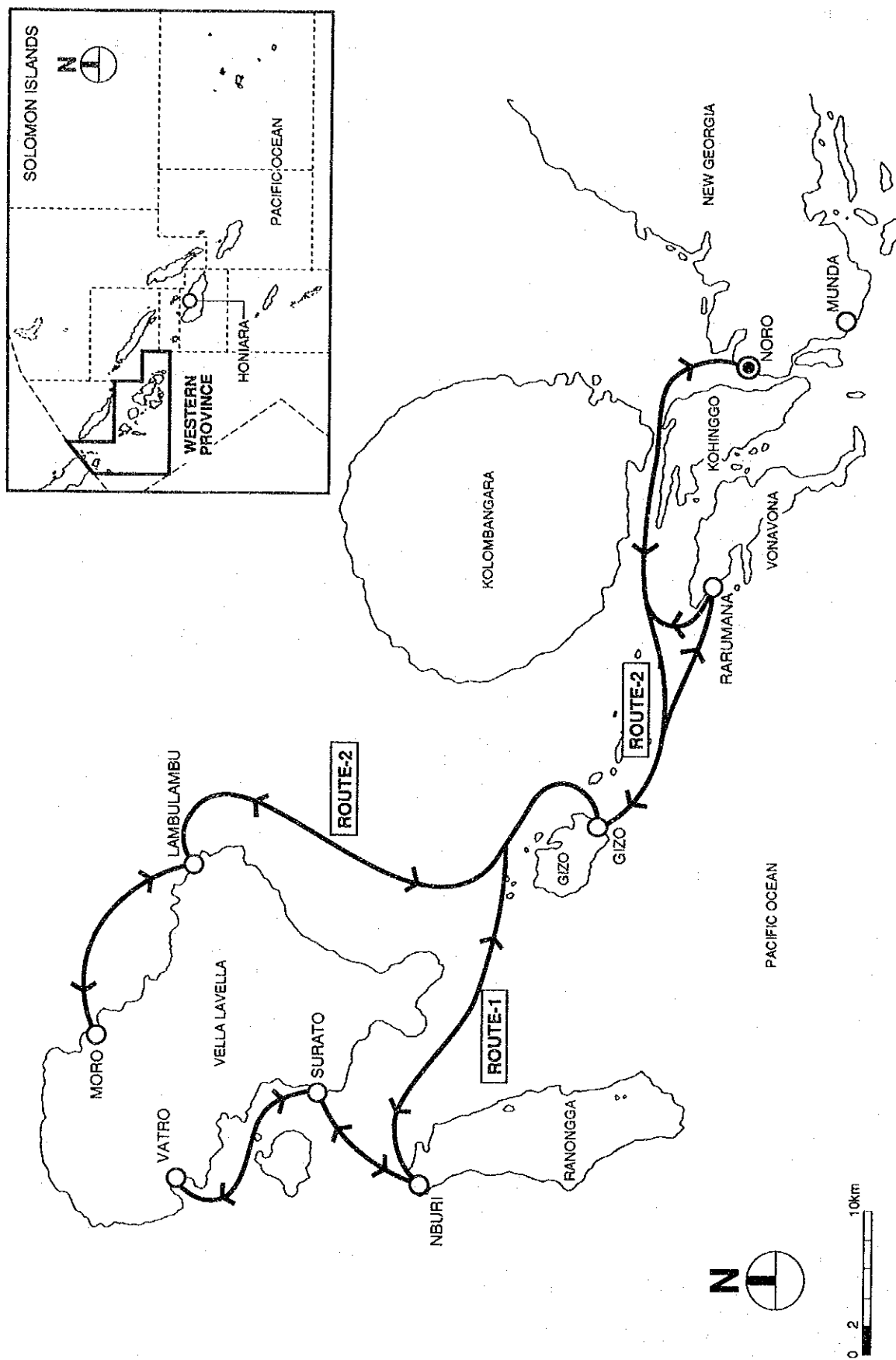
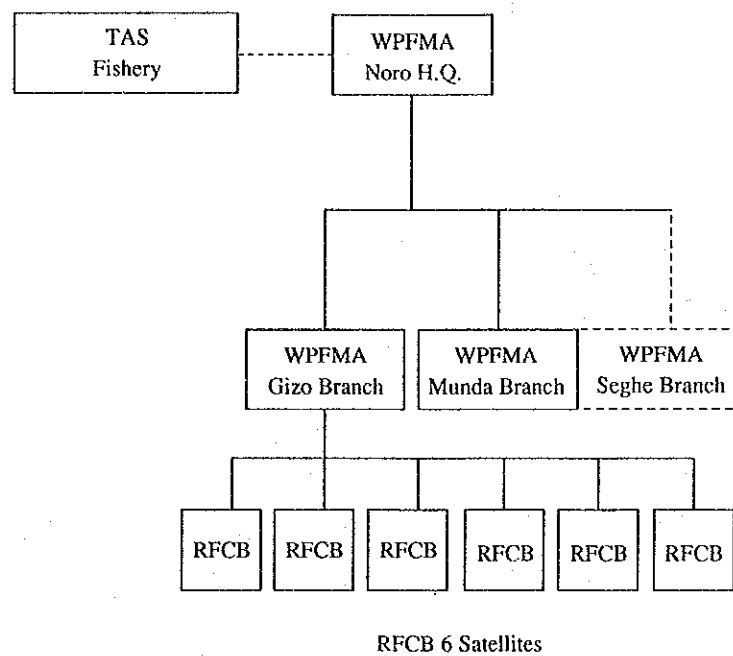
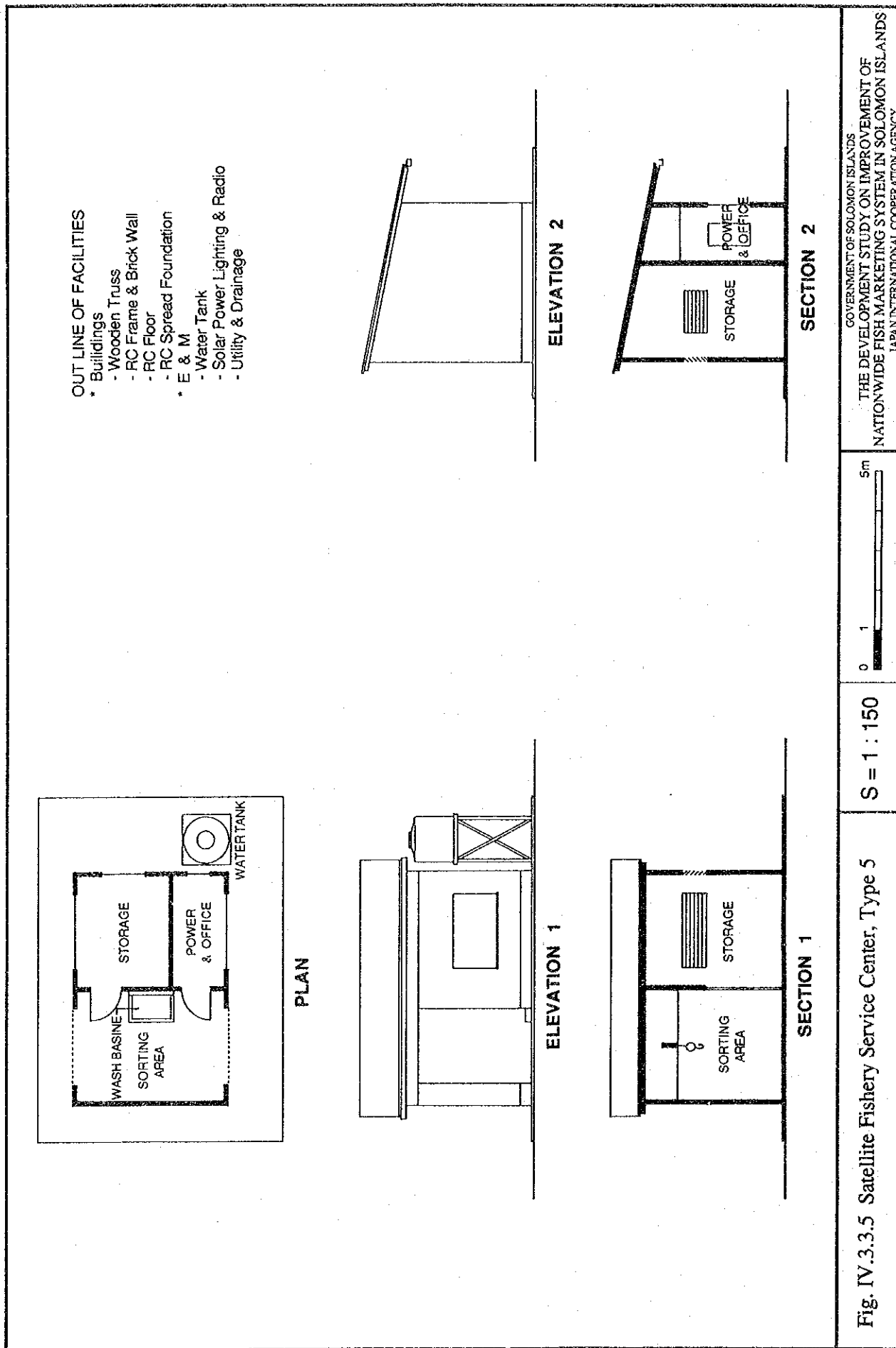


Fig. IV.3.3.3 Fish Collection and Transportation Route Plan in Sub-Zones 1 & 2 of Model Zone 3



Remarks : WPFMA ; Western Province Fish Marketing Authority
 RFCB ; Rural Fish Collecting Base
 TAS ; Technical Assistance Staff (Volunteer) dispatched from F.D.

Fig. IV.3.3.4 Organization Plan of Model Zone 3



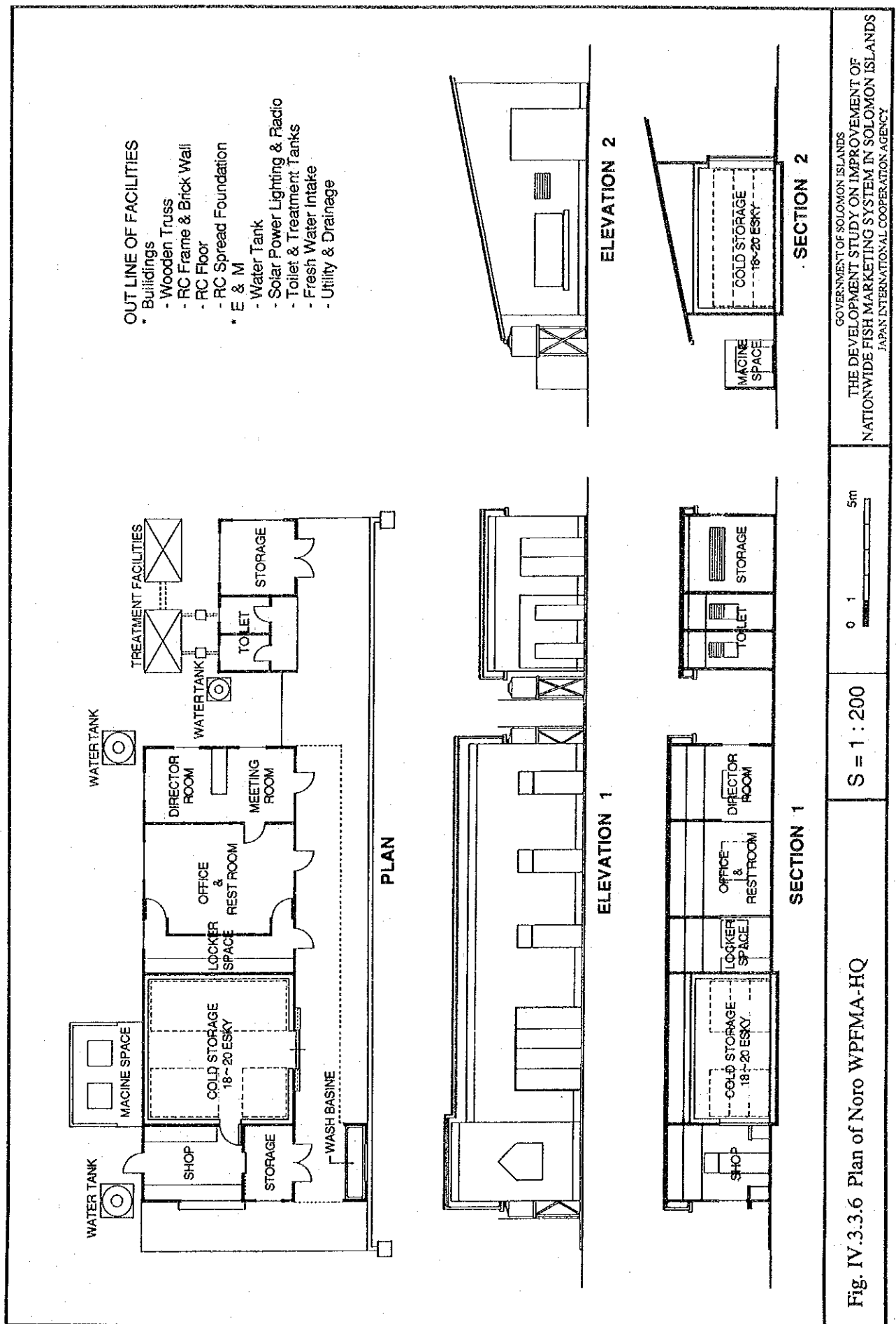


Fig. IV.3.3.6 Plan of Noro WPFMA-HQ

Table IV.3.3.1 Outline of Major Facilities in Model Zone 3

Item	Component	Detail
NORO H.Q		
1. Building (1 no.)	1 storey, 126 sq.m, Spread R.C. foundation, R.C. frame, brickwall, wood truss	Fish handling area, workshop, office, cold storage, market, utility, toilet
2. Cold/Ice storage (1 no.)	Prefabricated cold/ice storage (-2° C) of capacity of 90 sq.m	7.5 KW refrigerating machine with storage capacity of 20 eskies
3. Truck crane (1 no.)	Capacity 2 ton	
4. Hand lifter (2 no.)	Capacity 700 kg	
5. Communication Equipment (1 no.)	Solar powered wireless radio & telephone	
6. Transport Vessel (2 no.)	FRP boat with carrying capacity of 5.8 Gross Ton	Engine 42 HP
7. Water tank (2000 gal) (1 no.)	FRP	
8. Esky (150 no.)	FRP	Internal dimension 4' x 2' x 2' (200 Kg capacity)
SATELLITES		
9. Buildings (6 no.)	1 storey building 24 sq. m, Spread R.C. foundation, R.C. frame, brickwall, wood truss	Fish handling area, esky storage space, office and storage
10. Ice storage (6 no.)	Prefabricated type	Capacity 4 eskies
11. Communication Equipment (6 no.)	Solar powered wireless radio	
12. Water tank (600 gal) (6 no.)	FRP	
13. Esky (100 no.)	FRP	Internal dimension 4' x 2' x 2' (200 Kg capacity)

3.4 Model Zone - 4 (Rennell Island)

3.4.1 Development Plan

The objectives of the development plan for Rennell island are given below.

- (1) Raise the social welfare and living standards of the area's inhabitants (remote island promotion and development).
- (2) Foster industries that will respect efforts to preserve the internationally acclaimed natural environment and resources.

3.4.2 Development Strategy

- (1) Improve facilities of the harbor which is a supply point for resources transported to the island by ship. However, carrier boats will be used for the time being.
- (2) Fisheries carried out by existing Fishery Centers will be promoted, a general distribution system including fishery products will be improved, and a model area in remote island development will be promoted.
- (3) In order to meet the inhabitants' basic infrastructural needs in housing, water supply, electricity, schools, public health, medical communication, and traffic, improvements will be made in fish marketing and marketing related functions.
- (4) Countermeasures against natural disasters will be considered in this cyclone prone island.
- (5) Basic social improvements which will not overlap with measures implemented by the existing cyclone restoration plan will be undertaken.
- (6) Due to major restrictions in transport and management of fuel and other resources from outside the island, facilities with nominal maintenance and control requirements will be installed.
- (7) Comprehensive improvements which will ensure sustainable operations will reflect restrictive factors in securing financial and human resources.
- (8) A consensus from the region's inhabitants on development measures will be taken into consideration during the formulation and implementation stage of the island development plan.