

3.4.3 Contents of Development Plan

(1) Cargo loading/unloading facilities at Kanggava Bay

1) Possible site for wharf construction

Lavanggu village is the gateway to Rennell Island and construction of wharves is vital for the province's future development, in conjunction with improvements in its inland transport system. Subsequently, a study was carried out on berth construction.

a. Topography of the coast

The nature of coastline of Kanggava Bay is described in section of Regional Plan 4.1(5). The coral reefs near the stream of fresh water on the west side of the sand beach, are exposed according to observations made during the ebb tide in October 1993. Outrigger canoes pass through a narrow waterway between the coast and these exposed reefs. Open channel has to be considered in the planning of a wharf.

b. Site investigation

According to the 1976 JICA study, the west side of the sand beach where there is very few coral reefs, was selected as the proposed berth site. For a maximum vessel size of 500GRT, a length of 30m, and a draft of 3.0m, the west side of the sand beach was selected as a proposed berth site based on the reasons delineated below.

- The cargo volume unloaded at one time is about 2.0 mt at present and it is very small. However, it is estimated that this volume will not exceed 10 mt in future and subsequently, a large berth will not be required.
- The tip of the coral reef is only 100m away from the coast.
- A jetty and connecting access way can be constructed utilizing the exposed reefs.
- There is room to build a road wide enough to accommodate one trailer tractor running from the sand beach to the berth area.

c. It is necessary to gain a consensus from the inhabitants using the bay as fishing grounds and to carry out a survey on reef and ocean floor conditions and natural conditions during rough weather, prior to selecting a berth site and designing port facilities. A study of the following items are required.

- A detailed study of the general sea conditions of Lavanggu and in particular, during the rough weather season.
 - A detailed study of coral reef conditions is required.
 - A boring survey of the ground is required.

- Study of transport and supply conditions
- When a detailed survey of the construction base is carried out, it is necessary to consider the old cargo yard of the Mitsui base in Lugu Bay as an alternate site. In particular, the Mitsui base is deep and allows large vessels to approach the fringes of the reefs. At present, transport services in heavy equipment utilizes this area. In conjunction with port improvements in Lavanggu, it is recommended that this area is selected as an alternate base when ocean and wind conditions are not favorable at Lavanggu. This will contribute to more comprehensive navigational routes to Rennell Island.

d. The proposed berth site utilizing the exposed coral reefs on the west side of the coast is shown in Fig.IV.3.4.1.

2) Plan of cargo handling facilities

a. Function

- Renovate the cargo yard in keeping with its role as the gateway to Rennell Island.
- Improve the income of inhabitants through expanded trade and market volume of goods flowing between Rennell and the other islands, due to a renovated cargo yard.

b. Location and scope

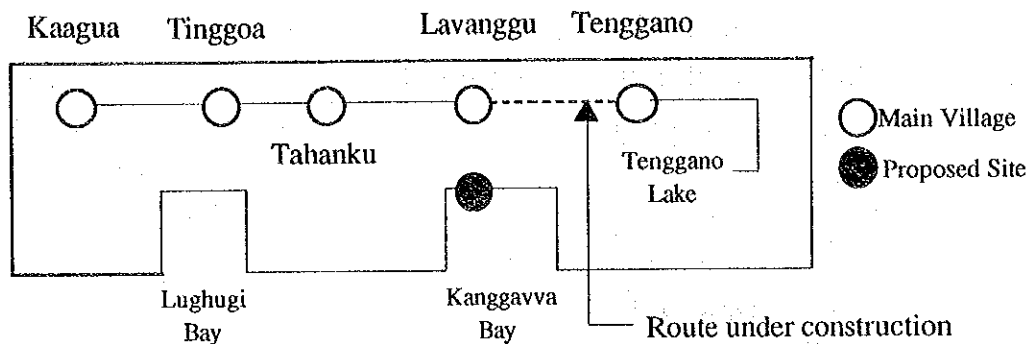
Location :The existing cargo handling area at Kanggava Bay and its surrounding area.

Scope : Determine the cargo content, allow enough space for the trailer tractor to turn around, decide the location of the cargo barge, etc., in order to determine the minimum amount of space required.

c. Route Plan

Kanggava Bay as the ocean gateway to Rennell Island will function as a distribution point, supported by improvements carried out on the existing cargo yard, access way, and installation of supplementary equipment. It is anticipated that the effects of enlarged distribution will be further enhanced by combining these improvements and renovations with the construction of rural social support facilities proposed plan..

An outline of the route plan is shown on the following page.



Location and Route Plan

d. Contents of facilities

- Improve the road leading from the steep hill where Lavanggu inhabitants live, to the beach.
 - Pave the steeply inclined areas.
 - Build road drainage and drainage facilities.
- Improvements to the cargo yard
 - Carry out soil preparation and pave the cargo yard.
 - Construct a small warehouse for stocking cargo.
 - Create sufficient space to allow the trailer tractor to turn around.
- Set up a small barge to land fish on the coast from the fishing boat anchored in offshore waters.
 - Install a small barge with outboard engine.
 - The barge must be capable of transporting uniform sized construction materials, drum cans, etc.
 - Set up land storage space for the barge. (Facility to pull the barge up on land, according to easy guidelines.)
 - Small manual winch, rope, rotating temporary buoy, etc.
- Installation of emergency lights
 - Install small, solar powered light facilities, in order to cope with emergency night departures and arrivals.

(2) Improvements related to fisheries development

1) Function

- a. Accelerate inland distribution of fish by improving the functions of the Fisheries Center. Minimization of operational staff will be considered

- b. Improve the income of inhabitants by expanding fishing opportunities and by developing reef fisheries.

2) Location and scope

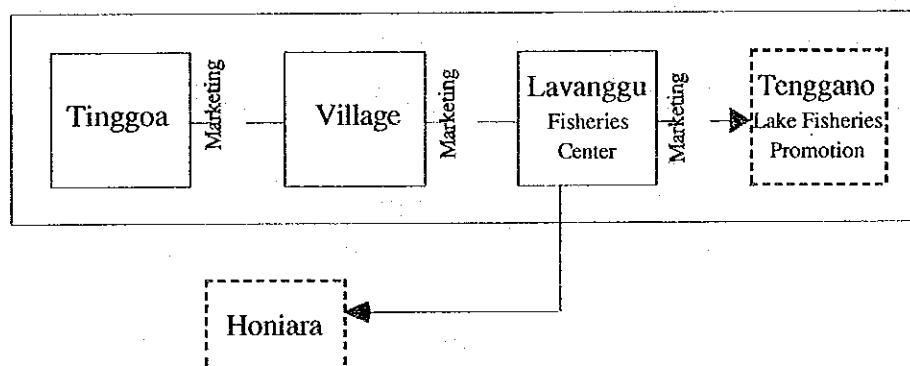
Location: Existing Lavanggu Fisheries Center and Kanggava Bay.

Scope: Fisheries training equipment, fresh water supply, etc., as initial step of improvement measures will be limited to fisheries. Promoting fisheries in Lake Tengano will require a survey on fishery resources and development measures should be implemented in gradual stages. Further development measures should be considered after the road to Lake Tengano is opened and a plan on regional social support facilities is decided.

3) Route plan

Improvements and renovations set forth in this plan will be limited to the Lavanggu area.

Further development of this area should be considered after the Lavanggu - Lake Tengano road has been opened and a plan on regional social support facilities has been decided. An outline of the present plan is shown below



Fish Marketing within Island

4) Contents of facilities

- a. Expand the functions of the existing Fisheries Center: Fresh water will be supplied from a water source located 150m west of the Fisheries Center, to the center and the cargo yard of Kanggava Bay. A small, direct flow, solar powered pump or a pressure difference pump will be used.

- Small, solar powered system
- Water intake works and pipe installation
- Direct flow pump or pressure difference pump

- b. Fisheries training program: The Fisheries Center is planning to carry out training programs for fishermen to improve current fishing methods.

Appropriate equipment will be supplied to improve fisheries in Lavanggu and to protect fishery resources.

- Training equipment (fishing gear)
- Easy-to-use resource survey equipment (rubber boats, etc.)
- FRP canoes

The content of the proposed improvement measures is shown in Table IV.3.4.1.

(3) Establish social assistance center

A development plan for social assistance center focusing on the areas of Tinggoa and Lavanggu was formulated. Subsequently, a plan to establish a multi-purpose community support center and a plan to improve the public transport system were formulated.

1) Function

- a. Improve basic regional support functions and provide comprehensive emergency support functions by installing multi-purpose regional facilities which will be capable of withstanding damages incurred by cyclones.
- b. Achieve expanded distribution within the island, information exchange functions, and trade functions through improvements of the distribution center.
- c. Achieve expanded distribution of fishery products, etc. and provide opportunities for new industries such as tourism by renovating public transportation and accelerating travel within the island.

2) Location and scope

- a. Plan to establish a multi-purpose community support center

Location: A total of four centers will be set up in Tinbua and Tahunuku, Tenggano, and Lavanggu in western, eastern and central Rennell Island, respectively. All centers will be located along the major inland road. All villages will be covered in a 10km radius.

Scope: The structure of the centers will be 6.0m x 27.0m. Structural specifications of the facility will withstand the force of a cyclone. The Sub-center will be 6.0m x 12.0m and both facility and equipment will be easy to maintain.

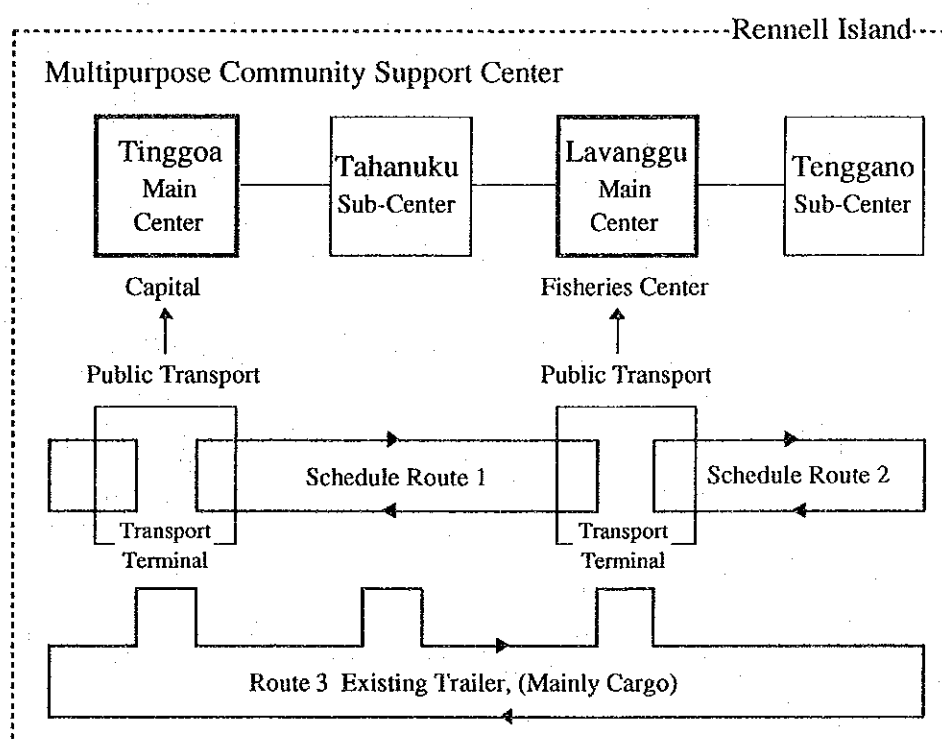
b. Plan to improve the public transport system

Location: Improvements in public transport are planned in two locations, the western area of Rennell and in Lavanggu along the coast.

Scope: Install two one cycle trailer tractors for use between Tinggoa and Lavanggu.

3) Route plan

Development plans on multi-purpose social support centers and public transport. Tinggoa and Lavanggu will be designated distribution centers and Tahanuku and Tengano will be designated as Sub-Centers.



4) Contents of facilities

Plan to improve the public transport system and plan to establish a multi-purpose regional social assistance center.

The Lavanggu and Tinggoa facilities will be the focal centers and Tahanuku and Tengano will function as sub-centers.

Planned facilities are shown in Fig.IV.3.4.2 and Fig. IV.3.4.3.

- a. Plan to establish a multi-purpose regional social assistance center
 - Functions of a marketing center: The markets will be improved to allow agricultural and fish products and daily commodities to be stocked under sanitary conditions. The marketplace will also function as a multi-purpose area for the region's inhabitants.
 - Function as a transportation station: A waiting area will be set up in one area of the marketplace which will also function as a transport station for the trailer truck.
 - Repair base functions: A workshop equipped with easy-to-use repair equipment and spare parts will be set up to enable long term use of equipment on the island.
 - Economical energy consumption:
 - Compact lighting
 - Communication facility (to be installed only at the base center).
 - hand pump system
 - Assistance role of the center: Of the four proposed centers, a 4WD double cab pickup will be provided at the Tinggoa and Lavanggu centers to be used by the provincial government in times of emergency. In addition, several bicycles will also be provided.
 - Sanitary facilities: Separate toilets and washrooms will be renovated. Due to the karstic nature of the topography, the waste water treatment system will purify waste water through evaporation and avoid ground seepage of waste water.
- b. Plan to improve the public transport system

Trailer tractor will be provided as provided as public transport mode.

The outline of the facilities of Rennell Island is shown in Table IV.3.4.1.

(4) Operational plan

The Rennell provincial government will be responsible for the management and operations of the planned facilities and they will be implemented by a provincial government officer. However, the multi-purpose assistance center will be operated and maintained by the community. The organizational plan is shown in Fig.IV.3.4.4.

1) Cargo unloading/loading yard of Kanggava Bay

Presently, the cargo yard is used only when the passenger/cargo ship arrives once a month on its regularly scheduled route. The transport schedule of this ship is communicated by wireless radio and it has been concluded that reinforcing the existing operational system will increase the volume of cargo handled at Kanggava Bay.

During the initial stages of the project, the provincial Fisheries Center will carry out the maintenance of the barge, while its operation will be supervised by provincial government officers.

2) Improvements related to fisheries development

The fishery officer in charge of the Lavanggu Fisheries Center has received some training under Japanese technical cooperation. Measures to develop and protect the fishery resources of Lake Tengano should be undertaken carefully and a survey on its fishery resources is required. The base of operations will be centered in Lavanggu and a supplementary system to promote fisheries in Lake Tengano should be undertaken in gradual stages. Development of fresh water fisheries which takes into account the valuable natural environment and resources that characterize Lake Tengano is recommended.

3) Multi-purpose regional social assistance center

The centers will be owned and managed by the provincial government and they will be maintained daily by personnel selected from the community of each village.

- The overall management and operations of each of the four provincial government centers will be carried out by two management personnel and four trailer tractor drivers.
- Two management personnel of each center will be selected from the community and they will be responsible for the center's daily management and operations.

Presently, the trailer tractor is operated by one provincial government worker and the number of operators will be increased.

- The trailer tractor currently in use will be used exclusively for transporting cargo or kept in reserve. The two new trailer tractors will operate in west Rennell (Kanggava, Tinggoa, Tahanuku, Lavanggu) and east Rennell (Lavanggu, Tengano). The present operating schedule of one round-trip

trip journey from Kangua, Tingoa, to Lavanggu per day will be increased to two round-trip journeys per day.

- Maintenance and repair inspections will be carried out at the main multi-purpose regional social assistance center which will be equipped with a workshop.

3.4.4 Consideration of Other Factors

Mini-infrastructural facilities in Rennell Island that require simple improvements and renovations by the government of Solomon Islands are listed below.

(1) Roads

- 1) Road improvement 1 between Tingoa and Lavanggu: Depressed areas and areas where water puddles are prevalent will be installed.
- 2) Road improvement 2 between Tingoa and Lavanggu: Steeply inclined areas will be paved and water drainage on the west side of the road.
- 3) Road improvement 3 between Tingoa and Lavanggu: The road is presently wide enough to accommodate only one trailer tractor. Some areas of the road will be extended to 200m in width to allow the passing of vehicles, in anticipation of an increased traffic volume.
- 4) Passenger/cargo pickup stop for public transport: The waiting area in each village will be renovated to include shade for waiting passengers.

Simple road repairs are currently underway and after the road between Lavanggu and Tingoa has been completed, it will be both economical and practical to use the heavy machinery employed there for construction of the aforementioned.

(2) Water supply facility

Installation of water pump: A few of the manual water pumps can be easily repaired by simply replacing the packing. A supply of spare parts and maintenance work is required.

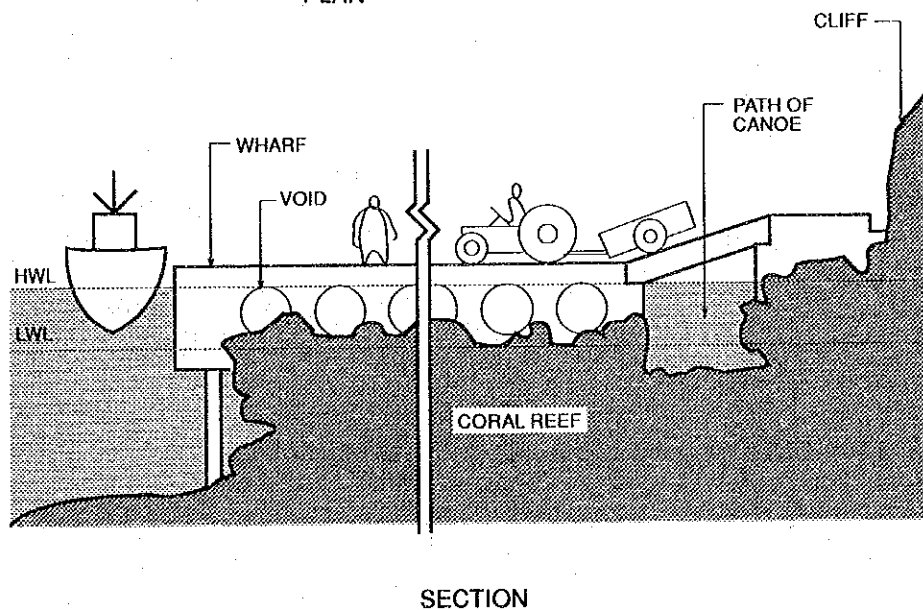
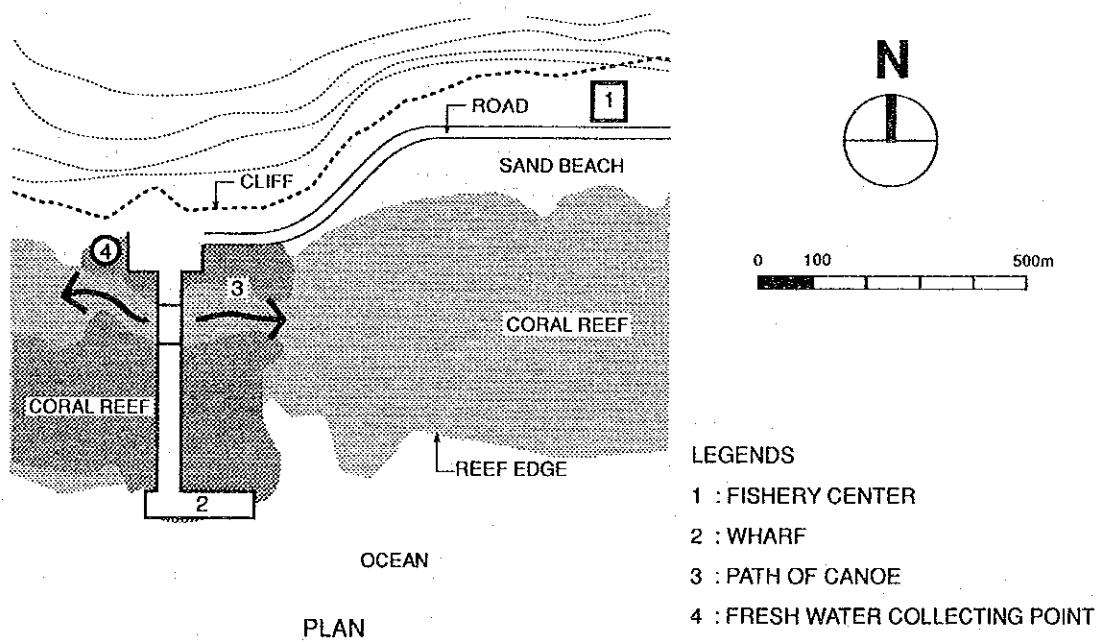
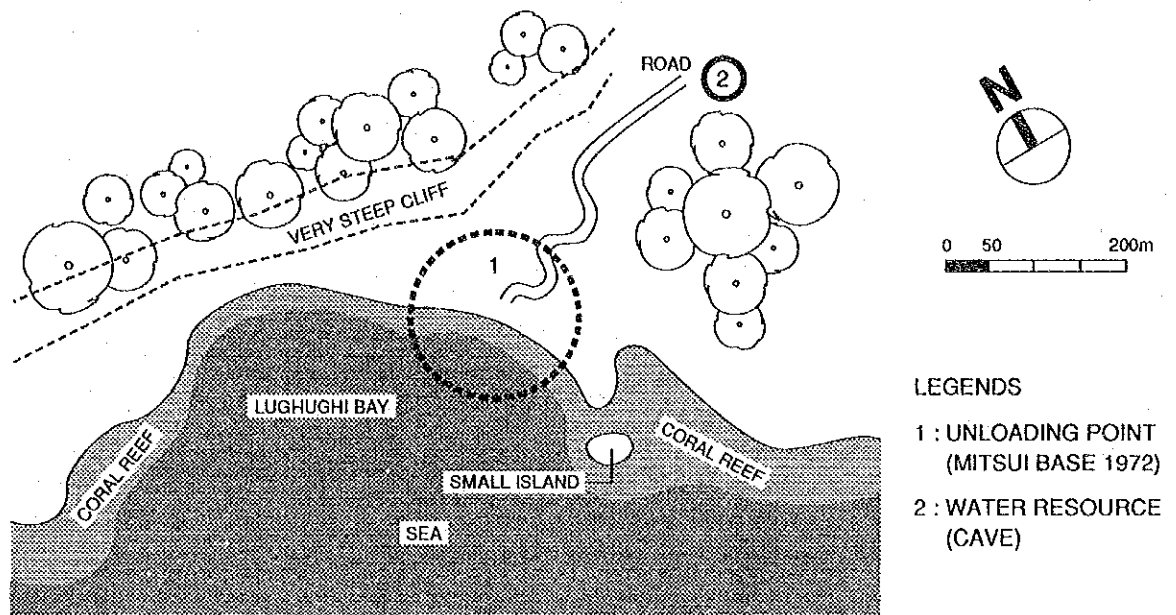
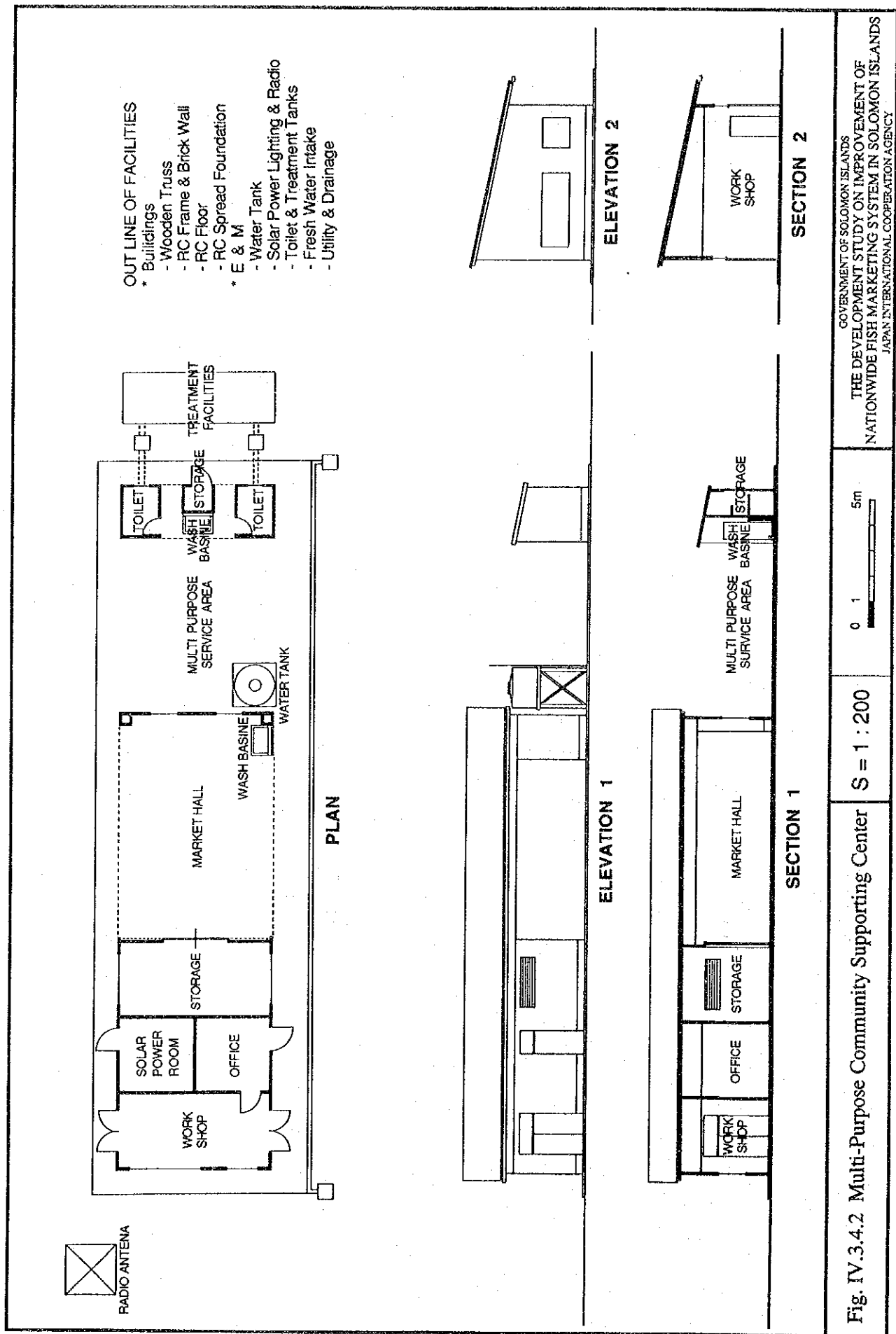
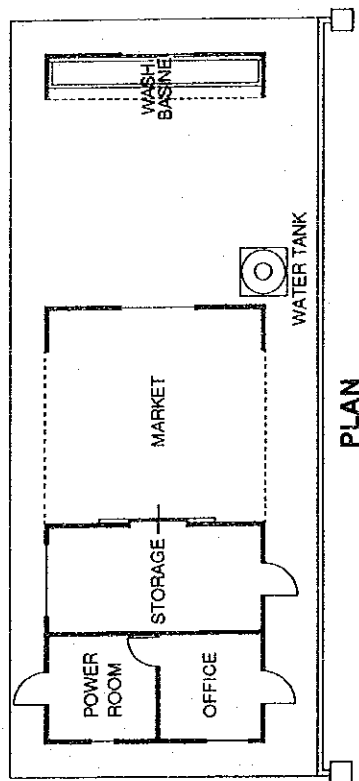


Fig. IV.3.4.1 Location of Lughughi Bay and Plan of Wharf at Kanggava Bay

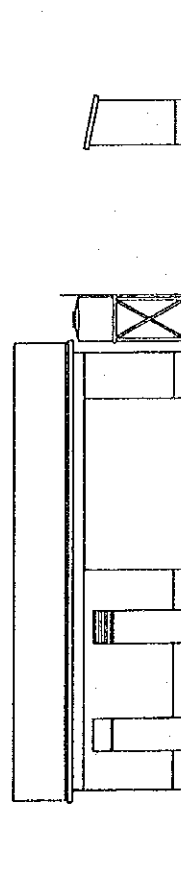


OUT LINE OF FACILITIES

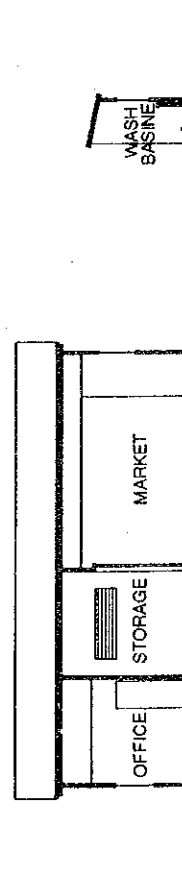
- * Buildings
 - Wooden Truss
 - RC Frame & Brick Wall
 - RC Floor
 - RC Spread Foundation
- * E & M
 - Water Tank
 - Solar Power Lighting & Radio
 - Utility & Drainage



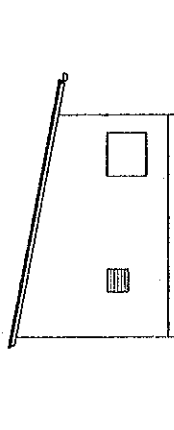
PLAN



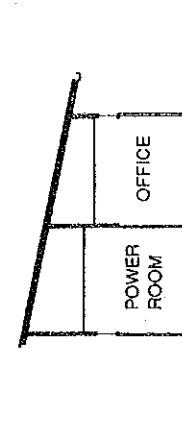
ELEVATION 1



SECTION 1



ELEVATION 2

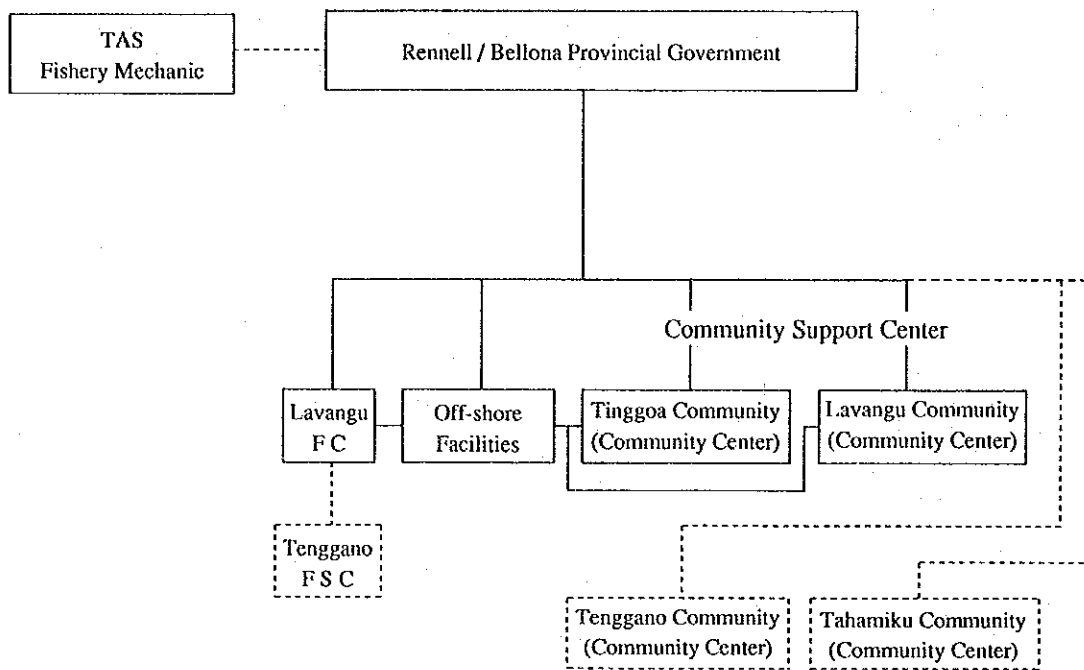


SECTION 2

Fig. IV.3.4.3 Multi-Purpose Community Supporting Sub-Center

S = 1 : 200





Remarks : TAS ; Technical Assistance Staff (Volunteer) dispatched from Honiara F.D.

Fig. IV.3.4.4 Organization Plan of Model Zone 4

Table IV.3.4.1 Outline of Facilities at Rennell Island

Item	Component	Detail
FISHERIES DEVELOPMENT PLAN		
1. Improvement of the existing road from Lavanggu village from the cliff to the sand beach area	Approx. 400 m length and 4 m width	<ul style="list-style-type: none"> • Concrete pavement • Rainwater discharge ditch
2. Barge Unloading Station & Stockyard	960 sq m RC slab with block	<ul style="list-style-type: none"> • Concrete pavement • Drum can stock area • Material stock room • Workshop • Rainwater Tank • Washing Area • PVC piping
3. Plumbing Work	<ul style="list-style-type: none"> • To connect Barge Unloading Station to Fisheries Centre 	
4. Equipment	<ul style="list-style-type: none"> • Small barge with ramp, winch and outboard engine • Solar lighting system (2 units) 	<ul style="list-style-type: none"> • FRP, 4 x 6 m, with fender wood protection
5. F/C Freshwater intake system	Plumbing work	<ul style="list-style-type: none"> • Lighting pole, battery and FL-20W lamp
6. F/C Training Equipment	<ul style="list-style-type: none"> • Training gears • FRP boat with outboard engine 	Hand pump at well located approx. 300 m
7. F/C Solar Powered Equipment	<ul style="list-style-type: none"> • Lights • Wireless communication 	Antenna to be located on the hill
COMMUNITY ASSISTANCE PLAN		
1. MCAC Buildings (2 main centers and 2 sub centers)	Main Centers: 1 storey, 150 sq.m, Spread R.C. foundation, R.C. frame, brickwall, wood truss (Sub Centers: Similar except only 60 sq.m)	Workshop, power-station, office, storage, market, utility, toilet (Sub Centers similar except without toilet)
2. MCAC Solar Powered Facilities	<ul style="list-style-type: none"> • Wireless radio (2 sets) • Lighting 	Only at Main Centers
3. Water intake system and tank		
4. Equipment	<ul style="list-style-type: none"> • Workshop tools 	<ul style="list-style-type: none"> • Engine type welding set, portable generator, tool set, work table & bench, chain saw, hand trolley
	<ul style="list-style-type: none"> • 4 WD double cab pickup truck (2 Units) 	<ul style="list-style-type: none"> • Diesel engine, 4 passengers cabin, 500 kg cargo, spare parts
	<ul style="list-style-type: none"> • Bicycles (16 no: each center to have 4 no. each) • 2 wheel cargo cart (4 no: each center 1 each) • Tractor (2 no: Only at Main Centers) 	<ul style="list-style-type: none"> • 4 no., robust construction type with single gear • 200 kg capacity, with connection to bicycle • Kubota M4030 type with front counter weight (for stability on steep slope), spare parts
	<ul style="list-style-type: none"> • Trailer (2 no: Only at Main Centers) 	<ul style="list-style-type: none"> • Adjustable shock absorbers, passenger seats (bench)
Recommended Landing Wharf at either Kangava or Lughughi Bay		
A. Armour stone jetty at western side of Kangava Bay	<ul style="list-style-type: none"> • Jetty 4 m width extending to edge of reef 	<ul style="list-style-type: none"> • Concrete and armour stone construction • Jetty embankment to have flow through void • Underpass for canoes to go through to other side of the bay
	<ul style="list-style-type: none"> • Service yard at shore end of jetty • Road connection 	<ul style="list-style-type: none"> • For temporary storage • From existing road to jetty
B. Lughughi Bay (Old Mitsui base)	<ul style="list-style-type: none"> • Improvement of existing harbour 	<ul style="list-style-type: none"> • Landing wharf • Slipway
Remarks for Landing Wharf Recommendation:		
1. Detailed survey will need to be conducted to acquire boring data of reef and rough weather / climatic data before the above landing wharf can be implemented.		
2. Subsequent to the above survey, evaluation of Kangava Bay and Lughughi Bay to be done to determine the best site for the landing wharf.		

4. PROJECT COST ESTIMATES

The Project costs were calculated based on the following factors.

- (1) Project costs were calculated as of October 1993. (Consumer cost of living increased an annual 8 to 10 percent.)
- (2) The exchange rate was SI\$1.00 = 37 yen.
- (3) Imported equipment and materials are tariff free.
- (4) Construction work is to be carried out by a foreign contractor.
- (5) Based on data provided by the Ministry of Construction and related agencies and local contractors, local costs were determined using an improved prototype formulated by the consultant; and each construction cost included such factors as construction and transport methods and land lot conditions.
- (6) Cost of imported equipment and materials was based on CIF and Honiara prices.
- (7) Basic costs were based on standard Honiara costs and calculations of rural construction costs in the other islands took the increased coefficient used by the Solomon Island government in rural construction work into consideration.
- (8) The ratio of direct and indirect costs (temporary construction costs, on site expenses, cost of sending specialist, general management costs, etc.) were determined based on interviews with local builders and consultants and past local construction costs in similar regions.
- (9) Preparation costs estimated to be 10 percent of the total construction costs.

Project costs (construction, materials) are shown in Tables IV.4.1 -IV.4.6.

Table IV.4.1 Summary of Cost for All Zone Projects

Projects	Unit: SI\$ SI\$
Zone 1	
Honiara Central Market	14,848,850.00
Zone 2	
Tulaghi Base	2,205,800.00
Satellites	1,116,700.00
Zone 3	
Noro Base	2,171,155.00
Satellites	840,200.00
Zone 4	
Fisheries Development Plan	3,100,557.00
Community Assistance Plan	3,147,790.00
Total of Zone 1+2+3+4 Projects	27,431,052.00
Contingency (10%)	2,743,105.20
Consultant Fee	3,017,415.72
Grand Total Cost	33,191,572.92

Remarks: Constant price as of Oct. 1993.

Table IV.4.2 Cost Breakdown For Facilities at Honiara Central Market

Facilities Items	Total
1. Market Hall	4,750,000
2. Fish Market	618,000
3. Service Facilities -A&B	
Building	3,570,500
Plant & Equipment	
Ice Making	282,000
Cold Storage	304,000
4. Market Service Facilities	1,890,000
5. External Work	2,300,000
6. M&E Work	
Freshwater Supply	100,000
Rainwater Discharge	150,000
Waste Water Treatment	75,000
Sea Water Intake	70,000
Sub-total (1 - 6)	14,109,500
7. Special Facilities	
Wireless Radio,Solar Light	54,000
Fire Extinguishers	10,000
Eskies (\$1000 each)	40,000
Pallet	3,000
Handlifter	10,800
Truck	81,000
Transport Boat + winch	540,550
Sub-total (7)	739,350
total (1-7)	14,848,850
8. Contingency (10%)	1,484,885
9. Consultancy Fee (10%)	1,633,374
Total Component Cost	17,967,109

Remarks:

- 1 Constant price as of Oct. 1993.
- 2 Building cost includes electrical, plumbing and sewage services of the building
- 3 Plant/Equipment cost includes supply and installation
- 4 Price escalation is estimated to be 8 percent per year.

Table IV.4.3 Cost Breakdown For Facilities at Florida Islands

Facilities Items	Unit: SI\$ Total
TULAGHI BASE	
1. Building (1 no.)	630,000
2. Shore work/jetty	990,000
3. Cold/Ice storage (1 no.)	328,300
4. Truck crane (1 no.)	87,500
5. Radio (1 no.)	27,000
6. Carrier boat - Hull (3 no.)	75,000
7. Carrier boat - Engine (6 no.)	42,000
8. Water tank (2000 gal) (1 no.)	6,000
9. Esky (20 no.)	20,000
Sub-total (1-9)	2,205,800
SATELLITES	
10. Buildings (6 no.)	560,000
11. Ice storage (6 no.)	177,700
12. Radio (6 no.)	324,600
13. Water tank (600 gal) (6 no.)	14,400
14. Esky (40 no.)	40,000
15. Sub-total (9-13)	1,116,700
16. Contingency (10%)	332,250
17. Consultancy Fee (10%)	365,475
Total Facilities Cost	4,020,225
Remarks:	
1 Constant Price as of Oct 1993	
2 Building cost includes electrical, plumbing and sewage services of the building	
3 Plant/Equipment cost includes supply and installation	
4 Price escalation is estimated to be 8% per year	

Table IV.4.4 Cost Breakdown For Facilities at Western Province

Facilities Items	Unit: SI\$ Total
NORO BASE	
1. Building (1 no.)	377,055
2. Cold/Ice storage (1 no.)	350,000
3. Truck crane (1 no.)	87,500
4. Radio (1 no.)	27,000
5. Water tank (2000 gal) (1 no.)	6,000
6. Esky (150 no.)	157,500
7. Truck (1 no.)	85,000
8. Transport Boat (2 no.)	1,081,100
Sub-total (1-8)	2,171,155
SATELLITES	
9. Buildings (6 no.)	499,200
10. Ice storage (6 no.)	108,600
11. Radio (4 no.)	108,000
12. Water tank (600 gal) (6 no.)	14,400
13. Esky (100 no.)	110,000
Sub-total (9-13)	840,200
12. Contingency (10%)	301,136
13. Consultancy Fee (10%)	331,249
Total Facilities Cost	3,643,740
Remarks:	
1 Constant Price as of Oct 1993	
2 Building cost includes electrical, plumbing and sewage services of the building	
3 Plant/Equipment cost includes supply and installation	
4 Price escalation is estimated to be 8% per year	

Table IV.4.5 Cost Breakdown of Facilities at Rennel Island

Facilities Item	Total (SI\$)
FISHERIES DEVELOPMENT PLAN	
1. Improvement of the existing road from Lavanggu village from the cliff to the sand beach area	1,215,000
2. Barge Unloading Station & Stockyard	981,837
3. Plumbing Work	48,600
4. Equipment	334,120
5. Freshwater intake system	270,000
6. Training Equipment	89,000
7. Solar Powered Equipment	162,000
Sub-total (1 - 7)	3,100,557
COMMUNITY ASSISTANCE PLAN	
8. MCAC Buildings (4 no:2 main,2 sub)	1,347,600
9. MCAC Solar Powered Facilities	649,540
10. Water intake system and tank	438,150
11. Equipment	297,300
12. Trailer Tractor	415,200
Sub-total (8 - 12)	3,147,790
13. Contingency (10%)	624,835
14. Consultancy Fee (10%)	687,318
Total Facilities Cost	7,560,500
Remarks:	
1 Constant Price as of Oct 1993	
2 Building cost includes electrical, plumbing and sewage services of the building	
3 Plant/Equipment cost includes supply and installation	
4 Price escalation is estimated to be 8% per year	

5. PROJECT EVALUATION

An economic evaluation was carried out in order to determine the appropriateness of each alternate plan of the project from a national economic standpoint. In addition, a financial analysis was made of the public corporation's operations in order to study its viability.

An economic evaluation was carried out in Model Zone 1 (the entire Honiara Central Market), Model Zone 2 (development project in Florida Island), and Model Zone 3 (development project in Western Province).

A financial evaluation of the HFMA (Honiara Fish Marketing Authority) which is responsible for managing project operations in Model Zones 1 and 2 was carried out, due to the large scope of its management and activities. A social evaluation was carried out in Model Zone 4. The direct benefits derived from implementing each project and the environmental assessment results have been included in the evaluation of the project.

5.1 Economic Evaluation

Economic evaluation was conducted for both the project costs of Honiara Fish Marketing Authority (HFMA) and Honiara Central Market (HCM), and major direct benefits accrued through opportunity cost. The evaluation index is the Economic Internal Rate of Return (EIRR) based on the following assumptions for the HFMA project.

(1) Model Zones 1 and 2 : HFMA and HCM projects

1) Direct benefits

The following assumptions have been considered for the HFMA and HCM project

	Without Project	With Project
1) Time cost saving		
a) Fishermen	Fishermen stay in Honiara 2 to 3 days to sell an esky of fish, before return to fishing village	No marketing trips to Honiara due to purchase and retail of fish by HFMA.
b) Retailers	Eskies are left exposed in the sun all day and are arranged in a haphazard and unsystematic manner which contributes to congestion of access ways. Fish is improperly displayed for customers, suffers from quality loss and there is a high volume of unsold fish.	HFMA will handle the fish and display esky and fish in systematic manner under proper shelter to avoid direct sun exposure
c) Exporters	Exporters confront problem in securing stable and regular supply of fresh of high quality.	HFMA , with its regular & systematized marketing will be able to supply the exporters.

	Without Project	With Project
1) Time cost saving (cont.)		
c) Customers	Customers move from one esky to another sorting and selecting fish resulting in time loss for both the customers and retailers and in fish quality.	Customers move, sort, and select fish with ease.
	No proper drainage around eskies cause unsanitary and unpleasant odour.	With proper facilities and arrangement, sanitary and esthetic condition will be maintained.
2) Fuel saving	Time and fuel consumed in transporting fish from fishing village to Honiara, and return trip via Tulagi where ice is purchased for next fish collection and transport to Honiara.	HFMA purchases and collects fish using carrier boats at the village level and transports in large volume using transport boat to Honiara.

2) Physical life of project components

The physical life of respective project components is listed in Table A-9.1 and Table A-9.5 of Annex-9.

3) Prices

All costs and benefits are indicated at the constant price of 1993.

4) Project economic cost

The financial cost of the project is converted to economic cost by applying the economic conversion factor of 0.85 provided by Ministry of Finance (MOF). Transfer costs within the national economy, such as interest, insurance and tax are excluded from the economic cost. The financial and economic cost are summarized below, and the details are listed in Annex 9 (Tables A-9.2 and Tables A-9.6).

Projects	Financial Cost	Economic Cost
1) HFMA	SI\$10,449,320	SI\$8,881,922
2) HCM	SI\$23,169,960	SI\$19,694,466

Remarks: HFMA project cost includes one-third of the total construction cost of wharf (SI\$2.0 million)

5) Economic benefits

a) Time cost savings: Savings in opportunity costs due to reduction in waiting time.

At present fishermen from Florida Islands bringing their catch to Honiara Central Market, are required to stay in Honiara two to three days in order to sell their catch. An esky is accompanied by at least two fishermen. During

their stay, the eskies are temporarily stored for SI\$5 per esky and fishermen stay with friends/relatives or sleep outdoors. This time loss in Honiara contributes to a reduction in fishing hours (i.e. a drop in fish harvest efficiency). This loss will be considerably alleviated with implementation of the HFMA project.

Under the HFMA project, the HFMA will purchase and collect the fish catch using collection boats and store it at Tulagi base; eliminating the need for fishermen to market their fish in Honiara. As a result, the time loss experienced by fishermen is reduced and they save about four days a week. These four days contribute to four added days of fishing. The catch per fishing trip is about 15 kg, and as a result, the fish production can be increased to 120kg in four days by two fishermen. Subsequently, the estimated increase in fish catch in 2000 is 181 mt and in 2010 is 312 mt. The annual benefit in 2000 is estimated to be SI\$0.904 million and SI\$1.56 million in 2010 (Table A-9.14 in Annex - 9).

b) Fuel saving due to collection/transport by HFMA

The fisherman transporting fish to Honiara take a circular route from their village to Honiara where he sell the fish, and returns to the village via Tulagi where he purchases ice for his next fish collection and transport to Honiara. The details of the estimated fuel consumption is explained in Table A-9.17 of Annex - 9. Without the project, it was estimated that fishermen would consume 114,712 liters in 2000 and 210,496 liters in 2010 to transport the planned volume of 227 mt of fresh fish in 2000 and 423 mt in 2010. With the project, the HFMA will purchase and collect the fish at the villages using collection boats and will store in Tulagi en route to Honiara; subsequently, the estimated fuel consumption will be about 32,520 liters in 2000 and 2010. The quantity of fuel saved is 82,192 liters in 2000 and 111,181 liters in 2010, and fuel cost savings is estimated to be SI\$99,411 in 2000 and SI\$195,774.

c) Fuel saving due to use of storage facilities by retailers

About 90 percent of retailers indicated they require about two days to sell an esky of fresh fish. As there are no storage facilities in the market, the eskies are stored with friends or relatives in their homes. These eskies are transported for SI\$20 an esky by car/van for an average distance of 6 km (to and fro). With the project, the eskies can be stored in the cold storage at the market. This will alleviate the inconvenience and will save transport cost and

fuel. Assuming that 50 percent of the fresh fish eskies in the Honiara Central Market are stored, the estimated quantity of fuel saved is 3,570 liters in 1995, 4,140 liters in 2000 and 7,160 liters in 2010,. The fuel cost savings is SI\$3,927 in 1995, SI\$4,554 in 2000 and SI\$7,786 in 2010 (Table A-9.19 of Annex-9).

d) Value added from export

Some fresh fish are in high demand overseas and they are being exported by a few exporters in Honiara who depend mainly on a fish supply from their own fishing boats and/or through fishing arrangements with the provincial governments. The major problem confronting exporters is not only inadequate and irregular supply but also quality of fish. With the project, the HFMA with its regular marketing and systematized handling practices should be able to supply these exporters regularly. Assuming that about 10 percent of the fresh fish coming to Honiara will be of high quality fish suitable for export, it is estimated that HFMA will be able to supply the exporters 36 mt in 1995, 41 mt in 2000 and 72 mt in 2010. This supply will increase the exporters' share of the export market and thereby, the value added benefits is estimated to be SI\$135,774 in 1995, SI\$157,320 in 2000 and SI\$271,890 in 2010 (Table A-9.20 of Annex - 9).

e) Time cost saving by consumers

Due to congestion of access ways caused by haphazard and unsystematic manner of arrangement of eskies, consumers of visiting market to buy fresh fish experience time loss in terms of moving, sorting and selecting fish from one esky to another. It is estimated, based on fish consumption survey, that a household head in Honiara visits at least two times a week to purchase fresh fish. Assuming that a consumer saves five minutes a visit to the market, the total time saved in terms of man days, based on number of household in 1992 of 5,253, is 5,690 man days. The annual time cost at SI\$10 a day is SI\$56,900. The estimated numbers of households in 2000 and 2010 are 7,725 and 9,988, respectively, and the time saved are 8,369 man-days in 2000 and 10,820 man-days in 2010. The annual time cost saving are SI\$83,686 and SI\$108,203 in 2000 and 2010, respectively. (Table A-9.15 of Annex - 9). Similarly the time saving of general consumers is shown in Table A-9.16 of Annex-9.

The summary of the economic benefits are shown below, and the details are explained in Table A-9.13 of Annex - 9.

Total economic benefits by HFMA project

Items	Unit: SI\$		
	1995	2000	2010
Time cost saving			
- Increase catch	780,000	904,000	1,560,000
- Consumer	56,908	83,688	108,203
Fuel saving			
- Collection/transport	73,022	90,411	195,774
- Storage/transport	2,189	2,530	4,378
Value added	135,774	157,320	271,890
Total	1,047,893	1,237,949	2,140,245

Total economic benefits by HCM project

Items	Unit: SI\$		
	1995	2000	2010
Time cost saving			
- Increase catch	780,000	904,000	1,560,000
- Consumer (fish)	56,908	83,688	108,203
- Consumer (general)	170,723	251,063	324,610
Fuel saving			
- Collection/transport	73,022	90,411	195,774
- Storage/transport	2,189	2,530	4,378
Value added	135,774	157,320	271,890
Total	1,218,616	1,489,012	2,464,855

6) Evaluation results

a. EIRR

The economic evaluation of the HFMA project and HCM is shown in Tables A-9.4 and A-9.8 of Annex - 9.. The EIRR (Economic Internal Rate of Return) of HFMA project and HCM is shown below.

Projects	EIRR
1) HFMA	9.67% (11.95%)*
2) HCM	5.96

Remarks: * indicates exclusion of wharf construction cost.

The EIRR of HFMA project (including the wharf) is estimated to be 9.67 percent. In case of project with exclusion of the wharf construction cost, the EIRR is 11.95 percent. The EIRR of HCM is 5.96 percent (including the wharf).

b) Sensitivity Analysis

The calculation of the EIRR was based on the most probable value of key factors. Sensitivity analysis for HFMA project was carried out to evaluate the extent of the changes in the EIRR if key factors change within a reasonable range. The key factors and their percentages were considered and the results are shown below.

	Investment Cost	Benefit	EIRR
Base case	-	-	9.67%
Case 1	-	+10%	11.20%
Case 2	-10%	-	10.87%
Case 3	-10%	+10%	12.48%
Case 4	+10%	-	8.64%
Case 5	-	-10%	8.06%
Case 6	+10%	-10%	7.09%

c) Benefit distribution

The economic benefits accrued in the project are characterized by opportunity cost in terms of time saving cost, fuel saving cost and value added of export. In 1995, about 80 percent of the economic benefit is accorded to fishermen, and the remaining 20 percent is to consumers and exporters. Consequently, the HFMA project is economically justified.

(2) Model Zone 3 (WPFMA project)

In the economic evaluation, increase catch and value added through exports of high quality fish are the two direct benefits arising from the WPFMA project. The estimated increase catch in 1995 is 48 mt, 87 mt in 2000 and 165 mt in 2010, and the estimated volume of export is about 20 percent of the catch which amounts to 10 mt in 1995, 18 mt in 2000 and 33 mt in 2010. The EIRR of the WPFMA project is estimated to be 0.95 percent (Table A-9.12 of Annex - 9). With this rate of EIRR, the project is not feasible; however the EIRR is about 9 percent when the catch is increased 50 percent, and about 16 percent with 100 percent increase in catch.

5.2 Financial Evaluation

The following assumptions were considered for the calculation.

- The project cost is funded by the government.
- Physical life of the project components is shown in Annex 9.
- Depreciation: Depreciation cost are estimated by the fixed amount method.
- Prices: All costs and benefits are indicated at the constant price of 1993.

(1) Model Zones 1 & 2 : Financial Evaluation of HFMA project

A financial evaluation of the HFMA project under four cases was carried out. The four cases are as listed below, and the details are indicated in Table A-9.21 of Annex - 9.

	Satellite	Tulagi base	Honiara base
Case-1	Fishermen transport fish using own boat direct to Honiara	No	HFMA purchases and retails the fish from fishermen. Supply ice to fishermen
Case 2	Fishermen transport fish using boats leased by HFMA direct to Honiara	No	HFMA purchases and retails the fish from fishermen. Supply ice to fishermen
Case 3	Fishermen transport fish using boats leased by HFMA to Tulagi base	Base established. Fish is purchased from fishermen and stored for timely transport to Honiara by HFMA using transport boat.	HFMA retails the fish. Supply ice to fishermen
Case 4	HFMA purchases fish at village level and transfers them to Tulagi base	The stored fish is transported on time to Honiara by HFMA using transport boat.	HFMA retails the fish. Supply ice to fishermen

Remarks: Under Cases 3 & 4, the transport boat will be able to carry some passengers and cargo. Subsequently, some revenue earnings can be expected.

Assuming that HFMA purchases the planned supply of fresh fish in 2000 and 2010, the above four cases showed profit after depreciation.. Therefore, each case will be in a financially sound state. Sensitivity evaluation, based on 80 percent of fresh fish purchase of total flow to Honiara by the HFMA also indicate sound financial state of project (Table A-9.22) of Annex - 9).

(2) Model Zone 3 : Financial Evaluation of WPFMA project

The financial evaluation of the WPFMA project is shown in Table A-9.23 of Annex - 9., and the major revenue is mainly from local sales and export of high quality

fish. In 1995 the project shows a small profit before/after depreciation, as the project will use the Kuarao and there will no new facilities constructed. In 2000, the project will function with new facilities and two new boats, and it shows a large profit before depreciation but not after depreciation.

(3) FIRR

The FIRR (Financial Internal Rate of Rate) of the HFMA project is carried out, and the details are shown in Tables A-9.24, A-9.25 and A-9.26). The FIRR of the project is about 13 percent which is more or less close to the lending rate in Solomon Islands (14%). Therefore this project is viable financially.

(4) Model Zone 4 (Rennell development project)

The Rennell development project (cargo handling at Kanggava Bay, fisheries development and community assistance plan) is not anticipated to generate revenue. However, it would contribute greatly to social development. The estimated annual operation and maintenance cost of the project is about SI\$342,000, of which fuel cost is 26 percent, salary/wages 12 percent and maintenance 62 percent.

(5) Foreign exchange earning

The foreign exchange earning through export of high grade fresh fish (value added) is estimated to be about SI\$157,000 in 2000 and SI\$271,890 in 2010.

5.3 Social evaluation

The effects of development measures implemented in Rennell Island on its society have been evaluated as follows. Promotion of fisheries stemming from supplementary renovations and improvements of the Fisheries Center and transport means are anticipated to stimulate the distribution of fish and other goods throughout the island and to contribute to is social development.

Improved cargo loading facilities will enable organized and safe loading and unloading operations. Installing a warehouse and cargo yard will allow adjustments in the shipment of agricultural products. These development measures are anticipated to expand inter-island marketing opportunities, increase income, and raise the living standards of the island's inhabitants.

6. ENVIRONMENTAL IMPACT ASSESSMENT

The environmental effects of the development on the model areas of Honiara, Florida Islands, Western Province and Rennell Island have been assessed on a zone basis whenever appropriate taking into account the similarity of the areas composing the zone or sub-zones.

6.1 Model Zone 1 - Honiara

For the Honiara area, the Study proposes the rehabilitation of the Honiara Central Market. To ease the congestion at the market area due to the limited land area, the layout of the existing facilities to be redesigned for effective use of the market area. Separating the sellers' area from the car park, incorporation of storage facilities for the commodities, shade for the sellers' area, more standpipes, dedicated rubbish areas with rubbish bins, treatment of waste water before discharge to the sea and paving the area will improve the usage and condition of the market for the benefit of the users. The improvement to the beach area will help fishermen with the unloading of their eskies, maximise the use of the beach area and ensure a cleaner sea front.

The environmental impact of the development is mainly connected with the physical facilities. Careful planning and design will minimise the negative effects of these especially the change of shore processes that will be affected by the building of the quaywall and ramp. Waste treatment facilities will ensure cleaner waste discharge from the market into the sea. Generally, the facilities will improve the amenities and general hygiene of the market.

As the market is already in existence, the short term impact of the rehabilitation of the market on the community, economic and marketing aspects will be minimal, if any. In the medium to long term, the development of a more sophisticated marketing and distribution network in the market will invariable effect these aspects. (Refer Table A-10.1 of Annex-10).

6.2 Model Zone 2 - Florida Islands

To improve the distribution system of the fresh fish coming to Honiara from the Florida area, the Study proposes the introduction of a fish carrier vessel to service this area. A fishery collection centre to be provided in Tulaghi which will act as the intermediate collection point for the fish before finally shipping it to Honiara Central Market. Small fishery satellites to be built to contain eskies at the villages of Humba, Peula, Vura, Olevugha, Soso, and Tulaghi. These satellites will also have a place to sort

fish into the eskies.

The carrier vessels are envisaged to be introduced in the medium term after the necessary marketing institutions are in place. The impact of these vessels will be to reduce the need and frequency of individual fishermen making trips to Honiara to sell fish. The positive social impact of this will be a reduction in the loss of lives due to rough weather during the trip to Honiara and affording the fishermen more time to go fishing and to do other activities (such as gardening or community work). The negative impact would be the lost of opportunity to visit Honiara by the fishermen other than the purpose of selling fish (such as visiting one-talk, shopping, socialising, etc.).

The site of the satellites in the villages to be decided in consultation with the villagers in order not to have land disputes or ownership claim on the common facilities which is to be managed by the community. Solar power wireless communication set and a rain water tank will be incorporated into these satellites. The communication set will not only inform the villagers of the schedule of the carrier vessels but will also serve the general needs of the community. (Refer Table A-10.2 of Annex-10).

6.3 Model Zone 3 - Western Province

Western Province fish distribution will be improved by provision of regular fish collection service to be provided by the existing vessel, Kuarao. In the medium term, after Kuarao has served out its design life, a transport vessel to replace Kuarao will be introduced to continue the collection service to this zone. (Refer Table A-10.3 of Annex-10).

(1) Sub-Zone 1 - Gizo, Vella Lavella, Ranongga, Vonavona

The existing Fisheries Centre at Gizo will act as the collection center to serve the Vella Lavella, Ranongga, and Vonavona fishing community. Small fishery satellites similar to the one in Zone 2 to be provided in the villages of Mbuli, Surato, Vatoro, Moro, Simbilando, Lambulambu, and Arumana.

(2) Sub-Zone 2 - Noro, Munda

Noro will be the main collection point for the fish from Sub-zone 1 and will be provided with an administrative office cum market and possibly a fillet factory to process fish for export. As far as possible, the existing unused buildings at the Noro base will be converted and modified to accommodate these new facilities required.

6.4 Model Zone 4 - Rennell Island

To encourage the development of the fishing community on Rennell, a self-propelled barge to be based in Lavanggu Bay will be provided to assist in the loading and unloading of material to the ships that call at the Bay. Multi-purpose halls to be built at 2 strategic locations at Lavanggu and Tinggoa. Sub-centers will be built at Te'Nggano and Tahanuku. These halls will serve as a market for fish with solar powered lights, wireless communication, workshop, rainwater tank and hand-pump well (depending on the availability of ground water). These halls would also serve as disaster relief centres. Trailer-tractor and 4 wheel-drive truck to ferry fish, commodities and passengers will serve these halls.

The short-term effect of the proposal will be improved amenities especially the loading/ unloading in the sea, transportation between East and West Rennell, marketing of fish and better communication within the island. Medium to long term effects will be, the development of the fishery and other sectors in order to be able to export their produce to Honiara, and encouragement of other sustainable developments (for example eco-tourism). (Refer Table A-10.4 of Annex-10).

6.5 Fishery Resources

There is a stable fish production under existing fishing activities. Through careful resource management, there will be no significant resource deterioration due to increased fishing activities. However, resource management will be an urgent matter regarding non-migratory fish species.

7. IMPROVEMENT PLAN ON ORGANIZATIONAL SYSTEM AND OPERATIONS

7.1 Present Condition

- (1) Petty fisheries is basically comprised of subsistent fisheries and marketing activities. However, through the endeavors of foreign aid related agencies, technology transfer is currently being implemented in the area of fish production and processing activities; and a segment of petty fisheries is gradually evolving into small-scale commercial fisheries.
- (2) The population growth rate of the Solomon Islands is growing rapidly, and concentration of the population has been intense in the areas. As a result, the growth in demand for fishery products in the towns has been marked. As a result, the demand for fish marketing and transport activities to the towns from the production sites is burgeoning.
- (3) Efforts to foster private enterprises in the area of fish marketing and transport and to raise activity effectiveness in these areas have been lagging. In order to remedy this situation, it is urgently required that an organizational system to foster private distributors and transporters is improved.
- (4) Presently, there are five principal government officers in the Fisheries Division, seven managers in charge of each of the regional Fishery Centers, and approximately 33 general staff members (Fig.IV.7.1 & 7.2). The function of each Fishery Center in fish production has been fulfilled and it is necessary to reorganize and recruit personnel and to consolidate the centers in order to improve fish marketing.
- (5) Foreign technical assistance will be required for the present, but sustained management by Solomon Islanders will be implemented at the appropriate time.

7.2 Objectives

The objectives are to foster fish marketing and transport personnel in the private sector, increase fishermen incomes and provide a stable fish supply to consumers and exporters through a "fish marketing improvement program".

7.3 Strategy

- (1) An investigating committee will be established under the auspices of the Ministry of Natural Resources (MNR) and the Fisheries Division will organize a public corporation, whose objective will be to implement improvements in the regional

fish marketing network. Under this plan, the existing Fishery Centers will be incorporated into the public corporation.

- (2) Improvements in the fish marketing and transport system will be implemented in stages. For the initial period, the corporation will be the recipient of foreign assistance. However, when its commercial activities become viable, its role will be gradually restricted and basic activities will be turned over to the private sector.
- (3) Prior to and after the establishment of the public corporation, the Fisheries Division will be responsible for legal and organizational improvements in order to ensure the uninterrupted operation of the public corporation.

7.4 Plan of Action

- (1) Legal improvements in the legal system

Institute a "Fish Marketing Public Corporation Act", in order to establish a new public corporation.

- (2) Scope of activities by the public corporation and the provincial governments

The scope of activities which will be carried out by the provincial government and the public corporation in each of the model areas by the target year 2000 is outlined below and shown in Figs. IV.7.3, IV.7.4 & IV.7.5).

- 1) HFMA: Model Zones 1 and 2 will be under the direct management of the HFMA which will also directly support each of the Fishery Centers through its fish purchasing activities. Fish production will be the responsibility of fishermen and the HFMA will be responsible for fish collection at the production site, fish transport from the production site to Honiara, and fish marketing activities at the Honiara markets. In addition, it will cooperate with social and cultural activities at the markets.
- 2) WPFMA: Model Zone 3 will be under the management of the WPFMA and it will be responsible for technology transfer to fishermen in the areas of fish production and quality control, as well as collection and transport of quality fishery products to Noro. A system of cooperation with EC production sites through fish collection and transport activities will be set up.
- 3) Rennell/Bellona provincial government: Model Zone 4 will be under the jurisdiction of the Rennell/Bellona provincial government. A jetty, barge, and land facilities will be installed to improve the fish marketing system and the

island's position as a distribution point for ocean transported goods. In addition, community development will be carried out to improve the social living standards of the fishing village. All stages of the fish marketing model project, as well as all activities pertaining to improvements in the inhabitants' lifestyle will be under the management of the provincial government with the support of the Fisheries Division.

(3) Organizational improvements

The operations of the MNR, the public corporation, and the provincial government by the target year 2000 are shown in Fig. IV.7.6..

- 1) Committee on fish marketing and transport : MNR, relevant agencies, provincial governments, existing public corporations (DBSI, CEMA), processor/exporter, transporters, fishermen representatives, etc.
- 2) Public corporation on fish marketing and transport: Board of Directors will be composed of the same committee members on fish marketing and transport.
- 3) Placement of personnel
 - a. HFMA: One current manager will require retraining, and one new manager will be recruited and trained.
 - b. WPFMA: The existing staff personnel will undergo retraining and the general staff members will be recruited by relocating the existing personnel at the Fishery Centers.
 - c. Rennell Bellona provincial government: Management of the entire project will be the responsibility of the provincial government; and a total of four management personnel will be placed at each site. The staff will be gradually increased in conjunction with expanded activities. A part of the management positions will be filled by existing managers and the remaining positions will be filled by provincial government officers or by personnel recruited from the private sector. They will undergo a training and educational program to carry out their responsibilities.

(4) Improvement plan in stages

Transitions in the functions of the private corporation are given below. Privatization will be gradually implemented in stages - Phase 1 (the year 2000), Phase 2 (2000 to 2010), and Phase 3 (after 2010). The proposed procedure for stagewise institutional building is shown in Table IV.7.1.

1) HFMA

Phase 1: The HFMA will be responsible for all fish collection, transport, and marketing activities with the consent of fishermen. However, it will also be responsible for fostering future personnel in fish collection and transport activities.

Phase 2: A segment of the HFMA's fish marketing activities will be turned over to the private sector and a part of the management of the Tulagi base will be transferred to the provincial government.

Phase 3: The public corporation will be responsible for maintenance and control of facilities and only a segment of its fish wholesale functions in Honiara. In principle, fish wholesale and retail functions will be transferred to the private sector.

2) WPFMA

Phase 1: Although the Fishery Centers are currently under the jurisdiction of the provincial government, they will be jointly managed by the provincial government and the public corporation after its inception.

Phase 2: Fish collection and transport will be carried out entirely by the public corporation. However, fish production and collection at the production sites will be implemented by the fishermen.

Phase 3: Fish collection and transport operations will be continued by the public corporation.

3) Rennell Bellona Province

Phase 1: The project will be placed under the jurisdiction of the provincial government in conjunction with Fisheries Division support. The newly formed provincial government does not have management and maintenance capabilities. In view of these circumstance, infrastructure and facility improvements which will be easy to manage and maintained will be installed.

Phase 2 and 3: All required facilities will be renovated and they will be managed by the provincial government.

(5) Foreign technical assistance

Foreign technical assistance in the form of dispatched experts and training programs abroad for future core staff members will be implemented during the

preparatory stages of the public corporation and after its inception, until operational viability is established. Technology transfer in the areas of fish marketing and fishing and facilities and equipment will be provided.

1) Fisheries Division officer

As a central government officer, he will be expected to make supervisory visits as required and to take the appropriate measures to resolve any problems that may arise.

Solomon Island personnel: Personnel in charge of fish marketing, staff members (responsible for fishing, equipment and facilities)

Technical assistance personnel: Project manager (fish marketing), fishing, equipment, and facility experts.

2) Separate technical assistance organization of each zone: Personnel sent from the central government and an organization based on appropriate contact with headquarters.

Solomon Island personnel: Staff members who have completed training abroad.

Technical assistance personnel: Young experts or volunteers.

3) Combined foreign technical assistance which includes preparatory stages of the public corporation, dispatch of experts, and training abroad programs, operating funds, etc. is recommended.

(6) Financial measures

It has been determined that if an operating budget for the initial three months, following one year of operations by the HFMA, can be secured, it will become financially viable (Table IV.7.2).

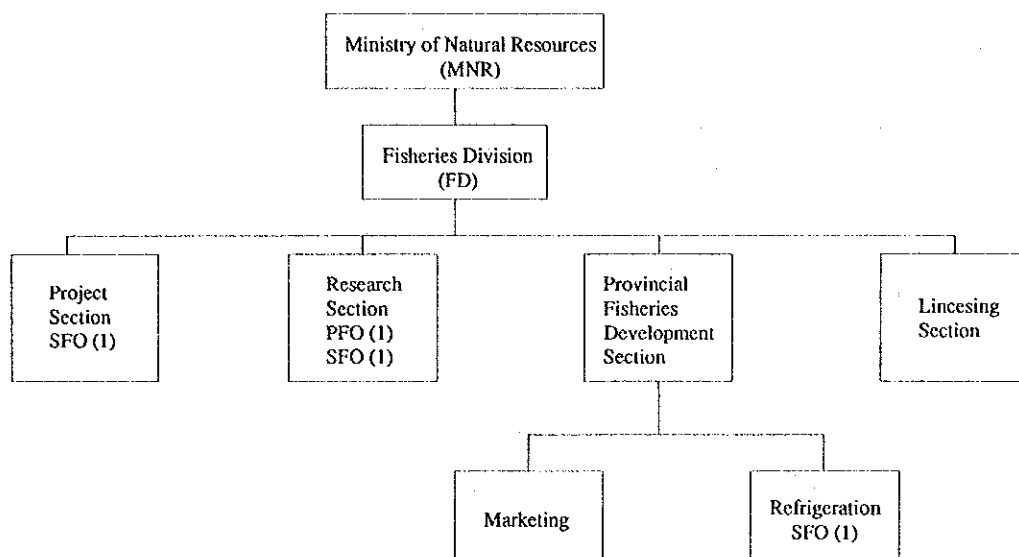
1) Handling volume : Some 50 percent of handling volume of fresh fish will originate from Florida Islands and other areas. However, this handling volume does not include export of fish.

2) Payment method : In the first three month quarter, the incoming revenue will be 50 percent of the sales. However, the payment to fishermen will be immediate by cash.

3) Personnel cost : Fixed cost will be for two managers, and general staff costs are variable; and they will be paid from revenue generated from fish sales.

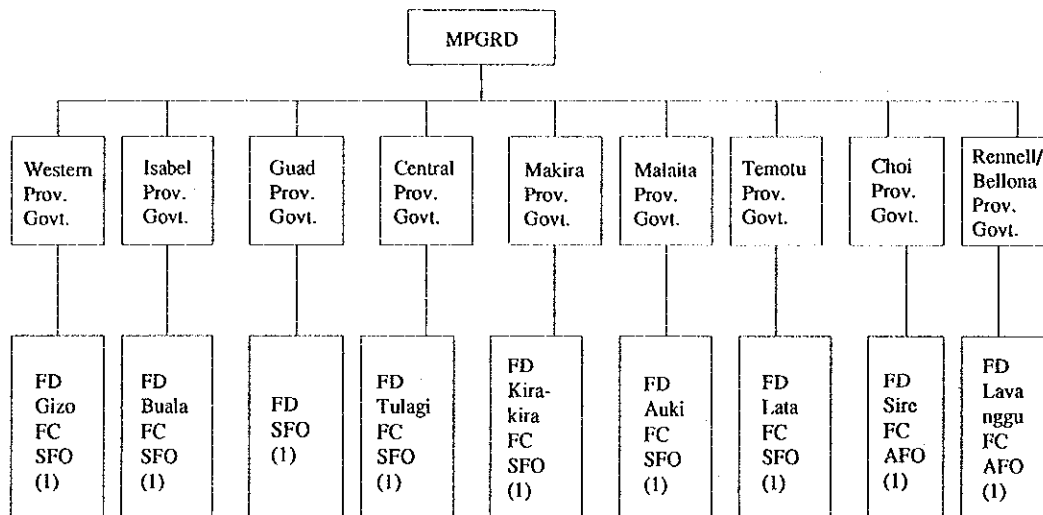
4) Depreciation : Replacement cost will be appropriated from savings.

5) Financing : Shortage in operational fund will be covered by DBSI loan. Grace period is three months and repayment period in nine months. Interest rate is 10 percent.



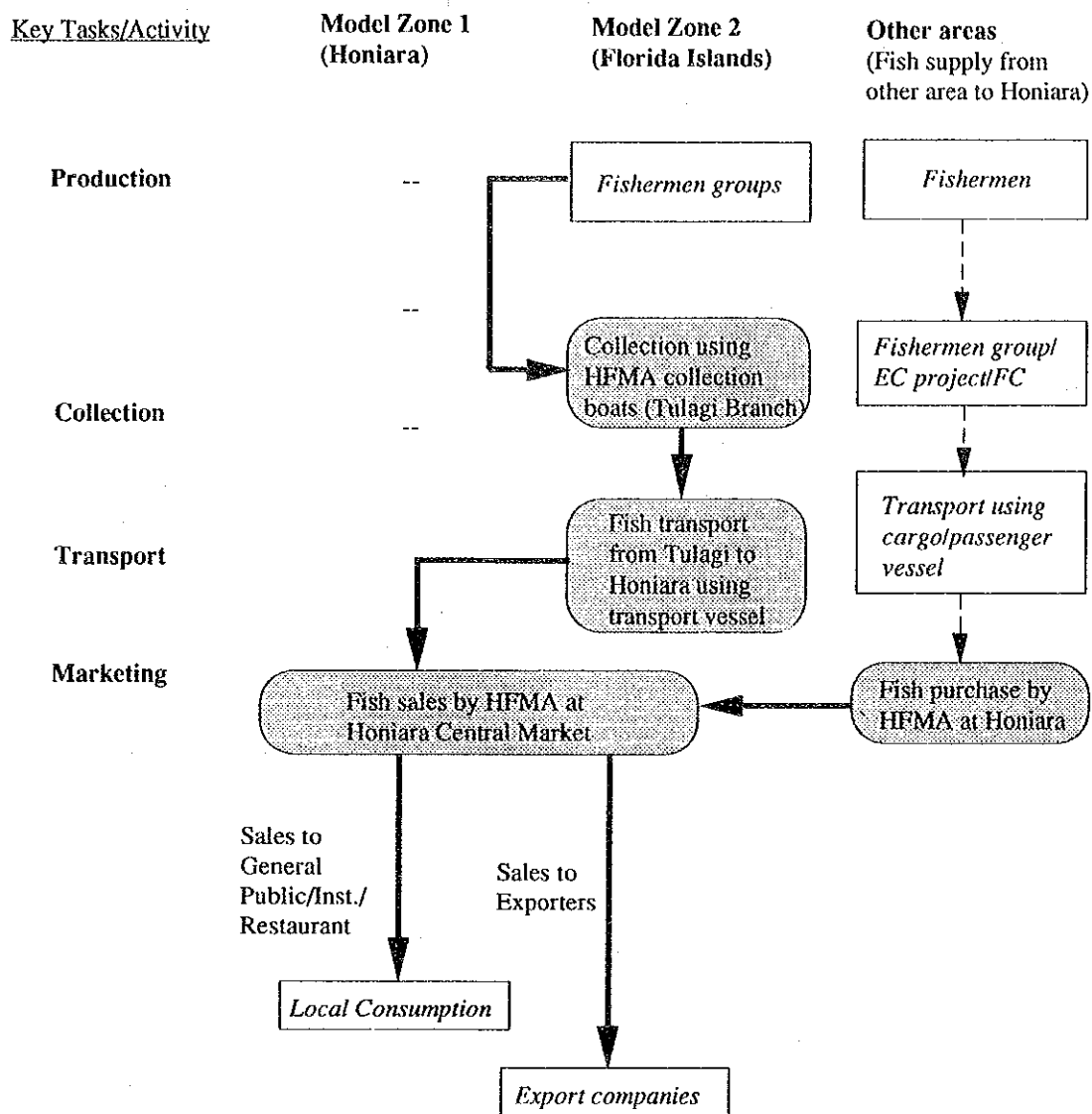
Remarks: 1) PFO; Principal Fisheries Officer
 2) SFO; Senior Fisheries Officer
 3) As of Feb 1994, MNR has been changed to Ministry of Agriculture and Fisheries.

Fig. IV.7.1 Organization Chart of Fisheries Division Under Ministry of Natural Resources.



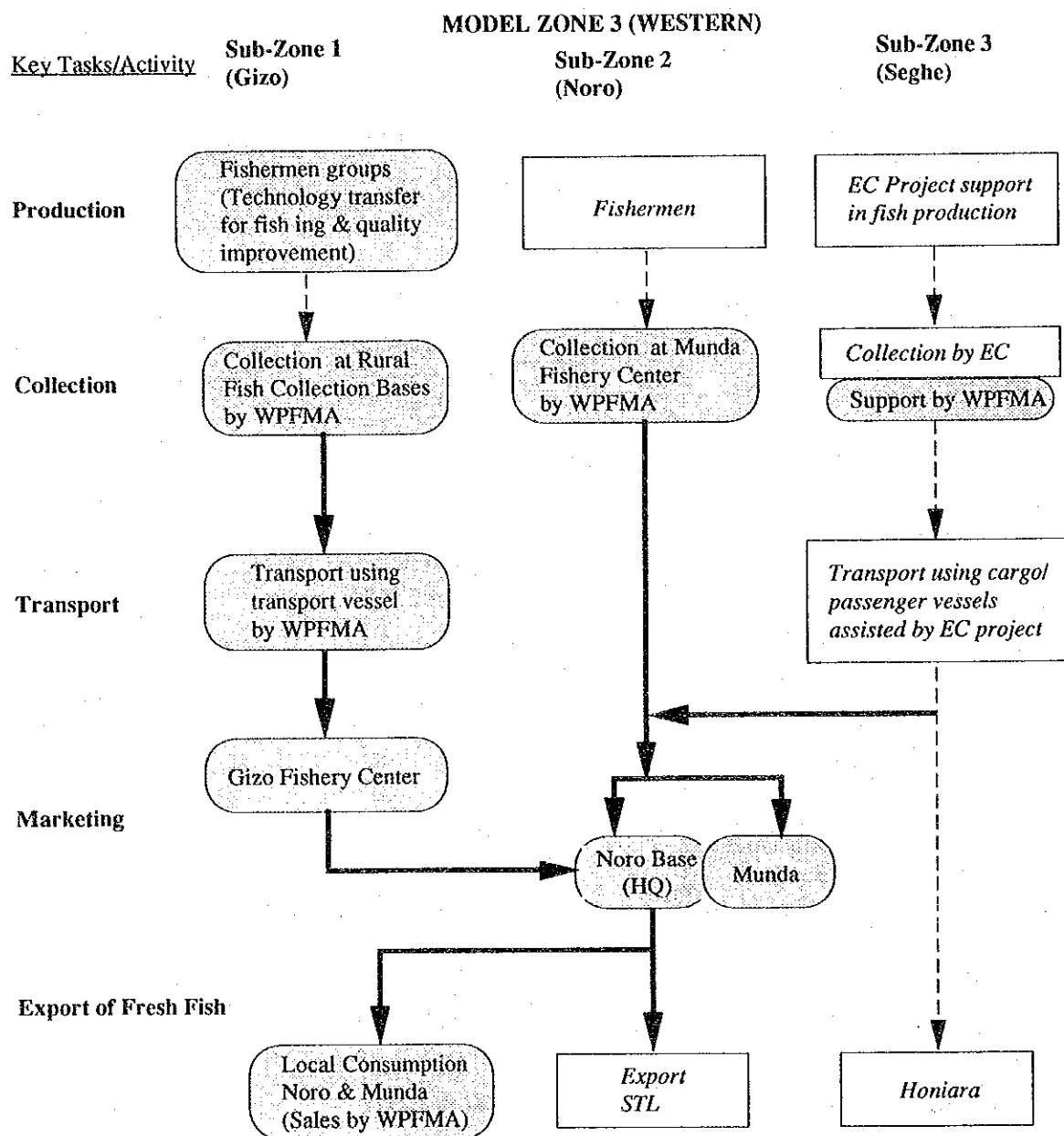
Remarks: 1) PG; Provincial government
 2) SFO; Senior Fisheries Officer
 3) AFO; Assistant Fisheries Officer
 4) MPGRD; Min. of Prov. Govt. and Regional Development
 5) Figures in parentheses show the existing number of staff.

Fig. IV.7.2 Organization Chart of Provincial FD and Existing Number of Staff, Members.



Remarks: 1) Shaded area and bold lines indicate activity by HFMA.
 2) HFMA will support in social/cultural events at Honiara Market Market.
 3) HFMA ; Honiara Fish Marketing Authority

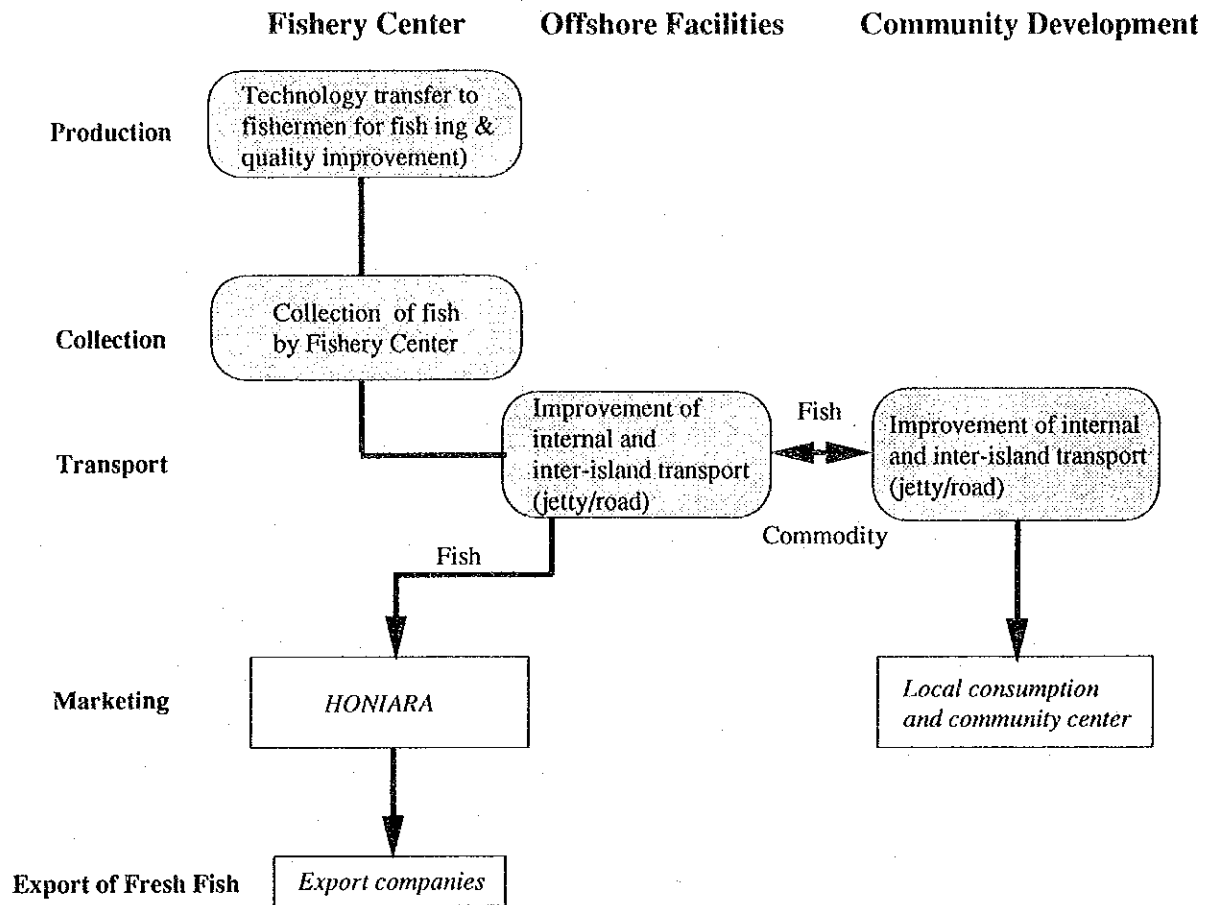
Fig. IV.7.3 Role/Activity of HFMA in Model Zone 1 and 2



Remarks: 1) Shaded area and bold lines indicate activity by WPFMA.
 2) HFMA will support in social/cultural events at Honiara Market Market.
 3) WPFMA; Western Province Fish Marketing Authority

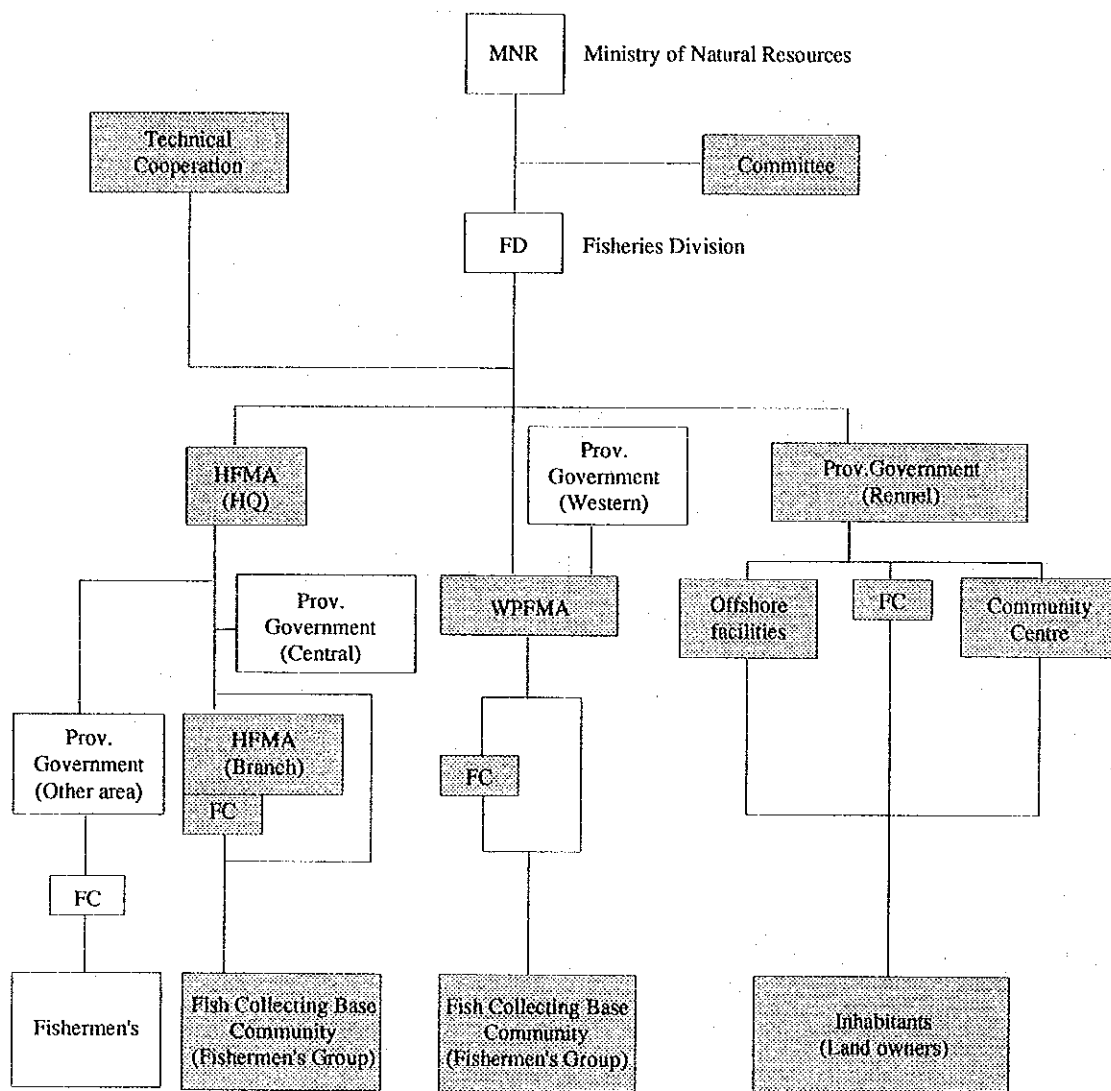
Fig. IV.7.4 Role/Activity of WPFMA in Model Zone 3

MODEL ZONE 4 (RENNELL ISLAND)



Remarks: 1) Shaded area and bold lines indicate the role of provincial government.
 2) Improvement of internal & inter-island transport is expected to promote tourism, and to offer accessibility to flow of fish to Honiara.

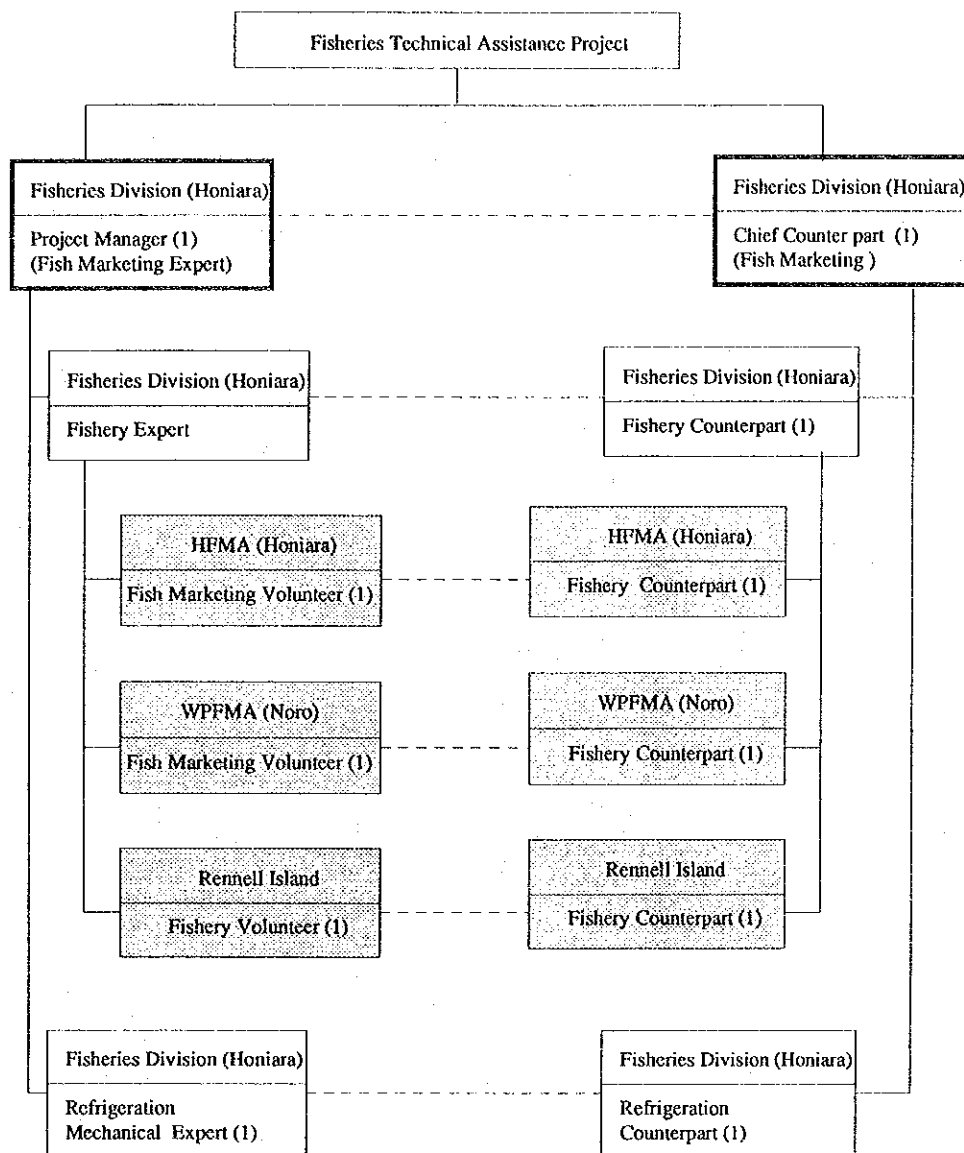
Fig. IV.7.5 Role/Activity of Prov. Gov. in Model Zone4



Remarks

- (1) HFMA : Honiara Fish Marketing Authority
- (2) WPFMA : Western province Fish Marketing Authority
- (3) FC : Fisheries Center
- (4) Shaded : Shaded areas are proposed organization for the project.

Fig. IV.7.6 Proposed Chart of the Public Corporation and Provincial Government for Improvement of Fish Marketing System



Remarks:

- : Volunteers/counterparts based in respective project areas.
- : Experts/counterparts based at Fisheries Division in Honiara.
- : Box in bold lines indicates the requirement of expert/counterpart during the preparation stage.

Fig. IV.7.7 Organization for Proposed Technical Assistance

Table IV.7.1 Proposed Procedure for Stagewise Institutional Building

		1st Stage	2nd Stage	Final Stage
		1995	2000	2010
Model Zone 1&2				
(1) Honiara Central Market Fisheries Related Facilities (HFMA - HQ)	O	Honiara Town Council	HTC	HTC
	M	FD and/or HFMA (Wholesaler & Retailer)	HFMA (wholesaler) HFMA (Retailing) Retailer	HFMA Wholesaler Retailer
(2) Tulagi Base (HFMA branch)	O	FD/HFMA	Prov. Govt.	Prov. Govt.
	M	HFMA	HFMA Prov. Govt.	Prov. Govt.
(3) Fish Collection Base (HFMA Satellite)	O	FD/HFMA	FD/HFMA	FD/HFMA
	M	(Community) Fishermen	(Community) Fishermen	(Community) Fishermen

O : Ownership M : Management

		1st Stage	2nd Stage	Final Stage
Model Zone 3				
Sub-Zone 2 (Noro) (WPFMA-HQ)	O	FD	Prov. Govt.	Prov. Govt.
	M	Prov. Govt. and / or WPFMA	WPFMA	WPFMA
Sub-Zone 1 (Gizo) (WPFMA-Branch)	O	FD	Prov. Govt.	Prov. Govt.
	M	Prov. Govt. and / or WPFMA	WPFMA	WPFMA
Sub-Zone 3 (Seghe) (WPFMA-Branch)	O	FD	Prov. Govt.	Prov. Govt.
	M	Prov. Govt. and / or WPFMA	EEC-FC	FC
Sub-Zone 1 Fish Collection Base (WPFMA Satellite)	O	Prov. Govt. and/or WPFMA	Prov. Govt. and/or WPFMA	Prov. Govt. and/or WPFMA
	M	(Community) Fishermen	(Community) Fishermen	(Community) Fishermen

O : Ownership M : Management

		1st Stage	2nd Stage	Final Stage
Model Zone 4				
(1) Off-shore facilities	O	Prov. Govt.	Prov. Govt.	Prov. Govt.
	M	Prov. Gov. Supported by FD/Port Authority	Prov. Gov. Supported by FD/Port Authority	Prov. Gov. Supported by FD/Port Authority
(2) Fisheries Development	O	Prov. Govt.	Prov. Govt.	Prov. Govt.
	M	Supported by FD	Supported by FD	Supported by FD
(3) Community Development	O	Prov. Govt.	Prov. Govt.	Prov. Govt.
	M	Prov. Gov. / Community (Inhabitants Coop)	Prov. Gov. / Community (Inhabitants Coop)	Prov. Gov. / Community (Inhabitants Coop)

O : Ownership M : Management

Remarks: 1) HFMA; Honiara Fish Marketing Authority, 2) WPFMA; Western Province Fish Marketing Authority;
 3) FD; Fisheries Division (MNR); 4) HTC; Honiara Town Council
 5) Fish marketing is related only to fresh fish.

Table IV.7.2 Quarterly Income Statement and Cash Flow of the HFMA Project in the First Year

Unit: SI\$					
	Q'ty (MT)	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
I. Income Statement					
A. Revenue		\$343,119	\$1,029,357	\$686,238	\$686,238
1) Fish sales	90	\$342,000	\$684,000	\$684,000	\$684,000
2) Ice		\$1,119	\$2,238	\$2,238	\$2,238
3) Revenue from 1st. Quarter			\$343,119		
B. Expense		\$530,664	\$530,664	\$530,664	\$530,664
Fixed					
1) Utility		\$12,720	\$12,720	\$12,720	\$12,720
2) Maintenance		\$14,655	\$14,655	\$14,655	\$14,655
3) Salary/wages		\$6,600	\$6,600	\$6,600	\$6,600
4) Gen. expense (20%)		\$1,320	\$1,320	\$1,320	\$1,320
Variable					
1) Salary/wages		\$6,000	\$6,000	\$6,000	\$6,000
2) Fish purchase cost		\$450,000	\$450,000	\$450,000	\$450,000
Depreciation		\$39,369	\$39,369	\$39,369	\$39,369
C. Income before D & I		(\$148,176)	\$538,062	\$194,943	\$194,943
D. Net Income		(\$187,545)	\$498,693	\$155,574	\$155,574
II. A. Sources of Funds					
1) Loan		\$187,545	\$0	\$0	\$0
2) Depreciation		\$39,369	\$39,369	\$39,369	\$39,369
3) Net income		(\$187,545)	\$498,693	\$155,574	\$155,574
B. Uses of Funds		\$4,670	\$65,138	\$65,138	\$65,138
Repayment incl. interest		\$4,670	\$65,138	\$65,138	\$65,138
C. Net cash flow		\$34,699	\$472,924	\$129,805	\$129,805

Remarks: 1) Assumption that revenue is about 50 percent of total sales in the first quarter and thereafter total revenue is collected.

2) Interest is 10 percent.

3) Loan to be repaid in in 9 months with 3 months grace period.

4) Purchase price of fresh fish from fishermen is SI\$5.00/kg in Honiara.

5) Sale price of grade-A is SI\$8.00/kg and grade-B is SI\$7.50/kg.

8. CONCLUSION AND RECOMMENDATION

(1) Present conditions in fish marketing system

- 1) Due to the lack of private fish traders in the Solomon Islands, fishermen are required to transport their fish catch directly to the consumption areas or are dependent on the Fisheries Centers or foreign assistance agencies which are indirectly involved in fish marketing activities.
- 2) Although Fishery Centers have been set up at major rural fish landing sites, their functions have remained largely under developed due to the lack of a fish marketing and transport information network linking the production to the consumption areas.
- 3) Fish marketing and transport operations have been unable to achieve their maximum potential due to a shortage of personnel, operational fund, and managerial ability.

(2) Factors concerning implementation of development plans to improve fish marketing system

The following factors should be taken into consideration when implementing improvement measures in the fish marketing network.

1) Stage wise development

- a. Mutual understanding and a general consensus should be reached among fishermen and other related personnel prior to implementation of development measures.
- b. The scope of the Project should be to keep in pace with the economic growth of the nation and its objectives should be to achieve continuous operations and gradual participation of the private sector.
- c. The existing fish marketing facilities and their related infrastructure should be utilized to their maximum capacity.
- d. In developing the remote islands of the nation, an integrated marketing network of fish and other commodities should be targeted and a model for development of under-developed islands should be established.

2) Institutional arrangement

A "Committee to improve fish marketing/transport" under MNR should be established to regulate the following points before the completion of the facilities.

- a. To form the laws and institution
- b. To establish the public corporation

3) Foreign assistance

Before project operations are fully underway, it is necessary to invite foreign experts to the Solomon Islands and to send core management staff who will be in charge of future project operations, abroad to receive technical training. Technical transfer will be conducted in the field of fish marketing, fishing operation and mechanical engineering. Since measures to set up organization and system are not just matters of simple technical transfer, it will be necessary to consider the project as a "packaged" arrangement of despatching of experts, training in foreign countries and equipment supply.

4) Survey on fish resource management

This study has been limited to a survey of the fish marketing system, and improvements in the environment relevant to fish production have not been studied. However, resource management measures are clearly required for some fish species. A survey to improve fish resource management is recommended.

(3) Supplementary surveys during implementation of projects in model areas

This is a pre-feasibility study and project formulation has been based on a short-term field survey. Subsequently, a more detail study is required in order to determine project scope, cost estimations, etc.. Detailed survey work is recommended in the following areas when the project is implemented in the model areas.

1) Model Zone 1 (Honiara)

- a. Market survey: Further study on the Central, Rove, and Kukum markets and in particular, the flow of all commodities throughout the year.
- b. Survey of market management and operations: Deliberations to consolidate a system of general market operations of the Central Market, by the Honiara Town Council and pertinent agencies.
- c. Survey of natural conditions: Although a soil test has already been carried out in the coastal area, a boring survey should be implemented at several sites within the market area.

2) Model Zone 2 (Florida Islands)

- a. Trial operation: Trial operation of fish collection and transport activities should be implemented using the vessel, Daula, owned by the Fisheries Division. Project implementation should proceed based on the results of this trial operation.
- b. Survey of natural conditions: Further surveys on the weather, sea, and soil conditions of the project site in Tulagi should be carried out prior to project implementation. although the surrounding sea is relatively moderate.

3) Model Zone 3 (Western Province)

Trial operation: Trial operation of fish collection and transport activities should be implemented using the vessel, Kuarao, owned by the provincial government. Project implementation should proceed based on the results of this trial operation.

4) Model Zone 4 (Rennell Island)

The following surveys are recommended to improve cargo landing functions of Kanggava Bay.

- a. A consensus of inhabitants engaged in fishing operations in Kanggava Bay.
- b. Survey of natural conditions
 - A survey of the sea conditions of Kanggava Bay during rough weather.
 - A detailed survey of coral reef conditions for wharf construction.
 - A boring test confirming ground support conditions.
- c. Survey on transport/supplies

A detailed study of transport means, since shipment of materials is difficult.

ANNEX

Annex - 1 Personnel

(A) Government of Japan

(1) Advisory Committee Members

1) Chairman	Michimasa OGUSHI	Director, Cooperation Promotion Department, Overseas Fishery Cooperation Foundation
2) Member	Tsunero KOKUBU	Deputy, Section Chief, International Cooperation Dept. Fisheries Agency, Ministry of Agriculture, Forestry and Fisheries
3) Member	Toru KUMATANI	Deputy, Section Chief, International Cooperation Dept. Fisheries Agency, Ministry of Agriculture, Forestry and Fisheries
4) Member	Yasushi NAKAZATO	Section Chief, International Affairs Division, Oceanic Fishery Department, Fisheries Agency, Ministry of Agriculture, Forestry and Fisheries

(2) Study Team Members

1) Team Leader	Tateo KUSANO (System Science Consultants Inc.)
2) Deputy Team Leader	Teruo YABANA (System Science Consultants Inc.)
3) Fish Marketing	I. ALLAHPICHAY (System Science Consultants Inc.)
4) Fish Production	Tamio AKAOKA (System Science Consultants Inc.)
5) Fishing Community	Takashi MORIMOTO (System Science Consultants Inc.)
6) Project Economy	John M. FLOYD (Development Alternatives Inc., USA)
7) Facilities/Infrastructure	Mikio TANAKA (System Science Consultants Inc.)
8) Architectural Planning	Masahiko WATANABE (System Science Consultants Inc.)
9) Environment	Eng Guan TAN (System Science Consultants Inc.)
10) Liaison	Hideto YASUI (System Science Consultants Inc.)

(B) Government of Solomon Islands


1) Mostyn Habu	Permanent Secretary	Ministry of Natural Resources
2) James Saliga	Permanent Secretary	Ministry of Natural Resources
3) Alberta Wata	Director of Fisheries	Fisheries Division (MNR)
4) George Poape	Principal Fisheries Officer	Fisheries Division (MNR)
4) Kitchener Collinson	Senior Fisheries Officer	Fisheries Division (MNR)
5) Fred Fakarii	Chief of Asian Section	Ministry of Foreign Affairs

Annex - 2 Scope of Work

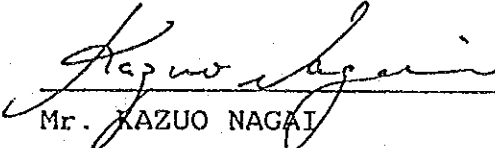
SCOPE OF WORK
FOR
THE DEVELOPMENT STUDY
ON
IMPROVEMENT OF NATIONWIDE FISH MARKETING SYSTEM
IN
SOLOMON ISLANDS

AGREED UPON BETWEEN
MINISTRY OF NATURAL RESOURCES
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

Honiara, February 8, 1993



Mr. MOSTYN HABU
PERMANENT SECRETARY,
MINISTRY OF NATURAL RESOURCES



Mr. KAZUO NAGAI
LEADER,
PREPARATORY STUDY TEAM,
JAPAN INTERNATIONAL
COOPERATION AGENCY.

I. INTRODUCTION

In response to the request of the Government of Solomon Islands, the Government of Japan has decided to conduct the Development Study on Improvement of Nationwide Fish Marketing System (hereinafter referred to as "the Study"), in accordance with the relevant laws and regulations in force in Japan.

Accordingly, the Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programmes of the Government of Japan, will undertake the Study in close cooperation with the authorities concerned of Solomon Islands.

The present document sets forth the scope of work with regard to the Study.

II. OBJECTIVE OF THE STUDY

The objectives of the Study are to provide alternative plans for achieving an efficient Fish Marketing System and thereby upgrading returns to small scale fishermen and stabilizing fish supply to urban areas, and to conduct pre-feasibility studies on the selected projects.

III. STUDY AREA

The study area shall cover the whole of Solomon Islands.

IV. OUTLINE OF THE STUDY

1. The Study consists of the following two (2) phases.

(Phase I) Comprehensive study on socio-economic conditions, current fisheries, previous projects on fish marketing and the existing Fish Marketing System will be conducted in the study area and a nationwide fish marketing development master plan will be prepared.

(Phase II) Based on the results of Phase I, pre-feasibility

M.H.I.

[Signature]

study will be conducted for some priority projects.

2. The detailed scope of the work at the respective phases are itemized as follows:

(1) Phase I

1) Collection of data and information on:

- a. Socio-economic conditions,
- b. Existing policy and regulations concerned with the Study,
 - Socio-economic development plan
 - Environmental regulations
 - Others
- c. Present fisheries,
 - Artesanal fisheries
 - Industrial fisheries
- d. Local and domestic demand and supply of fishes,
- e. Existing fish marketing system,
 - Fish marketing in Honiara
 - Provincial fisheries centers and sub-centers
 - Others
- f. Past projects and studies related to fish marketing system,
- g. Existing inter-island transportation system.

2) Field survey on the items mentioned in 1).

3) Preparation of a nationwide fish marketing development master plan including:

- a. Review of fish marketing system,
- b. Strategy for improving fish marketing system,
- c. Alternative plans to improve fish marketing system,
- d. Others.

4) Listing of the candidate projects for pre-feasibility study.

(2) Phase II

- 1) Determination of the priority projects.
- 2) Supplemental survey on the items mentioned in (1)-(1).
- 3) Formulation of the priority projects including:
 - a. Improvement and/or development plan for fish marketing infrastructure and facilities,
 - b. Preliminary design of major infrastructures and facilities,
 - c. Basic plan of the organization and the institution,
 - d. Operation, maintenance and management plan of the project,
 - e. Others.
- 4) Estimation of cost and benefit of projects,
- 5) Initial environmental examination (IEE),
- 6) Project evaluation,
- 7) Recommendations.

V. STUDY SCHEDULE

The Study will be carried out in accordance with the attached tentative work schedule.

VI. REPORTS

JICA shall prepare and submit the following reports in English to the Government of Solomon Islands.

(1) Inception Report

Twenty (20) copies at the commencement of Phase I Study.

(2) Interim Report

Twenty (20) copies at the commencement of Phase II Study.

(3) Draft Final Report

Twenty (20) copies at the end of works in Japan of Phase II.

The Government of Solomon Islands provides JICA with its comments on the Draft Final Report through the Embassy of Japan within one (1) month after receipt of the Draft Final Report.

(4) Final Report

Fifty (50) copies within two (2) months after the receipt of the comments from the Government of Solomon Islands on the Draft Final Report.

VII. UNDERTAKING OF THE GOVERNMENT OF SOLOMON ISLANDS

1. To facilitate smooth conduct of the Study, the Government of Solomon Islands shall take necessary measures;

- (1) to secure the safety of the Study team,
- (2) to permit the members of the Study team to enter, leave and sojourn in Solomon Islands for the duration of their assignment therein, and exempt them from foreign registration requirements and consular fees,
- (3) to exempt the members of the Study team from taxes, duties and other charges on equipment, machinery and other materials brought into Solomon Islands for the conduct of the Study,
- (4) to exempt the members of the Study team from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the Study team for their services in connection with the implementation of the Study,
- (5) to provide necessary facilities to the Study Team for remittance as well as utilization of the funds introduced into Solomon Islands from Japan in connection with the implementation of the Study,
- (6) to secure permission for entry into private properties or restricted areas for the implementation of the Study,
- (7) to secure permission for the Study team to take all data and documents (including maps, photographs) related to the Study out of Solomon Islands to Japan,
- (8) to provide medical services as needed. Its expenses will be chargeable on members of the Study team.

2. The Government of Solomon Islands shall bear claims, if any arises, against the members of the Study team resulting

from, occurring in the course of, or otherwise connected with, the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the members of the Study team.

3. Ministry of Natural Resources (hereinafter referred to as "MNR") shall act as counterpart agency to the Study team and also as coordinating body in relation with other governmental and non-governmental organizations concerned for the smooth implementation of the Study.
4. MNR shall, at its own expence, provide the Study team with the following, in cooperation with other organizations concerned;
 - (1) available data and information related to the Study,
 - (2) counterpart personnel,
 - (3) suitable office space with necessary equipment in Honiara.
 - (4) credentials or identification cards,
 - (5) adequate means of local transport for official travel.

VIII. UNDERTAKING OF JICA

For the implementation of the Study, JICA shall take the following measures;

- (1) to dispatch, at its own expense, study teams to Solomon Islands,
- (2) to pursue technology transfer to the Solomon Islands counterpart personnel in the course of the Study.

IX. CONSULTATION

JICA and MNR shall consult with each other in respect of any matter that may arise from or in connection with the Study.

ANNEX

TENTATIVE STUDY SCHEDULE

Description	Month														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
(Phase I) 1. Work in Solomon 2. Work in Japan	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
(Phase II) 1. Work in Solomon 2. Work in Japan 3. Explanation of DF/R 4. Preparation of F/R	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Report	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
	IC/R	IT/R	DF/R	F/R											

Note: IC/R: Inception Report IT/R: Interim Report
DF/R: Draft Final Report F/R: Final Report

MINUTES OF MEETING
ON
SCOPE OF WORK
FOR
THE DEVELOPMENT STUDY
ON
IMPROVEMENT OF NATIONWIDE FISH MARKETING SYSTEM
IN
SOLOMON ISLANDS

AGREED UPON
BETWEEN
MINISTRY OF NATURAL RESOURCES
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

The Japanese Preparatory Study Team, headed by Mr Kazuo Nagai, visited Solomon Islands for the purpose of discussing the Scope of Work for the Development Study on Improvement of Nationwide Fish Marketing System from January 27 to February 9, 1993.

The team had a series of discussions with MNR to exchange views and opinions on the Study, and conducted field surveys in Solomon Islands.

Following the discussions, both sides have agreed on the following points, in addition to the Agreement on the Scope of Work.

1. As the coordinating body of the study, MNR will facilitate exchange of views and discussions with other donor agencies (governments) implementing similar or related assistance with the Study as necessary.
2. MNR stressed the difficulty in assigning a counterpart for each member of the Study team due to limitation in the number of personnel in the Fisheries Division.

MNR shall undertake its best efforts to assign counterparts to the Study team where possible, including fisheries officers in the Provinces.

3. To facilitate the entry of the Study team and to carry out its work in Solomon Islands, JICA undertakes to provide to MNR the necessary information regarding team members, for clearnace with the relevant Government authorities in Solomon Islands. The information shall include the biodata and the passport numbers of each person and any equipment brought into Solomon Islands to carry out their work.

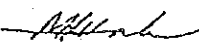
4. MNR clarified to JICA that there is no need for credential or identification cards for the Study team members while they are in Solomon Islands as their passports will serve that purpose.

5. Regarding the provision of a means of transport for the Study team in Solomon Islands, MNR expressed difficulty in providing vehicles due to limitations in the number of vehicles available to the Fisheries Division. MNR shall make arrangements with Provincial Fisheries Divisions to provide boats for the Study team but fuel shall be met by the Study team.

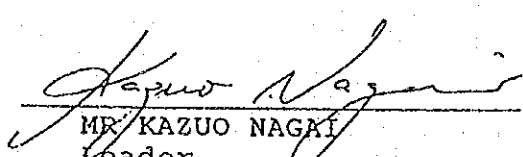
6. The Fisheries Division shall provide an office space for the Study team but charges for overseas telephone calls, facsimile and telexes shall be met by the Study team.

7. JICA is requested to accept local counterparts to the Study for training in Japan under JICA's Trainee Acceptance Programme.

Honiara, February 8 1993



MR MOSTYN HABU
Permanent Secretary
Ministry of Natural Resources
Solomon Islands Government



MR KAZUO NAGAI
Leader
Preparatory Study Team
JICA

MINUTES OF THE MEETING
ON THE INCEPTION REPORT OF THE DEVELOPMENT STUDY
ON IMPROVEMENT OF NATIONWIDE FISH MARKETING SYSTEM
IN SOLOMON ISLANDS

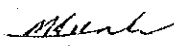
In pursuance to the objective of the Implementing Arrangement between Ministry of Natural Resources (hereinafter referred to as "MNR") and the Japan International Cooperation Agency (hereinafter referred to as "JICA") for the Development Study on Improvement of Nationwide Fish Marketing System in Solomon Islands (hereinafter referred to as "the Study") signed on February 8, 1993, JICA dispatched the Study Team headed by Mr. Tateo KUSANO and the Advisory Team headed by Mr. Toru KUMATANI from April 10, 1993 to May 15, 1993 and from April 10, 1993 to April 19, 1993, respectively.

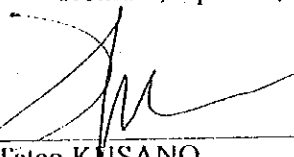
The JICA Study Team submitted 20 copies of the Inception Report to Solomon Islands side and held a series of discussions with the Solomon Islands authorities and counterparts headed by Mr. Mostyn Habu, Permanent Secretary, MNR.

The salient results of the discussions are as follows:

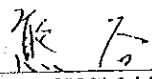
1. Solomon Islands side has agreed in principle upon the contents of the Inception Report, and that of the notes of discussions which is hereto attached.
2. Both sides agreed to cooperate with each other for the efficient conduct of the study so that its objectives would be attained as described in the Inception Report.

Honiara, April 16, 1993


Mr. Mostyn HABU
Permanent Secretary
MNR


Mr. Tateo KUSANO
Leader of Study Team
JICA

Witnessed by


Mr. Toru KUMATANI
Leader of Advisory Team
JICA

ATTACHMENT TO THE MINUTES OF MEETING
ON THE INCEPTION REPORT OF THE DEVELOPMENT STUDY
ON IMPROVEMENT OF NATIONWIDE FISH MARKETING SYSTEM
IN SOLOMON ISLANDS

1. The Solomon Islands side agreed to allow the Study Team to use the Fisheries Division Office in the MNR in order to implement the Study smoothly.
2. The Solomon Islands side agreed to secure permission for entry into private properties or restricted area for the implementation of the Study.
3. The Solomon Islands side agreed to secure permission for the Study Team to take all data and documents (including maps, photographs) related to the Study out of Solomon Islands to Japan.
4. The Solomon Islands side agreed to exempt the members of the Study Team from taxes, duties and other charges on equipment, machinery and other materials brought into Solomon Islands for the conduct of the Study.
5. The Solomon Islands side has agreed to make arrangements with Provincial Fisheries Divisions to provide boats for the Study Team but the cost of fuel shall be met by the Study Team.
6. The Study Team has requested MNR to make necessary arrangement of visa for members of the Study Team.

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MINUTES OF THE MEETING
ON THE INTERIM REPORT OF THE DEVELOPMENT STUDY
ON IMPROVEMENT OF NATIONWIDE FISH MARKETING SYSTEM
IN SOLOMON ISLANDS

In pursuance to the Interim Report of the Development Study on Improvement of Nationwide Fish Marketing System in Solomon Islands (hereinafter referred to as "the Study"), the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Study Team headed by Mr. Tateo KUSANO and the Advisory Team headed by Mr. Michimasa OGUSHI from Sept. 18-25, 1993 .

The JICA Study Team submitted 20 copies of the Interim Report to Solomon Islands side and held a series of discussions with the Solomon Islands authorities and counterparts headed by Mr. Albert WATA, Director of Fisheries, Fisheries Division, Ministry of Natural Resources (MNR).

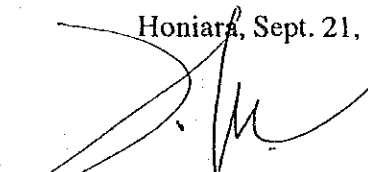
The salient results of the discussions are as follows:

1. Solomon Islands side has agreed in principle upon the contents of the Interim Report.
2. Both sides agreed to cooperate with each other for the efficient conduct of Phase II of the study so that its objectives would be attained as described in the Inception Report.



Rt. Hon. Ezekiel ALEBUA
Minister
MNR

Honiara, Sept. 21, 1993



Mr. Tateo KUSANO
Leader of Study Team
JICA

Witnessed by



Mr. Michimasa OGUSHI
Leader of Advisory Team
JICA

MINUTES OF THE MEETING
ON THE DRAFT FINAL REPORT OF THE DEVELOPMENT STUDY
ON IMPROVEMENT OF NATIONWIDE FISH MARKETING SYSTEM
IN SOLOMON ISLANDS


In pursuance to the Draft Final Report of the Development Study on Improvement of Nationwide Fish Marketing System in Solomon Islands (hereinafter referred to as "the Study"), the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Study Team headed by Mr. Tateo KUSANO and the Advisory Team headed by Mr. Yasushi NAKAZATO from Jan. 26 - Feb.5, 1994.

The JICA Study Team submitted 20 copies of the Draft Final Report to Solomon Islands side and held a series of discussions with the Solomon Islands authorities and counterparts headed by Mr. Albert WATA, Director of Fisheries, Fisheries Division, Ministry of Natural Resources (MNR).

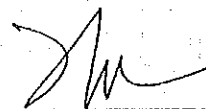
The salient results of the discussions are as follows:

1. Solomon Islands side has agreed in principle upon the contents of the Draft Final report, and that the recommendations are acceptable.
2. The Government of Solomon Islands will convey to the Study Team its comments on the Draft Final Report by March 3, 1994. Fifty (50) copies of the Final report within two (2) months after receiving the comments on the Draft Final Report will be submitted to the Government of Solomon Islands

Honiara, Feb. 3, 1994

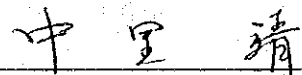


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Annex - 7 Consumption/Market Survey

1. Objective

The objectives of this survey were to grasp the socio-economic profile, the current consumption pattern in fish products, frequency of fish consumption, money spent on fish purchase, and condition of fish marketing/distribution, etc.

2. Study Approach

(1) Sampling method and survey period

Sampling method and number of samples is given in Table A-7.1. The survey period covered about 20 days including the training of chief coordinator and enumerators in Honiara and respective provinces. The enumerators were locally recruited and have had previous experience in this type of survey.

(2) Questionnaires

Three sets of questionnaire were prepared covering (a) fish consumption survey, (b) market survey of Honiara Central Market, Rove Market and Kukum Market, (c) institutional survey (hospital, hostels, school dormitory, prison, hotels), and (d) market survey of Honiara Central Market for agricultural produce. Some of the major items in the questionnaire are listed below.

(A) Fish consumption survey

- Household characteristics
- Monthly income
- Monthly expenditure on food
- Food preference
- Frequency of fish consumption by type
- Quantity purchase each time
- Fish quality

(B) Market survey

- Number of esky and quantity (fish)
- Origin of esky
- Quantity of sold
- Type of agricultural produce
- Quantity of produce traded (weekday and weekend)
- Origin of produce

3. Analysis

3.1 Fish Consumption Survey

(1) Socio-economic Aspects

The number of households, according to the population census in 1986, were 4765 in Honiara, 590 in Gizo, 487 in Auki, 333 in Buala and 385 in Kirakira. The total number of households covered in the consumption survey were three percent (185) of the total 6,560 households. Some 125 households (3 percent) in Honiara, 20 households each in Auki (Malaita) and Gizo (Western), and 10 households each in Kirakira (Makira) and Buala (Isabel) were covered.

(2) Household size

The distribution of households, according to different size classification is shown in Table A-7.2. Households with 4-6 members are 26 percent in Honiara, 52 percent in Gizo, 36 percent in Auki, 20 percent in Kirakira and 40 percent in Buala; while the proportion with six or more members was 67 percent in Honiara, 36 percent in Gizo, 48 percent in Auki, 50 percent in Kirakira and 40 percent in Buala. The average size of all households in Solomon Islands, according to the Population Census in 1986, was estimated at 6.5 members per household.

(3) Occupation of household head and number of income earners in household

In Honiara 40 percent of the respondents were government employee, 29 percent private company employees, 18 percent self employed, and 7 percent professionals; while in the provincial capitals, government employee were 52 percent in Gizo, 84 percent in Auki, 78 percent in Buala and 12 percent in Kirakira (Table A-7.3).

Income earner refers to a working member of the household. In Honiara (Table A-7.4), of 125 households surveyed, 30 percent indicated one income earning member, 46 percent two income earning members and 14 percent three income earning members, and the rest had 4 or 5 income earners. In Gizo 48 percent had one-income earner, 36 percent two-income earners and the rest had three or five income earners in the house. In Auki, Kirakira and Buala 76-80 percent had one income earning member, and the rest were two income earners. Most of regular working members in the provincial urban areas are government servants and in Honiara, there are both government servants and private company employees.

(4) Monthly household income and expenditure on food

An examination of the household monthly income is shown in Table A-7.5. In Honiara, 19 percent earn less than SISI\$750 a month, 18 percent earn between SI\$750-1000, 22 percent earned SI\$1000-1500, 16 percent earned SI\$1500-2000 and 17 percent earned SI\$2000-4000; while about 9 percent earn more than SI\$4000 a month. In the provinces incomes of less than SI\$750 were 36 percent in Gizo, 52 percent in Auki and 40 percent in Kirakira and Buala. Those earning between SI\$750-1000 were 50 percent in Buala, 32 percent in Gizo, 24 percent in Auki and 10 percent in Kirakira. There were no respondents earning more than SISI\$4000.

With regard to monthly food expenditure (Table A-7.6), 55 percent of the respondents in Honiara spent SI\$100-300 a month, 52 percent in Gizo, 64 percent in Auki, 30 percent in Kirakira and 70 percent in Buala. Monthly expenditure in the category of SI\$300-450 were 16 percent in Honiara, 12 percent in Gizo, 16 percent in Auki, 40 percent in Kirakira and 10 percent in Buala. In Honiara and Gizo, 25-28 percent of spent more than SI\$450, and none in the other areas.

(5) Fish consumption

1) Preference

Most of the respondents in the survey preferred fish than chicken/meat (Table A-7.7). In Honiara 83 percent prefer fish, 88 percent in Gizo, 96 percent in Auki, and 100 percent in Kirakira and Buala. Those responded fish as a second preference were mainly in Honiara and Gizo. The reasons for preferring fish is shown in Table A-7.8. In the case of fresh fish, the reasons for first preference were "cheaper in price than chicken/meat", "like the taste" and "good for health". Some 32 percent in Honiara indicated "cheaper than chicken/meat", 22 percent "like the taste", 22 percent "good for health", 19 percent "quality is good" and "always available" by 5 percent. With regard to frozen fish which available only in Honiara, the main reason for preference was "always available" as shown by 45 percent of respondents, 28 percent "cheaper than fresh fish and chicken/meat". In case of canned fish, all the respondents indicated the consumption of canned fish. In Honiara 54 percent reported "can afford", 33 percent "always available", 10 percent "not messy when cooking" and the rest is due to taste. Some 90 percent in Gizo and Auki indicated availability as the reason for consumption, and 40 percent in Kirakira and Buala gave similar reasons.

The reasons for not preferring fish as first cited by respondents (Table A-7.9) who gave more than one reason, high price (33%), poor quality (27%), dislike

taste (20%) in case of fresh fish. With regard to frozen fish, all of the above respondents gave similar reasons.

2) Frequency of fish consumption in Honiara

The frequency of fish consumption by type, area and monthly income is shown in Tables A-7.10-a and A-7.10-b).

a) Fresh fish

Frequency of fresh fish consumption in relation to monthly income is shown in Table A-7.10-b. Some 41 percent consume fish twice a week, 32 percent once week and daily is about 5 percent. In relation to monthly income, some 35-40 percent in each category of income consume fresh fish once or twice a week.

b) Frozen fresh

With regard to frozen fish about 68 percent consume once week and about 18 percent indicated dislike for frozen fresh (Table A-7.10-b). In relation to income, 65-90 percent in each category consume frozen fish once a week.

c) Canned fish

Some 54 percent indicated daily consumption of canned fish, followed by 22 percent three/four times a week, 10 percent five or six times a week (Table A-7.10-a). High percentage of daily consumption are noticed in all the income groups ranging from 45-65 percent.

3) Frequency of fish consumption in the provinces

The frequency of fish consumption by type, area and monthly income is shown in Tables A-7.10-a for the provinces.

a) Fresh fish

In Gizo 40 percent consumed fresh fish three/four times a week followed 36 percent daily consumption. In Auki 56 percent consume three/four times a week and twice a week was 32 percent, and in Kirakira and Buala it was 70 percent consuming three/four times a week.

b) Canned fish

In terms of canned fish, the shares fluctuates according to places, in Gizo canned fish consumed three/four times were 40 percent, once a week was 28 percent and daily and twice a week was 16 percent each. Once a week and twice a week were high in Auki and Kirakira, 50-33 percent in Auki and 40-30

percent in Kirakira. In Buala daily consumption was 40 percent and consumption five/six times a week was 20 percent.

4) Money spent and quantity purchased each time

The money spent and quantity of fish purchase each time by the number of respondents in Honiara and in the provincial town areas are shown in Tables A-7.11-a/b to A-7.15-a/b.

a) Honiara

In Honiara more than 60 percent of the respondents indicated spending SISI\$12-20 for fish purchase each time. In terms of monthly income, those in the high income category tend to spend more money for fish purchase (Table A-7.11-b). In terms of quantity of fish purchased, the money spent was converted to fish weight equivalent using a retail price of about SISI\$6.00/kg. The quantity of fish consumed per meal per person increases with income, 340 g in an income category of less than SISI\$750 income to 414 g in more than SISI\$4000 income.

b) Provincial towns

In Gizo (Table A.6-12-a) 40 percent indicated SI\$5-10 for fish purchase and 48 percent spent SI\$10-12. The quantity of fish in a meal of one person (Table 1A-7.2-b) is about 200 g in SI\$750 income level and 275 g in higher income levels (SI\$2000-4000). In Auki about 64 percent (Table A-7.13-a) indicated a spending of SI\$5-10 and those spending SI\$10-12 were about 20 percent. The quantity of fish in a meal (Table 13-b) was 195 g in lower income levels and 232 g in high income levels (SI\$1500-2000). In Buala (Table A-7.14-a), 70 percent spend SI\$5-12 for fish purchase, and the quantity of fish consumed in a meal ranges from about 240 g to 350 g (Table A-6.14-b). In Kirakira (Table A-7.15-a), about 50 percent spend SI\$5-12 for fish and another 50 percent spends SI\$12-18. The amount of fish in their meal ranges from about 230 g to 450 g with income.

5) Purchase of canned fish

a) Honiara

In Honiara the response to the number of canned fish purchase by income category is shown in Table A-7.16. About 52 percent indicated a purchase two cans each time and about 20 percent indicated purchasing three or four cans. Those purchasing two cans at a time are relatively higher in all income

levels, and this reflects that higher income is not necessarily purchasing more number of cans.

b) Provincial towns

In Gizo (Table A-7.17), those purchasing two to three cans are about 88 percent, and in terms of income level the number of cans purchased increases with income level. In Auki (Table A-7.18) about 68 percent indicated purchasing two cans at a time, while in Buala (Table A-7.19), 70 percent indicated purchasing one can, and those purchasing two cans were 20 percent. In Kirakira (Table A-7.20), the percentage varies from 20 percent to 30 percent in relation to the number of cans purchased.

(6) Fish quality

The responses to the degree of fresh and frozen fish quality is shown in Table A-7.22. In Honiara, 66 percent indicated that fresh fish purchase is of good quality and 20 percent indicated excellent. In the provincial towns, 88 percent in Gizo, 68 percent in Auki, 30 percent in Kirakira and 40 percent in Buala indicated good quality. In terms of excellent quality 8 percent in Gizo, 24 percent in Auki, 30 percent in Kirakira and 50 percent in Buala. On the whole the quality of fresh fish available to consumers is good. In terms of frozen fish, which are only available to consumers in Honiara, 54 percent indicated fair quality and 29 percent good, and 16 percent poor quality.

3.2 Market survey

Market survey-1 of Honiara Central Market, and Rove Market was conducted using enumerators for about 20 days from June 21 to July 12, 1993 (Tables A-7.23 & A-7.24). The purpose of this survey was to count the number of eskies, particularly for fresh fish (reef and pelagic), and its origin as well as to estimate the quantity of fresh fish. The market was visited in the morning and evening. The weather during the survey was not good; it was rainy and the seas were rough. As a result, the landings or the number of eskies brought to Honiara were less than expected. Market survey-2 was conducted during phase 2 for 30 days from September 27 to October 30, 1993.

(1) Central Market

The Honiara Central Market is normally closed on Sundays and national holidays. During the Market survey-1, the Honiara Central market was opened for only 19 days, and the eskies of fresh fish were seen only for 16 days. During these 16 days, 65 eskies were noted with an estimated quantity of 3,690 kg of fish. Of these 65 eskies, 49 eskies

(75percent) were from Florida Islands (Gela), 7 eskies (11%) from Isabel, and the remaining 9 eskies (14%) were from Central (Russels), Guadalcanal (Marau and Lambi). On an average, there were 4 eskies a day with an estimate of 230 kg of fresh fish, besides the eskies of frozen fish, on an average about 25 eskies. During market survey-2, the weather was fairly good and there were a considerable number of eskies daily. A total of 466 eskies of fresh fish were counted at the Honiara Central Market. The total quantity of fresh fish traded during the 30-day period was 36.2 MT which amounted to an average of 1.2 MT a day. By way of origin about 77 percent was from Central Province (mainly Florida Islands), 12 percent from Isabel, 8 percent from Guadalcanal and 3 percent from Malaita provinces.

(2) Rove market

The Rove market is normally open on Sundays except on national holidays. During the survey period, eskies of fresh fish were seen only 12 days, and 26 eskies were recorded with an estimate of 1,540 kg of fish. Of these 26 eskies, 11 eskies (42 percent) were from Russels (Central Province), 10 eskies (38 percent) from Florida Islands (Central Province), and the remaining 5 eskies (20 percent) from Malu'u (Malaita Province), Lambi (Guadalcanal Province). On an average there were 2 eskies a day with 128 kg of fish, in addition 2 or 3 eskies of frozen fish. During market survey-2, there were no eskies of fresh fish at Rove market.

Table A-7.1 Fish Consumption Survey in Honiara and Provincial Urban
Unit: Households

	Honiara	Gizo	Auki	Buala	Kirakira	Total
Households	4,765	590	487	333	385	6560
Sampled HH	125	20	20	10	10	185
% sample	3%	3%	4%	3%	3%	(3%)

Source: 1) Solomon Islands Statistical Bulletin No. 16/92

2) Population Census, MOP, 1986

Table A-7.2 Distribution of Household Size

	Honiara	Gizo	Auki	Kirakira	Buala
1-3 members	6 (5%)	3 (12%)	4 (16%)	3 (30%)	2 (20%)
4-6 members	36 (29%)	13 (52%)	9 (36%)	2 (20%)	4 (40%)
> 6 members	83 (66%)	9 (36%)	12 (48%)	5 (50%)	4 (40%)
	125	25	25	10	10

Source: Survey of Phase 1 (The Dev. Study on Improvement of NFMS in Solomon Islands, 1993)

Table A-7.3 Occupation of Household Head

	Honiara	Gizo	Auki	Kirakira	Buala
Professional (Doctor, Lawyer, etc.)	9 (7%)	0 (0%)	0 (0%)	2 (20%)	0 (0%)
Self-employed	22 (18%)	3 (12%)	1 (4%)	0 (0%)	0 (0%)
Service (Waiter, etc.)	2 (2%)	0 (0%)	0 (0%)	1 (4%)	0 (0%)
Merchant	0 (0%)	2 (8%)	0 (0%)	1 (4%)	0 (0%)
Private company employee	36 (29%)	2 (8%)	1 (4%)	1 (4%)	0 (0%)
Govt. employee	50 (40%)	13 (52%)	21 (84%)	3 (12%)	7 (70%)
Retired	2 (2%)	0 (0%)	1 (4%)	0 (0%)	0 (0%)
Labourer	0 (0%)	0 (0%)	1 (4%)	1 (4%)	0 (0%)
Others	4 (3%)	5 (20%)	0 (0%)	1 (4%)	3 (30%)
	125	25	25	10	10

Source: Survey of Phase 1 (The Dev. Study on Improvement of NFMS in Solomon Islands, 1993)

Table A-7.4 Number of Income Earning Members in the House.

	Honiara	Gizo	Auki	Kirakira	Buala
1 member	37 (30%)	12 (48%)	19 (76%)	8 (80%)	8 (80%)
2 members	58 (46%)	9 (36%)	5 (20%)	2 (20%)	1 (10%)
3 members	18 (14%)	2 (8%)	1 (4%)	0 (0%)	1 (10%)
4 members	7 (6%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
5 members	5 (4%)	2 (8%)	0 (0%)	0 (0%)	0 (0%)
	125	25	25	10	10

Source: Survey of Phase 1 (The Dev. Study on Improvement of NFMS in Solomon Islands, 1993)

Table A-7.5 Monthly Household Income

	Honiara	Gizo	Auki	Kirakira	Buala
< \$750	23 (18%)	9 (36%)	13 (52%)	4 (40%)	4 (40%)
\$751-1000	22 (18%)	8 (32%)	6 (24%)	1 (10%)	5 (50%)
\$1001-1500	28 (22%)	1 (4%)	4 (16%)	3 (30%)	1 (10%)
\$1501-2000	20 (16%)	5 (20%)	2 (8%)	1 (10%)	0 (0%)
\$2000-4000	21 (17%)	2 (8%)	0 (0%)	1 (10%)	0 (0%)
> \$4000	11 (9%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	125	25	25	10	10

Source: Survey of Phase 1 (The Dev. Study on Improvement of NFMS in Solomon Islands, 1993)

Table A-7.6 Monthly Expenditure on Food

	Honiara	Gizo	Auki	Kirakira	Buala
<\$100	6 (5%)	2 (8%)	5 (20%)	3 (30%)	2 (20%)
\$101-200	28 (22%)	6 (24%)	7 (28%)	2 (20%)	4 (40%)
\$201-300	40 (32%)	7 (28%)	9 (36%)	1 (10%)	3 (30%)
\$301-400	20 (16%)	3 (12%)	4 (16%)	4 (40%)	1 (10%)
>\$400 --	31 (25%)	7 (28%)	0 (0%)	0 (0%)	0 (0%)
	125	25	25	10	10

Source: Survey of Phase 1 (The Dev. Study on Improvement of NFMS in Solomon Islands, 1993)

Table A-7.7 Preference of Fish or Meat/Chicken

	Honiara	Gizo	Auki	Kirakira	Buala
First Preference (Fish)	104 (83%)	22 (88%)	24 (96%)	10 (100%)	10 (100%)
Second Preference (Meat/Chicken)	21 (17%)	3 (12%)	1 (4%)	0 (0%)	0 (0%)
	125	25	25	10	10
First Preference (Meat/Chicken)	21 (17%)	3 (12%)	1 (4%)	0 (0%)	0 (0%)
Second Preference (Fish)	104 (83%)	22 (88%)	23 (96%)	10 (100%)	10 (100%)
	125	25	24	10	10

Source: Survey of Phase 1 (The Dev. Study on Improvement of NFMS in Solomon Islands, 1993)

Table A-7.8 Reasons for preferring fish as first preference

	Honiara	Gizo	Auki	Kirakira	Buala
Fresh Fish					
Like the taste/better than frozen fish	27 (22%)	1 (4%)	3 (12%)	6 (38%)	3 (30%)
Quality is good	24 (19%)	1 (4%)	4 (16%)	1 (6%)	0 (0%)
Always available	6 (5%)	3 (12%)	2 (8%)	5 (31%)	4 (40%)
Cheaper than meat/chicken	40 (32%)	20 (80%)	12 (48%)	3 (19%)	3 (30%)
Good for health	28 (22%)	0 (0%)	4 (16%)	1 (6%)	0 (0%)
	125	25	25	16	10
Frozen Fish					
Like the taste/better than Fresh fish	2 (2%)	0			
Quality is good	9 (9%)	0			
Cheaper than Fresh fish	17 (17%)	0			
Cheaper than Fresh fish & meat/chicken	28 (28%)	0			
Always available	45 (45%)	0			
	101	0	0	0	0
Canned Fish					
Can afford	60 (54%)	0	1 (4%)	5 (50%)	1 (10%)
Not messy when cooking	11 (10%)	0	1 (4%)	0 (0%)	5 (50%)
Like the taste/better than frozen fish	3 (3%)	0	1 (4%)	0 (0%)	0 (0%)
Like the taste/better than fresh fish	1 (1%)	0	0 (0%)	1 (10%)	0 (0%)
Always available	37 (33%)	0	22 (88%)	4 (40%)	4 (40%)
	112	0	25	10	10

Source: Survey of Phase 1 (The Dev. Study on Improvement of NFMS in Solomon Islands, 1993)

Table A-7.9 Reasons for not preferring fish as first preference

	Honiara	Gizo	Auki	Kirakira	Buala
Fresh Fish					
Don't like the taste	10 (20%)	1 (33%)	1 (25%)	0	0
Poor quality	14 (27%)	0 (0%)	0 (0%)	0	0
High price	17 (33%)	2 (67%)	3 (75%)	0	0
Not always available	10 (20%)	0 (0%)	0 (0%)	0	0
	51	3	4	0	0
Frozen Fish					
Don't like the taste	17 (33%)	0	0	0	0
Poor quality	17 (33%)	0	0	0	0
High price	17 (33%)	0	0	0	0
Not always available		0	0	0	0
	51	0	0	0	0

Source: Survey of Phase 1 (The Dev. Study on Improvement of NFMS in Solomon Islands, 1993)

Table A-7.10-a Frequency of fish consumption

	Honiara	Gizo	Auki	Kirakira	Buala
Fresh Fish					
Daily	6 (5%)	9 (36%)	0 (0%)	0 (0%)	1 (10%)
Once/week	40 (32%)	2 (8%)	2 (8%)	1 (10%)	1 (10%)
Twice/week	51 (41%)	2 (8%)	8 (32%)	2 (20%)	1 (10%)
3-4 times/week	25 (20%)	10 (40%)	14 (56%)	7 (70%)	7 (70%)
5-6 times/week	3 (2%)	2 (8%)	1 (4%)	0 (0%)	0 (0%)
	125	25	25	10	10
Frozen Fish					
Daily	3 (2%)	0	0	0	0
Once/week	68 (54%)	0	0	0	0
Twice/week	24 (19%)	0	0	0	0
3-4 times/week	7 (6%)	0	0	0	0
5-6 times/week		0	0	0	0
Do not eat	23 (18%)	0	0	0	0
	125	0	0	0	0
Canned Fish					
Daily	67 (54%)	4 (16%)	0 (0%)	2 (20%)	4 (40%)
Once/week	10 (8%)	7 (28%)	3 (50%)	4 (40%)	1 (10%)
Twice/week	9 (7%)	4 (16%)	2 (33%)	3 (30%)	2 (20%)
3-4 times/week	27 (22%)	10 (40%)	1 (17%)	1 (10%)	1 (10%)
5-6 times/week	12 (10%)	0 (0%)	0 (0%)	0 (0%)	2 (20%)
	125	25	6	10	10

Source: Survey of Phase 1 (The Dev. Study on Improvement of NFMS in Solomon Islands, 1993)

Table A-7.10-b Frequency of fish consumption in Honiara

Fresh fish						
Monthly Income	Responses	Fresh Fish (Reef/Pelagic)				
		Daily	1/week	2/week	3-4/week	5-6/week
<\$750	23 (18%)	1 4%	6 26%	9 39%	5 22%	2 9%
\$750-1000	22 (18%)	1 5%	8 36%	8 36%	5 23%	0 0%
\$1000-1500	27 (22%)	0 0%	7 26%	12 44%	7 26%	1 4%
\$1500-2000	20 (16%)	1 5%	8 40%	8 40%	3 15%	0 0%
\$2000-4000	22 (18%)	2 9%	9 41%	7 32%	4 18%	0 0%
>\$4000	11 (9%)	1 9%	2 18%	7 64%	1 9%	0 0%
	125	6 5%	40 32%	51 41%	25 20%	3 2%

Frozen fish						
Monthly Income	Responses	Frozen Fish (STL)				
		Daily	1/week	2/week	3-4/week	5-6/week
<\$750	21 (21%)	0 0%	19 90%	2 10%	0 0%	0 0%
\$750-1000	17 (17%)	1 6%	10 59%	4 24%	2 12%	0 0%
\$1000-1500	26 (25%)	0 0%	17 65%	6 23%	3 12%	0 0%
\$1500-2000	14 (14%)	0 0%	7 50%	5 36%	2 14%	0 0%
\$2000-4000	17 (17%)	1 6%	11 65%	4 24%	1 6%	0 0%
>\$4000	7 (7%)	0 0%	5 71%	2 29%	0 0%	0 0%
	102	2 2%	69 68%	23 23%	8 8%	0 0%

Canned fish						
Monthly Income	Responses	Canned Fish				
		Daily	1/week	2/week	3-4/week	5-6/week
<\$750	23 (18%)	15 65%	1 4%	3 13%	3 13%	1 4%
\$750-1000	22 (18%)	13 59%	1 5%	3 14%	3 14%	2 9%
\$1000-1500	27 (22%)	11 41%	1 4%	1 4%	10 37%	4 15%
\$1500-2000	20 (16%)	11 55%	4 20%	0 0%	5 25%	0 0%
\$2000-4000	22 (18%)	10 45%	2 9%	0 0%	5 23%	5 23%
>\$4000	11 (9%)	7 64%	1 9%	2 18%	1 9%	0 0%
	125	67 54%	10 8%	9 7%	27 22%	12 10%

Source: Survey of Phase 1 (The Dev. Study on Improvement of NFMS in Solomon Islands, 1993)

Table A-7.11-a Responses to Money Spend Each Time for Purchase of Fish in relation to Monthly Income

Honiara		Money Spend for Fish Purchase Each Time				
Monthly Inc Responses Income		<\$5	\$5-10	\$10-12	\$12-18	>\$20
		Converted Fish Weight Equivalent				
		<1 kg	0.8-1.6 kg	1.6-2.0 kg	2.0-3.0 kg	>3.0kg
<\$750	23 (18%)	0	3	8	7	5
		0%	13%	35%	30%	22%
\$750-1000	22 (18%)	0	2	2	11	7
		0%	9%	9%	50%	32%
\$1000-1500	27 (22%)	0	2	6	8	11
		0%	7%	22%	30%	41%
\$1500-2000	20 (16%)	1	1	2	9	7
		5%	5%	10%	45%	35%
\$2000-4000	22 (18%)	0	0	2	11	9
		0%	0%	9%	50%	41%
>\$4000	11 (9%)	0	1	1	1	8
		0%	9%	9%	9%	73%
	125 (100%)	1	9	21	47	47

Source: Survey of Phase 1 (The Dev. Study on Improvement of NFMS in Solomon Islands, 1993)

Remarks: Retail fish price of \$6.00/kg is considered.

Table A-7.11-b Number of Responses to Quantity of Fish Purchased Each Time in relation to Monthly Income

Monthly Income	Responses	Converted Fish Weight Equivalent					Total (kg)	Q'ty of fish//person per meal (kg)
		<1 kg	0.8-1.6 kg	1.6-2.5 kg	2.5-3.0 kg	>3.0kg		
<\$750	23 (18%)	0	3.9	14.4	17.5	15	50.8	0.340
\$750-1000	22 (18%)	0	2.6	3.6	27.5	21	54.7	0.383
\$1000-1500	27 (22%)	0	2.6	10.8	20	33	66.4	0.378
\$1500-2000	20 (15%)	0.8	1.3	3.6	22.5	21	49.2	0.378
\$2000-4000	22 (18%)	0	0	3.6	27.5	27	58.1	0.406
>\$4000	11 (9%)	0	1.3	1.8	2.5	24	29.6	0.414
	125 (100%)						308.8	

Source: Survey of Phase 1 (The Dev. Study on Improvement of NFMS in Solomon Islands, 1993)

Remarks: Average number of persons in an household considered is 6.5 persons.

Table A-7.12-a Responses to Money Spend Each Time for Purchase of Fish in relation to Monthly Income

Gizo

Monthly Inc Responses		Money Spend for Fish Purchase Each Time				
Income		<\$5	\$5-10	\$10-12	\$12-18	>\$20
		Converted Fish Weight Equivalent				
		<1 kg	0.8-1.6 kg	1.6-2.0 kg	2.0-3.0 kg	>3.0kg
<\$750	9 (36%)	1	6	2	0	0
		11%	67%	22%	0%	0%
\$750-1000	8 (32%)	1	2	4	0	0
		13%	25%	50%	0%	0%
\$1000-1500	1 (4%)	0	0	1	0	0
		0%	0%	100%	0%	0%
\$1500-2000	5 (20%)	0	1	4	0	0
		0%	20%	80%	0%	0%
\$2000-4000	2 (8%)	0	1	0	1	0
		0%	50%	0%	50%	0%
>\$4000	0 (0%)	0	0	0	0	0
	25 (100%)	2	10	12	1	0

Remarks: Retail fish price of \$6.00/kg is considered.

Table A-7.12-b Responses to Quantity of Fish Purchased Each Time in relation to Monthly Income

Monthly Income	Responses	Converted Fish Weight Equivalent					Total (kg)	Q'ty of fish//person per meal (kg)
		<1 kg	0.8-1.6 kg	1.6-2.5 kg	2.5-3.0 kg	>3.0kg		
<\$750	9 (36%)	0.85	8.1	3.8	0	0	12.75	0.202
\$750-1000	8 (32%)	0.85	2.7	7.6	0	0	11.15	0.199
\$1000-1500	1 (4%)	0	0	1.9	0	0	1.9	0.271
\$1500-2000	5 (20%)	0	1.35	7.6	0	0	8.95	0.256
\$2000-4000	2 (8%)	0	1.35	0	2.5	0	3.85	0.275
>\$4000	0 (0%)	0	0	0	0	0	0	0.000
	25 (100%)						38.6	

Source: Survey of Phase 1 (The Dev. Study on Improvement of NFMS in Solomon Islands, 1993)

Remarks: Average number of persons in an household considered is seven.

Table A-7.13-a Responses to Money Spend Each Time for Purchase of Fish in relation to Monthly Income

Auki

Monthly Inc Responses Income		Money Spend for Fish Purchase Each Time				
		<\$5	\$5-10	\$10-12	\$12-18	>\$20
		Converted Fish Weight Equivalent				
		<1 kg	0.8-1.6 kg	1.6-2.0 kg	2.0-3.0 kg	>3.0kg
<\$750	13 (52%)	3 23%	8 62%	1 8%	1 8%	0 0%
\$750-1000	6 (24%)	0 0%	4 67%	2 33%	0 0%	0 0%
\$1000-1500	4 (16%)	0 0%	3 75%	1 25%	0 0%	0 0%
\$1500-2000	2 (8%)	0 0%	1 50%	1 50%	0 0%	0 0%
\$2000-4000	0 (0%)	0 0%	0 0%	0 0%	0 0%	0 0%
>\$4000	0 (0%)	0 0%	0 0%	0 0%	0 0%	0 0%
	25 (100%)	3	16	5	1	0

Remarks: Retail fish price of \$6.00/kg is considered.

Table A-7.13-b Responses to Money Spend Each Time for Purchase of Fish in relation to Monthly Income

Monthly Income	Responses	Converted Fish Weight Equivalent					Total (kg)	Q'ty of fish//person per meal (kg)
		<1 kg	0.8-1.6 kg	1.6-2.5 kg	2.5-3.0 kg	>3.0kg		
<\$750	13 (52%)	2.55	10.8	1.9	2.5	0	17.75	0.195
\$750-1000	6 (24%)	0	5.4	3.8	0	0	9.2	0.219
\$1000-1500	4 (16%)	0	4.05	1.9	0	0	5.95	0.213
\$1500-2000	2 (8%)	0	1.35	1.9	0	0	3.25	0.232
\$2000-4000	0 (0%)	0	0	0	0	0	0	0.000
>\$4000	0 (0%)	0	0	0	0	0	0	0.000
	25 (100%)						36.15	

Source: Survey of Phase 1 (The Dev. Study on Improvement of NFMS in Solomon Islands, 1993)

Remarks: Average number of persons in an household considered is seven.

Table A-7.14-a Responses to Money Spend Each Time for Purchase of Fish in relation to Monthly Income

Buala

Monthly Income	Responses (HH)	Money Spend for Fish Purchase Each Time				
		<\$5	\$5-10	\$10-12	\$12-18	>\$20
		Converted Fish Weight Equivalent				
		<1 kg	0.8-1.6 kg	1.6-2.0 kg	2.0-3.0 kg	>3.0kg
<\$750	4 (40%)	1	3	0	0	0
		25%	75%	0%	0%	0%
\$750-1000	5 (50%)	0	1	3	1	0
		0%	20%	60%	20%	0%
\$1000-1500	1 (10%)	0	0	0	1	0
		0%	0%	0%	100%	0%
\$1500-2000	0 (0%)	0	0	0	0	0
		0%	0%	0%	0%	0%
\$2000-4000	0 (0%)	0	0	0	0	0
		0%	0%	0%	0%	0%
>\$4000	0 (0%)	0	0	0	0	0
		0%	0%	0%	0%	0%
	10 (40%)	1	4	3	2	0

Remarks: Retail fish price of \$6.00/kg is considered.

Table A-7.14-b Responses to Money Spend Each Time for Purchase of Fish in relation to Monthly Income

Monthly Income	Responses (HH)	Converted Fish Weight Equivalent					Total (kg)	Q'ty of fish//person per meal (kg)
		<1 kg	0.8-1.6 kg	1.6-2.5 kg	2.5-3.0 kg	>3.0kg		
<\$750	4 (16%)	0.85	4.05	0	0	0	4.9	0.175
\$750-1000	5 (20%)	0	1.35	5.7	2.5	0	9.55	0.273
\$1000-1500	1 (4%)	0	0	0	2.5	0	2.5	0.357
\$1500-2000	0 (0%)	0	0	0	0	0	0	0.000
\$2000-4000	0 (0%)	0	0	0	0	0	0	0.000
>\$4000	0 (0%)	0	0	0	0	0	0	0.000
	10 (40%)						16.95	

Source: Survey of Phase 1 (The Dev. Study on Improvement of NFMS in Solomon Islands, 1993)

Remarks: Average number of persons in an household considered is seven.

Table A-6.15-a Responses to Money Spend Each Time for Purchase of Fish in relation to Monthly Income

Kirakira

Monthly Income	Responses (HH)	Money Spend for Fish Purchase Each Time				
		<\$5	\$5-10	\$10-12	\$12-18	>\$20
		Converted Fish Weight Equivalent				
		<1 kg	0.8-1.6 kg	1.6-2.0 kg	2.0-3.0 kg	>3.0kg
<\$750	4 (40%)	0	3	0	1	0
		0%	75%	0%	25%	0%
\$750-1000	1 (10%)	0	0	1	0	0
		0%	0%	100%	0%	0%
\$1000-1500	3 (30%)	0	0	0	1	2
		0%	0%	0%	33%	67%
\$1500-2000	1 (10%)	0	0	0	1	0
		0%	0%	0%	100%	0%
\$2000-4000	1 (10%)	0	0	1	0	0
		0%	0%	100%	0%	0%
>\$4000	0 (0%)	0	0	0	0	0
		0%	0%	0%	0%	0%
	10 (100%)	0	3	2	3	2

Remarks: Retail fish price of \$6.00/kg is considered.

Table A-7.15-b Responses to Money Spend Each Time for Purchase of Fish in relation to Monthly Income

Monthly Income	Responses (HH)	Converted Fish Weight Equivalent					Total (kg)	Q'ty of fish//person per meal (kg)
		<1 kg	0.8-1.6 kg	1.6-2.5 kg	2.5-3.0 kg	>3.0kg		
<\$750	4 (16%)	0	4.05	0	2.5	0	6.55	0.234
\$750-1000	1 (4%)	0	0	1.9	0	0	1.9	0.271
\$1000-1500	3 (12%)	0	0	0	2.5	7	9.5	0.452
\$1500-2000	1 (4%)	0	0	0	2.5	0	2.5	0.000
\$2000-4000	1 (4%)	0	0	1.9	0	0	1.9	0.000
>\$4000	0 (0%)	0	0	0	0	0	0	0.000
	10 (40%)						22.35	

Source: Survey of Phase 1 (The Dev. Study on Improvement of NFMS in Solomon Islands, 1993)

Remarks: Average number of persons in an household considered is seven.

Table A-7.16 Number of Responses in Relation to Number of Canned Fish Purchased Each Time by Income in Honiara

Monthly Income	Canned Fish								Sub-total
	1 can		2 cans		3 cans		4 cans		
<\$750	2	(9%)	14	(61%)	4	(17%)	3	(13%)	23 (100%)
\$750-1000	2	(10%)	14	(70%)	0	(0%)	4	(20%)	20 (100%)
\$1000-1500	3	(10%)	18	(62%)	4	(14%)	4	(14%)	29 (100%)
\$1500-2000	0	(0%)	10	(56%)	3	(17%)	5	(28%)	18 (100%)
\$2000-4000	2	(9%)	6	(26%)	12	(52%)	3	#REF!	23 (100%)
>\$4000	1	(8%)	3	(25%)	3	(25%)	5	(42%)	12 (100%)
	10	(8%)	65	(52%)	26	(21%)	24	(19%)	125

Source: Survey of Phase 1 (The Dev. Study on Improvement of NFMS in Solomon Islands, 1993)

Table A-7.17 Number of Responses in Relation to Number of Canned Fish Purchased Each Time by Income in Gizo

Monthly Income	Canned Fish								Sub-total
	1 can		2 cans		3 cans		4 cans		
<\$750	1	(11%)	6	(67%)	2	(22%)	0	(0%)	9 (100%)
\$750-1000	1	(13%)	3	(38%)	4	(50%)	0	(0%)	8 (100%)
\$1000-1500	0	(0%)	0	(0%)	2	(100%)	0	(0%)	2 (100%)
\$1500-2000	0	(0%)	1	(25%)	3	(75%)	0	(0%)	4 (100%)
\$2000-4000	0	(0%)	1	(50%)	0	(0%)	1	(50%)	2 (100%)
>\$4000	0	(0%)	0	(0%)	0	(0%)	0	(0%)	0 (0%)
	2	(8%)	11	(44%)	11	(44%)	1	(4%)	25

Source: Survey of Phase 1 (The Dev. Study on Improvement of NFMS in Solomon Islands, 1993)

Table A-7.18 Number of Responses in Relation to Number of Canned Fish Purchased Each Time by Income in Auki

Monthly Income	Canned Fish				Sub-total
	1 can	2 cans	3 cans	4 cans	
<\$750	3 (23%)	8 (62%)	1 (8%)	1 (8%)	13 (100%)
\$750-1000	0 (0%)	4 (100%)	0 (0%)	0 (0%)	4 (100%)
\$1000-1500	0 (0%)	4 (67%)	2 (33%)	0 (0%)	6 (100%)
\$1500-2000	0 (0%)	1 (50%)	1 (50%)	0 (0%)	2 (100%)
\$2000-4000	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
>\$4000	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	3 (12%)	17 (68%)	4 (16%)	1 (4%)	25

Source: Survey of Phase 1 (The Dev. Study on Improvement of NFMS in Solomon Islands, 1993)

Table A-7.19 Number of Responses in Relation to Number of Canned Fish Purchased Each Time by Income in Buala

Monthly Income	Canned Fish				Sub-total
	1 can	2 cans	3 cans	4 cans	
<\$750	3 (75%)	0 (0%)	1 (25%)	0 (0%)	4 (100%)
\$750-1000	4 (80%)	1 (20%)	0 (0%)	0 (0%)	5 (100%)
\$1000-1500	0 (0%)	1 (100%)	0 (0%)	0 (0%)	1 (100%)
\$1500-2000	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
\$2000-4000	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
>\$4000	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	7 (70%)	2 (20%)	1 (10%)	0 (0%)	10

Source: Survey of Phase 1 (The Dev. Study on Improvement of NFMS in Solomon Islands, 1993)

Table A-7.20 No of Responses in Relation to Number of Canned Fish Purchased Each Time by Income in Kirakira

Monthly Income	Canned Fish				Sub-total
	1 can	2 cans	3 cans	4 cans	
<\$750	1 (25%)	1 (25%)	2 (50%)	0 (0%)	4 (100%)
\$750-1000	1 (100%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)
\$1000-1500	0 (0%)	1 (33%)	0 (0%)	2 (67%)	3 (100%)
\$1500-2000	1 (100%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)
\$2000-4000	0 (0%)	0 (0%)	0 (0%)	1 (100%)	1 (100%)
>\$4000	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	3 (30%)	2 (20%)	2 (20%)	3 (30%)	10

Source: Survey of Phase 1 (The Dev. Study on Improvement of NFMS in Solomon Islands, 1993)

Table A-7.21 Money spend each time buy fish

	Honiara	Gizo	Auki	Kirakira	Buala
<\$5	1 (1%)	2 (8%)	3 (12%)	0 (0%)	1 (10%)
\$5-10	9 (7%)	11 (44%)	17 (68%)	3 (30%)	3 (30%)
\$10-15	21 (17%)	11 (44%)	4 (16%)	2 (20%)	4 (40%)
\$15-20	47 (38%)	1 (4%)	1 (4%)	3 (30%)	2 (20%)
>\$20	47 (38%)	0 (0%)	0 (0%)	2 (20%)	0 (0%)
	125	25	25	10	10

Source: Survey of Phase 1 (The Dev. Study on Improvement of NFMS in Solomon Islands, 1993)

Table A-7.22 Degree of quality of fresh/frozen fish

	Honiara	Gizo	Auki	Kirakira	Buala
Fresh fish					
Excellent	25 (20%)	2 (8%)	6 (24%)	3 (30%)	5 (50%)
Good	82 (66%)	22 (88%)	17 (68%)	3 (30%)	4 (40%)
Fair	16 (13%)	1 (4%)	2 (8%)	4 (40%)	1 (10%)
Poor	2 (2%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Very bad	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	125	25	25	10	10
Frozen fish					
Excellent	1 (1%)	0	0	0	0
Good	36 (29%)	0	0	0	0
Fair	68 (54%)	0	0	0	0
Poor	20 (16%)	0	0	0	0
Very bad	0 (0%)	0	0	0	0
	125	0	0	0	0

Source: Survey of Phase 1 (The Dev. Study on Improvement of NFMS in Solomon Islands, 1993)

Table A-7.23 Estimated Quantity of Fresh Fish Traded in Central Market (June21-July10, 1993)

Date	Day	Q'ty (kg)	Number of Eskies by Origin							Total	
			Fl. Is.	Russel Is	Isabel	Lambi	Ramos Is	Malu'u	Fishing Vil.		Marau
21-Jun	Mon	270	5								5
22-Jun	Tues	165	3								3
23-Jun	Wed	185	3								3
24-Jun	Thu										0
25-Jun	Fri	115	2					1			3
26-Jun	Sat										0
27-Jun	Sun										0
28-Jun	Mon	270	3					1			4
29-Jun	Tues	290	4								4
30-Jun	Wed	260	6								6
1-Jul	Thu	180	3	1							4
2-Jul	Fri	275	1		3						4
3-Jul	Sat	100			3						3
4-Jul	Sun										0
5-Jul	Mon	120	2								2
6-Jul	Tues	160	3								3
7-Jul	Wed										0
8-Jul	Thu	270	2	1						1	4
9-Jul	Fri	380	5							2	7
10-Jul	Sat	240	4								4
11-Jul	Sun										0
12-Jul	Mon	410	3		1	1				1	6
		3,690	49	2	7	1	0	0	2	4	65
			75%	3%	11%	2%	0%	0%	3%	6%	

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

Table A-7.24 Estimated Quantity of Fresh Fish Traded in Rove Market (June21-July10, 1993)

Date	Day	Q'ty (kg)	Number of Eskies by Origin							Total	
			Fl. Is.	Russel Is	Isabel	Lambi	Ramos Is	Malu'u	Fishing Vil.		Marau
21-Jun	Mon									0	
22-Jun	Tues									0	
23-Jun	Wed									0	
24-Jun	Thu	300	4	1						5	
25-Jun	Fri	50		1						1	
26-Jun	Sat	100	1	1						2	
27-Jun	Sun	80	1	1						2	
28-Jun	Mon									0	
29-Jun	Tues									0	
30-Jun	Wed	70		1						1	
1-Jul	Thu	110		1			1			2	
2-Jul	Fri									0	
3-Jul	Sat									0	
4-Jul	Sun	310	2			1	1	1		5	
5-Jul	Mon	30	1							1	
6-Jul	Tues									0	
7-Jul	Wed	170		2						2	
8-Jul	Thu	80		2						2	
9-Jul	Fri	70				1				1	
10-Jul	Sat									0	
11-Jul	Sun									0	
12-Jul	Mon	170	1	1						2	
		1,540	10	11	0	2	1	2	0	0	26
			38%	42%		8%	4%	8%			

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

Table A-7.25 Results of Market Survey in Honiara (Sept. 27 - Oct.30, 1993) (1/3)

Date	Day	Origin	Sandfly	Buena Vista	Big Gela	Small Gela	Lambi	Marau	Isabel	Russel	Malaita	Others	Total
27-Sep	Mon	No. of eskys	4	2	2			4	4				16
		Kg	400	200	200			400	300				1,500
		No. of boats	4	2	2								8
28-Sep	Tue	No. of eskys	9	5	5			1	2				22
		Kg	700	300	500								1,500
		No. of boats	7	3	5								15
29-Sep	Wed	No. of eskys	8		4	1			7	1	1	1	23
		Kg	550		200	100			700	100	100	100	1,850
		No. of boats	6		2	1							9
30-Sep	Thu	No. of eskys	5	4	1	1		2	5	1	5		24
		Kg	400	400	100	100		200			100		1,300
		No. of boats	4	4	1	1							10
1-Oct	Fri	No. of eskys	4	1					7		3		15
		Kg	300	100					400		200		1,000
		No. of boats	3	1									4
2-Oct	Sat	No. of eskys	5				2						7
		Kg	500				200						700
		No. of boats	5										5
Weekly		No. of eskys	35	12	12	2	2	7	25	2	9	2	108
Sub-total		Kg	2,850	1,000	1,000	200	200	600	1,400	100	400	200	7,950
		No. of boats	29	10	10	2							51
4-Oct	Mon	No. of eskys	4	1					2				7
		Kg	400	100					200				700
		No. of boats	4	1									5
5-Oct	Tue	No. of eskys	3		1				1	1			6
		Kg			100				100	100			300
		No. of boats			1								1
6-Oct	Wed	No. of eskys		1	3				3	1			8
		Kg		100	300				300	100			800
		No. of boats		1	3								4
7-Oct	Thu	No. of eskys	2		1	1	1						5
		Kg	200			100	100						400
		No. of boats	2			1							3
8-Oct	Fri	No. of eskys	4		4			1	2	1			12
		Kg	400		300			100	100	100			1,000
		No. of boats	4		3								7
9-Oct	Sat	No. of eskys	3		2	1	1		1				8
		Kg	300		200	100	100		100				800
		No. of boats	3		2	1							6
Weekly		No. of eskys	16	2	11	2	2	1	9	3	0	0	46
Sub-total		Kg	1,300	200	900	200	200	100	800	300	0	0	4,000
		No. of boats	13	2	9	2							26

Source: Survey of Phase 2 (The Dev. Study on Improvement of NFMS in Solomon Islands, 1993)

Table A-7.25 Results of Market Survey in Honiara (Sept. 27 - Oct.30, 1993) (2/3)

Date	Day	Origin	Sandfly	Buena Vista	Big Gela	Small Gela	Lambi	Marau	Isabel	Russel	Malaita	Others	Total
11-Oct	Mon	No. of eskys	6		1	4		2				1	14
		Kg	600		100	400		100				100	1,300
		No. of boats	6		1	4							11
12-Oct	Tue	No. of eskys	2	4						3		1	10
		Kg		400						300		100	800
		No. of boats		4									4
13-Oct	Wed	No. of eskys	7	2	3					1		1	14
		Kg	700	200	300							100	1,300
		No. of boats	7	2	3								12
14-Oct	Thu	No. of eskys	8	2	4	2							16
		Kg	800		100	200							1,100
		No. of boats	8		1	2							11
		Sold	700	100	200	100							
15-Oct	Fri	No. of eskys	6	1	5	6			9		3	1	31
		Kg	400	100	400	400			900		300	100	2,600
		No. of boats	4	1	4	4							13
16-Oct	Sat	No. of eskys	2		3	2			6		3		16
		Kg			100						200		300
		No. of boats			1								1
Weekly		No. of eskys	31	9	16	14	0	2	15	4	6	4	101
Sub-total		Kg	2,500	700	1,000	1,000	0	100	900	300	500	400	7,400
		No. of boats	25	7	10	10							52
18-Oct	Mon	No. of eskys	2	1	4	1							8
		Kg	200	100	400	100							800
		No. of boats	2	1	4	1							8
19-Oct	Tue	No. of eskys	4	4	3	2				3			16
		Kg	200	400		200				300			1,100
		No. of boats	2	4		2							8
20-Oct	Wed	No. of eskys	2	6	2	2							12
		Kg	200	400	200	100							900
		No. of boats	2	4	2	1							9
21-Oct	Thu	No. of eskys	4	3	2	3						2	14
		Kg	200	200	200	300						200	1,100
		No. of boats	2	2	2	3							9
22-Oct	Fri	No. of eskys	2		7	4	1					1	15
		Kg	200		500	400	100					100	1,300
		No. of boats	2		5	4							11
23-Oct	Sat	No. of eskys	6	1	4	3	2						16
		Kg	600	100	200	300	200						1,400
		No. of boats	6	1	2	3							12
Weekly		No. of eskys	20	15	22	15	3	0	0	3	0	3	81
Sub-total		Kg	1,600	1,200	1,500	1,400	300	0	0	300	0	300	6,600
		No. of boats	16	12	15	14							57

Source: Survey of Phase 2 (The Dev. Study on Improvement of NFMS in Solomon Islands, 1993)

Table A-7.25 Results of Market Survey in Honiara (Sept. 27 - Oct.30, 1993) (3/3)

Date	Day		Sandfly	Buena Vista	Big Gela	Small Gela	Lambi	Marau	Isabel	Russel	Malaita	Others	Total
25-Oct	Mon	No. of eskys	4	1	7	3							15
		Kg	200	100	600	300							1,200
		No. of boats	2	1	6	3							12
26-Oct	Tue	No. of eskys	4	1	8	1	1			5		1	21
		Kg	200		500	100	50			500		100	1,450
		No. of boats	2		5	1							8
27-Oct	Wed	No. of eskys	9	3	7	1				4			24
		Kg	900	200	400	100				400			2,000
		No. of boats	9	2	4	1							16
28-Oct	Thu	No. of eskys	6		4	6			13	2		1	32
		Kg	200		400	600			1,300	200		100	2,800
		No. of boats	2		4	6							12
29-Oct	Fri	No. of eskys	3	1	3	1	1		9	1	2	1	22
		Kg	300	100	300	100	100				200	100	1,200
		No. of boats	3	1	3	1							8
30-Oct	Sat	No. of eskys	6	3	4	1	2						16
		Kg	600	300	400	100	200						1,600
		No. of boats	6	3	4	1							14
Weekly		No. of eskys	32	9	33	13	4	0	22	12	2	3	130
Sub-total		Kg	2,400	700	2,600	1,300	350	0	1,300	1,100	200	300	10,250
		No. of boats	24	7	26	13							70

Date	Day		Sandfly	Buena Vista	Big Gela	Small Gela	Lambi	Marau	Isabel	Russel	Malaita	Others	Total
Monthly total													
		No. of eskys	134	47	94	46	11	10	71	24	17	12	466
		Kg	10,650	3,800	7,000	4,100	1,050	800	4,400	2,100	1,100	1,200	36,200
		No. of boats	107	38	70	41	0	0	0	0	0	0	256

Source: Survey of Phase 2 (The Dev. Study on Improvement of NFMS in Solomon Islands, 1993)

Annex - 8 Infrastructure

(A) Electricity

(1) Operational ratio and profitability of the power stations

A cost breakdown and the expenditures and revenues of the small diesel power station in Kirakira and the Malu'u hydro power station are shown in Table A-8.1.

1) Operation ratio of the power stations

Presently, the operation ratio of the power stations averages a low 54 percent. The effect of an improved operation ratio on the balance of expenditures and revenues of the power stations at Kirakira and Malu'u are shown below.

It was assumed that during periods of peak demand, the power stations were in operation to maximum capacity. Peak demand was established at 80kw (Kirakira) and 10kw (Malu'u), in accordance with 1991 records.

2) Maximum capacity operation

	<u>Capacity/peak demand</u>	<u>Amount Sold</u>
Kirakira	$170\text{kw}/80\text{kw} = 2.1$	$\$28,385 \times 2.1 = \$59,609$
Malu'u	$30\text{kw}/10\text{kw} = 3.0$	$\$3,209 \times 3.0 = \$9,627$

3) Fuel Costs

The fuel costs of the Kirakira power station has increased in comparison to the operational load of its generator; and calculations were made accordingly as shown below.

Fuel consumption ratio = 2kwh/liter (actual figure of Kirakira, 2.04kwh/liter)*1

Fuel costs = 85.16 cents/liter (Kirakira figures from April to June '93)*2

$0.8516\$/\text{liter} \times 53,000\text{kwh}/2\text{kwh}/\text{liter} \times 2.1 = \$47,392$

Initial fuel costs = $\$0.8516 \times 53,000\text{kwh}/2\text{kwh}/\text{liter} = \$22,567$

Increased costs = $\$47,392 - \$22,567 = \$24,825$

When the actual figures given above are calculated during full operation, the following breakdown is achieved.

Item	Kirakira	Malu'u
A. Energy sold	111,300 Kwh	21,000 Kwh
B. Sales amount	\$59,609 (\$0.54/Kwh)	\$9,627 (\$0.46/Kwh)
C. Cost	\$121,867 (\$1.10/Kwh)	\$21,247 (\$1.01/Kwh)
D. Deficit (C-B)	\$62,258	\$11,620
E. Deficit per Kwh(D/A)	\$0.56/Kwh	\$0.55/Kwh

In studying the ratio of shortages in terms of the actual sales amount, the following breakdown is achieved.

Operation	Kirakira	Malu'u
Actual Operation	SI\$68,657/SI\$28,385=242% SI\$1.30/Kwh (0.47)	SI\$18,038/SI\$3,209=562% SI\$2.58/Kwh (0.33)
Full Operation	SI\$62,258/SI\$59,609=104% SI\$0.56/Kwh (1.0)	SI\$11,620/SI\$9,627=121% SI\$0.55/Kwh (1.0)

(2) Fuel consumption ratio

Based on the actual operation figures of 1992, the relation between the scope of power facilities and the efficiency of fuel consumption is shown in Table A-8.2. The graduation of the KW value, showing the scope of facilities on the horizontal axis, indicates the square root.

The fuel consumption ratio rapidly decreases when the scope becomes larger than 1,000Kw, as shown in the figure above, then gradually falls, and finally levels off when the scope surpasses 2,000Kw.

The unit cost of diesel oil from April to June 1993 was 85.76 cents/liter in Kirakira in comparison to Honiara which was 18 percent cheaper at 70.16 cents/liter.

Costs incurred by the Honiara power station such as the fuel consumption ratio and the unit cost of fuel was less than the costs incurred by the Kirakira power station. Based on these factors, the profitability of the Honiara power station was studied and the results are given in Table A-8.1.

(3) Profitability of power stations

According to Table A-8.1, annual profits of the Honiara power station is about SI\$5 million under the current system of electricity charges. This is equivalent to 16.96 cents/Kwh. A comparison of this figure to the deficits incurred by the small power stations is shown below.

The total volume of electricity produced by 7 small power stations (1991) = 2,721,019Kwh

Estimated deficit (deficit ratio of Kirakira station is roughly SI\$1.30/Kwh) = 3,537,325Kwh

Profit of Honiara station minus the deficit of seven stations = SI\$4,989,462 - SI\$3,537,325 = SI\$1,452,137

The profits of the Honiara power station offset the deficits of the small, local power stations and it is still left with a surplus. Although the capacity of the Noro power station is large at 3,000Kw, its fuel consumption costs are 0.26 liters/Kwh (1992) which is lower than Honiara's 0.28 liters/Kwh, indicating an efficiency comparable to that of the Honiara station. Subsequently, its expenditures and revenues were set at ± 0 .

Based on the aforementioned analytical findings, it was concluded that the profitability of all nine power stations nationwide was in the black. Furthermore, it was concluded that the differences in expenditure and revenue produced by increased facilities and expanded capacities of small power stations planned in this project, will be sufficiently offset on a nationwide scale.

In order to reduce the shortages in expenditure and revenue of small, local power stations, the overall balance in expenditures and revenue of electricity must be improved. One example of this is the aforementioned case where a cable will be laid from the Noro power station to offset the growing demands of the Munda power station. After the cable has been installed, the Munda power station will also become a supplementary station in times of emergency and the deficits of both power stations will be eliminated. The deficit of the Noro power station according to SIEA calculations are shown in Table A-8.3.

According to this table, it is projected that the annual deficit will be reduced from SI\$82,344 to SI\$5,603, a decrease of about SI\$77,000. Although installation costs of the cable are estimated at SI\$1,998,400, the following benefits listed are anticipated.

- 1) A stable supply of electricity will be available for hospitals, schools, water supply facilities, and the Munda airport (to allow use at night).

- 2) A restricted supply of electricity will no longer impede the development of new businesses, factories, and other infrastructure.
- 3) The operation ratio of the Noro power station will improve.

(B) Transportation

A comparative analysis of transport according to time and cost was analysed and the cost of actual transport time in each area was compared.

1) Actual transport time

	Section		Distance	Time	Speed	Transport mode
Road	Noro	~ Munda	17 Km	0.7	24.4 K/hr	Truck
	Auki	~ Malu'u	82	2.5	33.0	Truck
	Malu'u	~ Takuwa	20	0.8	25.0	Truck
	Honiara	~ Lambi	72	1.7	42.0	Truck
Sea	Buala	~ Tatamba	50	2.0 ~ 2.5	20 ~ 25	Boat
	Honiara	~ Tulagi	40	1.8	23.0	Boat

2) Road and ocean route conditions

Road and ocean route conditions were categorized and the speed of road and sea traffic was estimated.

Medium	Estimated speed	Transport mode
Sales Road (2 way)	60 Km/hr	Truck
Gravel Road (2 way)	30	Truck
Gravel 4 ~ 5 m Wide Road (1 way)	24	Truck
Under 4 m Wide Road (1 way)	15	Truck
Sea Located among Islands	25	Boat
Open Sea	22	Boat

3) Required travel time

Sea or Land	Section	Distance	Speed	Time	Methodogy	
Land	Noro ~ Munda	17 Km	30 Km/hr	0.6 hr	Truck	
Sea	Noro ~ Munda	24 Km	25 Km/hr	1.0 hr	Boat	
Land	Auki ~ Malu'u	82 Km	30 Km/hr	2.7 hr	Truck	
Land	Malu'u ~ Takuwa	20 Km	24 km/hr	0.8 hr	Truck	
Sea	Auki ~ Malu'u	75 km	22 Km/hr	3.4 hr	Boat	
Sea	Malu'u ~ Takuwa	32 Km	25 Km/hr	1.3 hr	Boat	
Land	Honiara ~ Mangakiki	57 Km	60 Km/hr	1.0 hr	Truck	
Land	Mangakiki ~ Lambi	15 Km	15 Km/hr	1.0 hr	Truck	
Sea	Honiara ~ Lambi	72 Km	22 Km/hr	3.3 hr	Boat	
Land	Honiara ~ Aola	75 Km	50 Km	60 Km/hr	0.8 hr	Truck
			25 Km	30 Km/hr		
Sea	Aoloa ~ Marau	58 Km	25 Km/hr	2.3 hr	Boat	
Sea	Honiara ~ Marau	133 Km	25 Km/hr	5.3 hr	Boat	

Remarks: The speed of truck or boat shown here is estimated average speed considering bad weather condition.

- Analytical findings on required travel time

Noro - Munda

Land: 0.6 hours Ocean: 1.0 hour

Auki - Takuwa

Land: 3.5 hours Ocean: 4.7 hours

Honiara - Lambi

Land: 2.0 hours Ocean: 3.3 hours

Honiara - Marau

Land and ocean travel (no roads): 3.9 hours (excluding transfer time)

Ocean travel only: 5.3 hours

- Land travel requires less time than ocean travel in all the aforementioned areas, within the scope of the actual estimated speed. (The areas given above have comparatively good roads.)
- In some areas where there are no roads, the transfer time between land and ocean travel has not been included.
- The road conditions were categorized into four stages. The roads other than the sealed road, have inadequate bridge facilities, where the width and height require renovation.

4) Transport costs

The estimated ocean and land transport costs of major routes were calculated based on the actual transport cost below.

a) Actual transport cost of esky

Section	Distance	Full Esky	Empty Esky	Person	Transport Mode
Auki ~ Malu'u/Takuwa	82/102 Km	\$50/Esky	\$25/Esky	-	Truck
Honiara ~ Auki	98	25	10	25	Ship
Honiara ~ Buala/Tatamba	155/105	20	10	25 ~ 30	Ship
Honiara ~ Kirakira	233	22	12	45 ~ 45	Ship

b) Estimated Transport cost of Esky

Section	Distance	Full Esky	Empty Esky	Person	Transport Mode
Honiara ~ Gizo*	383 Km	\$42/Esky	\$21/Esky	50 ~ 60	Ship
Honiara ~ Tulagi	40	15	8	10	Boat
Honiara ~ Lambi	72	20	10	20	Boat
Honiara ~ Choiseul Bay	465	50	25	65	Ship
Honiara ~ Lata*	620	60	30	70	Sip
Honiara ~ Lavanggu*	340	40	20	50	

Remarks: * Actual Transport Cost, 1993

The actual transport time, costs, etc. of major areas were combined with the factors found in other routes and were calculated accordingly.

Table A-8.1 Revenue and Operating Cost at Kirakira, Malu'u (from Jan. to March in 1993) and Honiara (1992) power stations

Items	Kirakira			Malu'u			Honiara		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
	Budget	Actual	Achievement Ratio ((2)/(1)x100)	Budget	Actual	Achievement Ratio ((2)/(1)x100)	Budget	Actual	Achievement Ratio ((2)/(1)x100)
1. Energy Source	Oil (Diesel)			Mini Hydro			Oil (Diesel)		
2. Continuous Output (kw)		170			30			12,280	
3. Year of Installation	1) 2 units : 1986 2) 1 unit : 1984			1 units : 1986					
4. Total Energy sold (kwh)	60,000	53,000	88	7,000	7,000	100	-	29,416,683	-
5. Electricity Sales (SI\$)									
Domestic	-	5,037	-	-	974	-	-	2,259,765	-
Government	-	11,858	-	-	1,358	-	-	1,450,522	-
Commercial	-	3,210	-	-	225	-	-	6,038,030	-
Industrial	-	32	-	-	-	-	-	1,843,360	-
Others	-	89	-	-	53	-	-	294,965	-
Minimum Charge	-	695	-	-	187	-	-	233,424	-
Service Charge	-	1,280	-	-	412	-	-	-	-
Fuel Adjustments	-	6,184	-	-	-	-	-	3,235,835	-
Total Revenue	33,153	28,385	86	3,303	3,209	97	-	15,355,901	-
6. Cost (SI\$)									
Power Generation									
Costs	-	75,529	-	-	5,209	-	-	-	-
Distribution									
Costs	-	12,366	-	-	14,003	-	-	-	-
Overhead Admin	-	9,147	-	-	2,035	-	-	-	-
Total Costs	77,771	97,042	125	13,676	21,247	155	-	10,366,439	-
7. Benefit	-44,618	68,657	-	-10,373	-18,038	-	-	4,989,462	-

Source : (1) SIEA System Guide, Brief Description, Feb.1993, SIEA
(2) Data 1993, SIEA
(3) Prefeasibility Studies of Hydro-power Projects in SI., Ju1.1986, UNIDO.

Table A-8.2 Fuel Consumption Versus Capacity (1992)

Location		Capacity (Kw)	Fuel Consumption Per Unit Electricity Generated (l/Kwh)
Town	Province		
1. Buala	Isabel	60	0.37
2. Lata	Temotu	108	0.51
3. Munda	Western	135	0.41
4. Kirakira	Makira	170	0.38
5. Auki	Malaita	600	0.29
6. Gizo	Western	600	0.28
7. Noro	Western	3,000	0.26
9. Honiara	Guadacanal	12,280	0.28

Source : SIEA System Guide, Brief Description, 1993, SIEA

Table A-8.3 Benefit of Supplying Electricity to Munda from Noro Power Station

Unit : SI\$		
Item	Munda (1990)	Supply from Noro (Estimated)
Generation Costs	97,963	61,550
Distribution Costs	44,528	4,200
Overhead & Admin Costs	19,550	19,550
Total Operating Costs	162,041	85,300
Revenue Derived from Sales	79,697	79,697
Benefit	-82,344	-5,603

Source : SIEA Project Document Revision B, Nov.1992, SIEA,