

Chapter 3
Implementation Plan

Chapter 3. Implementation Plan

3-1 Implementation Plan

3-1-1 Implementation Concept

In implementing the Project, the following concept is to be applied in accordance with the intention of Japan's Grant Aid Program.

- (1) To promote smooth implementation of the Project, further efforts shall be made to achieve mutual understanding through full exchange of opinions between all of the parties concerned; Department of State for Presidential Affairs, Department of Fisheries & Natural Resources, Fisheries Department, local administrations, Department of Finance and Economic Affairs, Planning Department, the Consultant, the Contractor and so on.
- (2) The proposed site is located at the Tanji fish landing site on the Atlantic coast, 28 km away from the Capital of Banjul. The procurement of labor, equipment and construction materials seems to be comparatively easy, but the transportation of these equipment and materials to the Project site must take the road works between Bakau and Banjul to be commenced in July 1999 into consideration. In procuring equipment and materials, wares of good quality shall be secured in accordance with an effective operation plan of skilled labor and construction machinery.
- (3) The Project site is owned by the Government and managed by the Tanji Fishery Cooperative. During construction work, taking the problems concerning influence on surroundings, relocating space for vendors in service, removal of existing buildings and so on into consideration, a working method minimized the working volume shall be applied. A full explanation shall be given to the Gambia Government on relocating vendors so that the Government can have enough time to cope with.

(4) Heavy noises are not expected during construction works, but a noise control measure shall be taken to minimize the influence on surroundings, if necessary.

(5) To keep the accuracy and quality of construction work the followings shall be considered.

1) Measures against salt damages

Since the construction site is subject to salt damage due to the proximity to the sea, salt-resistant materials shall be selected and also proper measures against salt damage shall be taken to protect equipment and materials during construction work.

2) Quality control of concrete

Careful quality control shall be applied to concrete to be used for foundation and building. Alkali-silica content of aggregate shall be checked (below 300g/cubic meter) and a mixing plan with fly-ash cement instead of normal Portland cement shall be examined. In casting concrete, washing aggregate and measuring workability shall be conducted.

3) Quality control of equipment and performance test

As to ice-making machine, refrigerator, generator, and etc., specially ordered equipment is inspected in the process of manufacturing and performance tests are closely examined with Project members attending. In the Republic of Gambia a permanent stationed controller inspects. At the time of completion, a technical specialists are sent for inspection and at the time of delivery, they provide precise instructions on operation/maintenance of the equipment for the counterpart technicians.

4) Procurement of construction materials

Main structural materials and auxiliary materials to be used for foundation and main structure are procured in the field as much as possible, and local methods of construction which has proved effectiveness will be applied.

Procurement of refrigeration truck and FRP fishing boats is more freely made from Japan or third countries with after-sale services and procurement of spare parts taken into account, so that quality materials may be supplied.

- (6) The construction work of the Project is divided in two parts; one is a construction work of the Fishery Centre building and another is a construction work of the facility for supplying groundwater. Since maintaining water supply is essential during construction works, digging work of the well shall be conducted before construction of the centre building. A Ten month construction period is expected.

3-1-2 Implementation Conditions

Although large-scale construction works such as the New International Airport of Banjul and a monument in the Revolution Park have been conducted in the Gambia by local prime contractors, moderate-scaled construction companies are a few. Also engineers, professionals and skilled labor are not enough, and hence part of them must be imported from Senegal.

In addition, the following points shall be kept in mind.

- The period from August through October is the rainy season when down pours of rain are experienced.
- Almost all construction materials available locally are imported from Senegal or Europe via Senegal. Sand for concrete, cement and reinforced bars come from Senegal. Aggregate and crushed stones for gabion are available in the Gambia.
- The pavement work of the road between Banjul and Tanji is to be commenced in July 1999. The transport of large-sized construction machinery and materials in bulk may be made through detours.

3-1-3 Scope of Works

Works to be borne by the Gambia side are as follows. Removing existing structures and leveling site ground must be completed prior to the commencement of the Project. Construction work and procurement of equipment and materials are conducted by Japan side.

Table 3-1-1 Works to be borne by the Gambia

- | |
|---|
| <ol style="list-style-type: none">1) Securing the Project site.2) Removal of existing buildings.3) Leveling ground of the Project site.4) Securing relocation place for vendors in the Project site. |
|---|

3-1-4 Consultant Supervision

Consultant supervision is conducted with attention paid to the following points.

- (1) With the progress of the Project, the Consultant shall enhance contact with the implementing agency, Fisheries Department. From the standpoint of works executed by the Japan side, the schedule and specifications on securing the site, removal of existing buildings and leveling site ground should be fully discussed in advance.
- (2) Prior to the commencement of the work the Consultant shall examine carefully the construction planning and working diagrams submitted by the Contractor, and inspect the appropriateness of the plan of temporary works, progress schedule, quality of materials to be used, construction method and so on
- (3) On the completion of the Project the Consultant shall check the final contents of works in conformity with the designed specifications, and give proper instructions to the Contractor when modifications are required.
- (4) The Project Manager is responsible for comprehensive execution management of the Project with technical assistance of the civil engineer and architect.

3-1-5 Procurement Plan

Construction materials available locally are confined to sand/gravel for aggregate and concrete blocks. Apart from local stock, cement, reinforcing bars, steel bars, plywood panels and electric/piping materials for general use depend mainly on import from Senegal. Construction materials (cement, reinforcing bars, wooden forms, metal forms, etc.) are in principle to be procured locally. Materials unavailable locally or unsuitable for the Project due to inferior quality or poor stock are to be procured in Japan or the third countries and transported to the Gambia by sea.

Almost construction machinery is available in the Gambia except a few special ones.

Table 3-1-2 Procurement List of Materials and Equipment

Item	To be procured
(A) Construction machine	
(B) General construction machine	Gambia
(C) General construction material	Gambia, third country, Japan
(D) Machinery	
Ice maker	Japan
Chilled storage	Japan
Generator	Japan
Refrigeration truck	Japan, Europe, third country
Insulated box	Japan, third country
FRP fishing boat	Japan, Europe, Mauritania
Outboard engine	Japan
Fishing gear	Japan

3-1-6 Implementation Schedule

Generally speaking, when a Japan's Grant Aid project is implemented, following Exchange of Notes between the Governments of Japan and recipient country, a tender will be made based on the tender documents prepared by the Consultant to determine a Contractor, and then, after the Construction Contract, the Contractor will execute the work. In this Project, its Implementation Schedule is as follows;

(1) Detail design work

The Consultant will work out a detail design based on the Basic Design Study Report, and prepare the tender documents to select a contractor. This work will take two (2) or two and half (2.5) months to complete.

(2) Tender

After the completion of the detail design, a tender to determine the Contractor will be made. The period between the tender announcement and the construction contract will be about two (2) months.

(3) Construction work

On the verification of the Construction Contract by the Government of Japan, the construction work will start. When the works borne by the Gambia side is completed without delay, the construction work concerning the Tanji Fishery Centre will finish in ten (10) months to complete.

Table 3-1-3 Implementation Schedule (draft)

Month	1	2	3	4	5	6	7	8	9	10
(Detail Design)	(Site Survey)									
		(Works in Japan)								
			(Site Survey)							

Month	1	2	3	4	5	6	7	8	9	10
(Constructions)	(Preparation)									
		(Foundation)								
				(Building)						
		(Installation Exterior)	(Interior Finish Works)							
							(Exterior works)			
									(Delivery · Training)	
(Equipment Materials)		(Preparation · Approval)								
			(Making · Procurement)							
							(Installation · Procurement)			

3-1-7 Undertakings to be borne by the Recipient Country

Table 2-3 shows major undertakings to be taken by each side. Removal of existing buildings and leveling the site ground must be completed before the commencement of the Project.

Table 3-1-4 Major undertakings to be taken by each Government

Contents	Japan	Gambia
1. To secure land, to remove existing buildings, leveling ground, to secure relocation site, and to take measures necessary for continuation of current fishing activities.		○
2. Construction work (Tanji Fishery Center)	○	
3. Import and Customs procedure (1) Transportation to the Gambia and inland transport. (2) Tax exemption and Customs procedure.	○	○
4. Bank commissions		○
5. To afford convenience to Japanese staff working for the Project on entry into and stay in the Gambia.		○
6. To maintain and use properly and effectively the facilities provided by the Grant Aid.		
7. To bear all the expenses, other than those to be borne by the Grant Aid, necessary for construction of the facilities as well as for the transportation and installation of the equipment and furniture.		○
8. To make all procedures of application and to get all authorizations and permits concerning construction.		○
9. To exempt internal taxes and other fiscal levies concerning the procurement of materials and services in the Gambia by the Contractor.		○

3-2 Cost Estimation Borne by the Recipient Country

3-2-1 Cost Estimation Borne by the Recipient Country

Construction cost borne by the Gambia side is estimated at about 103 thousand dalasis and the details are as follows:

Table 3-2-1 Construction works borne by Gambia

Items	Amount
Removal of existing structures & Leveling site ground	43 thousand dalasis
Relocation of vendors in the Project site	20 thousand dalasis
Others (bank commissions, etc.)	40 thousand dalasis
Total	103 thousand dalasis

3-2-2 Operation and Maintenance Plan

(1) Management system

The Project facilities are to be managed by the Tanji Fishery Management Committee which is controlling the existing fishery-related facilities at Tanji, and the Fisheries Department which has an experience in the management of the Bakau Project will give a lead to the Management Committee. Management staff is planned to be thirteen (13) in total, of which four (4) persons are from the Fisheries department and the remaining nine (9) will come from the Tanji fishery community. Basic management method will apply the Bakau Project management method.

Major management works at the Fishery Center include the management of the Center building, ice making/storage facilities and their attached facilities, and operation and maintenance of refrigeration trucks, insulated boxes, etc. and major tasks of the Center are selling ice and collecting fees and charges (chilled store, refrigeration trucks, insulated boxes, fish boxes, etc.). Also such daily works as cleaning the premises and refuse disposal must be conducted. These

works will be carried out by thirteen (13) staff as follows;

Table 3-2-2 Staffing at the Fishery Center

Position	Number	Duty
Management Committee member	3 (1)	<ul style="list-style-type: none"> • Responsibility for routine work • Recording and Reporting • Handling money • Control of spare parts
Refrigeration Mechanics	3 (2)	<ul style="list-style-type: none"> • Operation and maintenance of the machinery
Supervisor of fishing boat	2	<ul style="list-style-type: none"> • Operation and maintenance of fishing boat/gear
O.B.E. Mechanics	1 (1)	<ul style="list-style-type: none"> • Repair and Maintenance of O.B.E.
Chief Cashier	1	<ul style="list-style-type: none"> • Selling of ice • Collection of fees and charges
Guardsmen / cleaner	3	<ul style="list-style-type: none"> • Security of the premises and cleaning
Total	13 (4)	

The staff from the Fisheries Department are bracketed.

(2) Maintenance of equipment & machinery

1) Ice-making machine, chilled storage and generator

As to ice-making machine, chilled storage and generator continued operation is preferable but if necessary, they should be stopped for daily maintenance. An inspection of one-month-long is necessary once a year. The generator installed in the facility also requires similar maintenance. As the technicians of Fisheries Department at Bakau site are well trained, they will be sent to Tanji for above maintenance. They give around-the-clock maintenance. In Bakau, their duties include change of spare parts as well.

2) Refrigeration truck

It takes 3 days for a refrigeration truck to transport fresh fish to inland area. Aiming at daily start of one truck each, three trucks are to be introduced. Making reference to the operation schedule at Bakau Project, and under control of drivers/managers of Tanji Management Committee, transport fees are

collected from private fish dealers. Maintenance of trucks is possible to some extent, by the engineers at machinery repair division of Fisheries Department. Large scale repair works are entrusted to private work-shops.

3) Insulated box and fish box

Insulated boxes are used to stock demersal fish for a couple of days till they are sold on the landing sites at Brufut, Batokunku and Sanyang, or to stock Bonga at the marketing bases of inland area. Insulated boxes are usually used at landing sites under control of Tanji Management Committee and field officers of Fisheries Department. At marketing bases, they are under control of a branch office of Fisheries Department and in other area where they have no branch office, middlemen's Management Committee is responsible to handle them.

4) FRP fishing boat and fishing gear

Fisheries Department gives the right of ownership, management, and administration on the fishing boats and fishing gears to Tanji Management Committee, and the Management Committee has a duty to reserve fund for it. Among others, maintenance of outboard engines is important and the mechanics at the Management Committee who are currently working for them are responsible.

The following standards are applied in selecting fishermen for leasing.

- a) The fisherman must be a Gambian
- b) The fisherman must be a citizen of Tanji village
- c) He must be a recognized fisherman
- d) He must be of exemplary character

The fishermen are paid 60% after the deduction of expenditure from total proceeds (sale of fish), and the Project retains 40% which is deposited in the Project Bank Account.

(3) Management plan

In accordance with the benefit principle, adequate fees or charges on the Center facilities, equipment, and materials are to be collected. This revenue has to cover the management costs.

The followings are the estimated management costs annually.

The estimated annual management costs of the Center is D 2.1 million as below. The Center can expect a revenue of some D 2.8 million from sales of ice and fees/charges of facilities and materials, resulting in a profit of some D 700 thousand annually, and hence it is judged that the Center will be managed with success.

Table 3-2-3 Estimated revenue and expenditure (D 1,000)

Revenue		Expenditure		Remarks
Item	Amount	Item	Amount	
Proceeds of ice	1,935	Fuel oil	(1,293)	
Storage fee of chilled store	230	for ice-making machine	1,039	
Rental fee of refrigeration truck	648	for ice bin	54	
Rental fee of insulated bos	34	Labor cost	(137)	
Rental fee of fish box	101	Staff	108	
		Local workers	29	Parts for installed devices
		Maintenance cost	(792)	
		for machinery & devices	360	
		for maintenance parts	360	
		Business expenditure, travelling, etc	72	
Subtotal (A)	2,813	Subtotal (B)	2,022	
Revenue (A) – Expenditure (B) = 2,813 – 2,022 = 791				

Note: Depreciation of facilities and materials is not included.

Amount of each item is calculated as follows;

(A) Revenue

a. Proceeds of ice: D 1.935 million

For the diffusion purpose, the price of ice is settled at D 0.8/kg, cheaper than D 1.0/kg at the vicinity.

The production capacity is 10 ton/day, but, taking decreasing demand during the off season into consideration, an average selling of 8 ton/day and 10% melting loss during transportation due to the tropical climate are applied. Sales days are 28 days/month which fishing operations are carried out.

$$\text{Proceeds of ice} = 8 \text{ t/day} \times 28 \text{ days} \times D0.8/\text{kg} \times 0.9 \times 12 \text{ months} = D 1.935$$

b. Storage fee of chilled store: D 230 thousand

In accordance with the current fee, a fee of D 10 box/day is applied. The volume to be stored is determined to be 80% of the capacity of storage.

$$\text{Storage fee} = D10/\text{day} \times 80 \text{ boxes} \times 0.08 \times 12 \text{ months} = D 230 \text{ thousand}$$

c. Rental fee of refrigeration truck: D 648 thousand

In view of the purchase price of truck and its service life, a rental fee of D 1,000/day is determined. Fuel oil and the driver allowance shall be borne by a renter. From the viewpoint of operation distance, an operation schedule of 3 day operation plus one day off is applied. The annual operation efficiency is decided to be 80%.

$$\text{Rental fee of truck} = D1,000 \times 30 \text{ days} \times 3/4 \times 3 \text{ trucks} \times 12 \text{ months} \times 0.8 = D648 \text{ thousand}$$

d. Rental fee of insulated box: D 33 thousand

In view of the purchase price and its service life, D 100/month per box is applied.

$$\text{Rental fee of box} = D100/\text{month} \times 28 \text{ boxes} \times 12 \text{ months} = D 33 \text{ thousand}$$

e. Rental fee of fish box: D 101 thousand

For the purpose to promote the utilization of fish boxes, a cheaper rental fee of D1/box per day is established.

$$\text{Rental fee} = \text{D1/day} \times 400 \text{ boxes} \times 0.7(\text{utilization rate}) \times 30 \text{ days} \times 12 \text{ months} \\ = \text{D 101 thousand.}$$

(B) Expenditure

a. Fuel of for generator: D1,227 million for ice-making & D65 thousand for chilled store

Two sets of generator are in ordinary use. In view of electricity to be used, 95% and 5% of fuel oil cost are allocated for ice-making and chilled storage respectively.

$$11.5/\text{hr} \times 24 \text{ hr} \times 30 \text{ days} \times 2 \text{ sets} \times \text{D}6.5/\text{l} \times 12 \text{ months} = \text{D 1.292 million}$$

b. Labor cost: D 137 thousand

The wage schedule in the Gambia is applied to the staff and local workers. The personnel expenditure of the staff from the Fisheries Department is covered by the personnel budget of the Department.

$$\text{Staff} = \text{D}1,500 \times 6 \text{ persons} \times 12 \text{ months} = \text{D 108 thousand}$$

$$\text{Local workers} = \text{D 800} \times 3 \text{ persons} \times 12 \text{ months} = \text{D 29 thousand}$$

c. Maintenance cost

The service life of the machinery and devices is heavily influenced by usual maintenance. The Center facilities are subject to salt damage due to the vicinity of the sea, and hence a daily maintenance is essential. This cost covers the maintenance of the machinery, well, vehicles, etc., and partly is saved up.

$$\text{D 20,000/month} \times 12 \text{ months} = \text{D 240 thousand}$$

d. Parts

It takes about 3 months to get necessary parts from Japan. Some parts must be kept for emergency. The cost was decided based on the Bakau Project.

$$D\ 30,000/\text{month} \times 12\ \text{months} = D\ 360\ \text{thousand}$$

c. Business expenditure, travelling, and miscellaneous: D 60 thousand

As these expenditure D 5,000 per month is appropriated.

$$D\ 5,000/\text{month} \times 12\ \text{month} = D\ 60\ \text{thousand}$$

(C) Revenue and expenditure of FRP fishing boat (Excluding revenue of Tanji Management Committee)

FRP fishing boats are owned by Tanji Management Committee and used by the fishermen. The Management Committee sells the fishery catches and share 40% of the profits among the fishermen after deducted direct expense (fuel for outboard engine), and keeps 40% as utilization fee. The profit and part of Management Committee's revenue are laid aside for special fund. The fund is used for fishery development and the following purposes including purchase of FRP fishing boats.

Cost estimation for a FRP fishing boat/month

(Revenue) sales profits $20,000\text{kg} \times D0.7 = D14\text{thousand}$

(Expenditure) fuel oil $40\text{L} \times 20\ \text{operation} \times D5.5 = D4.4\ \text{thousand}$

Fishermen's share $(14\ \text{thousand} - 4.4\ \text{thousand}) \times 60\% = D5,760/\text{month}$

Management Committee fund $(14\ \text{thousand} - 4.4\ \text{thousand}) \times 40\% = D3,840/\text{month}$

Chapter 4

Project Evaluation and Recommendations

Chapter 4. Project Evaluation and Recommendations

4-1 Project Effect

The fishing industry of the Gambia is one of important national economy activities in that it is playing a major role to supply good animal protein to fish-preference people, to promote employment, and to obtain foreign money through an export of fish products. The sea off the west coast of the country is a good fishing ground abundant in pelagic fish and quality demersal fish. It is the most important industry next to agriculture in the resources-scauty country, having a high development possibility.

The fisheries development policies have been carried forward with economic assistance from FAO, EC (now EU), Italy, and Japan since 1980s.

Japan provided assistance in the development of coastal fisheries of Banjul in 1989 and the development of artisanal fisheries of Bakau in 1991/93. The Bakau Project aiming at increasing production and reducing post-harvest losses contributed greatly to fisheries development of the country, and has attracted broad attention as a model of artisal fisheries development project.

At other fishing villages, however, there is no preservation facilities such as ice-making plant and chilled store, and also a fish distribution system in the inland area has not been improved yet. As a result, large post-harvest losses and poor fish protein supply to the interior people remain as problems to be settled. To settle these problems an effective artisanal fisheries development plan including the provision of preservation facilities must be carried out as well as distribution equipment and materials must be provided.

Among them, at Tanji, the major landing site of Bonga which is most popular to the Gambia people, more than 30% of landings are discarded as post-harvest losses due to spoilage during transportation to the inland area in high fishing season when over 25 ton fish are landed, and quality demersal fish, byproducts of Bonga boats, lose their selling opportunity because of lack of ice-making and cold storage facilities. Also, at Brufut, Sanyang, and Batokunko, landing sites of demersal fish near Tanji, since it is difficult to keep freshness of quality demersal fish due to poor supply of ice, fish are sold at lower price or become unsuitable for export.

When the preservation facilities are provided at Tanji and distribution equipment and materials are improved under the Project, the following benefits can be expected.

- (1) When the chilled storage, which is intended for ice supply/storage to preserve fisheries' freshness is introduced under the Project, post-harvest loss of Bonga and other fishery catches at Tanji will be greatly reduced. Also, volume of fishery distribution from Tanji which is currently 2,800 tons a year is expected to rise remarkably.
- (2) When the chilled storage is introduced, demersal fish whose annual landings is currently 350 tons will be sent to distributors as it makes it possible to keep fish in good freshness till the catches from several boats reach an expected amount. That contributes to decrease of post-harvest loss of demersal fish and increase fishermen's income.
- (3) Though no facilities are provided at Brufut, Sanyang, and Batokunko, prompt supply of ice from Tanji will allow quality demersal fish to be sold at higher price or to prevent becoming unsuitable products for export.
- (4) Improvement in transportation and distribution through the provision of refrigeration trucks and sufficient ice will reduce post-harvest losses as well as increase the supply of cheaper and better fish protein to the inland area people.
- (5) Activation of fresh fish distribution through development of distribution methods will promote phased transition from smoke-dried to fresh fish distribution, which will help to preserve forest resources by reducing timber consumption for smoking. Also, partial introduction of FRP fishing boats for substitution of worn-out wooden ones will start the conversion from timber as a ship-building material.

When the Project is implemented, some 20 thousand population around Tanji including 2,000 fisheries-related people in this area will be directly benefited.

Furthermore indirect benefit through the improvement of distribution will cover some 200 thousand people in the inland area.

In view of these benefits it is judged that the construction of the Fishery Center and provision of distribution materials is of deep significance and appropriate as a Japan's Grant Aid Program.

4-2 Recommendations

After completion of the Project, it is necessary for the Gambia Government to address the following problems so that the newly-provided facilities, equipment and materials may be utilized effectively, fish distribution improved, and fisheries development program promoted more.

(1) Management of the Fishery Center

The Fishery Center of the Project contains various electric equipment never have been seen at Tanji before, which is essential to adequate resources including budget for management and maintenance. Also the key point of the management of the Center is collection of proper charges and fees, which must be determined after full discussion with producers and distributors.

The Center is to be managed by Tanji Management Committee having experience of management of the landing site here. The difference is the scale of the facility and amount of money to be handled. A monthly revenue of some D 2,000 will increase to D 200 thousand.

(2) Preparation of initial funds (subsidiaries of the Government)

Until the Project gets underway funds for fuel oil for the generator system and running the facilities are necessary. Also all of the machinery will require 2 to 3 month running in. At the Bakau Project it was possible to start the operation without subsidiaries of the Government because the payment for the public utility occurred after the facility started operation, and fishermen's advances for fishing boats/gear were usable as running funds.

The Tanji Project, however, is different in conditions. Assistance from the Government is necessary for the initial operation because required money makes no comparison with the Bakau Project. Some D 350 thousand (about Y 3.6 million) corresponding with some 2 months operation funds and its budget measure by Fishery Department will be essential.

(3) Replacement of equipment and materials

The replacement of vital parts of the ice-making/cold storage facility with 10-year useful life will cost some D 2 million (¥ 20 million rate: D 1=10.37 yen). Also the 10-year life refrigeration truck will cost D 1.6 million for 3 units. These necessary money must be put aside from profits estimated at D 790 thousand yearly.

(4) Consideration to corrosion and salt damages

The Bakau Project experienced salt damage beyond expectations. Although the Project selected carefully anticorrosive equipment and materials, people concerned must pay attention to protect the machinery against corrosion and salt damages. Daily cleaning of devices must be carried out.

(5) Fire control

Tanji saw a fire at the smoking hut for past 7 years. Special care must be paid against a fire, in particular at the smoking hut which is always using fire. The Project planned to construct the Fishery Center and the fuel tank 8 m and 40 m away respectively from the existing smoking hut; besides the fuel tank is to be laid under the ground. To make perfection more perfect, don't place wood for smoking except wood for present use inside the smoking hut. Again, use extreme care to prevent a fire.

(6) Special account/fund for FRP fishing boats and fishing gear

As a condition of procurement of FRP fishing boats and fishing gear, two thirds of FOB values of them must be deposited in a special Account/Fund within the period of four years from the date of Exchange of Notes (E/N). Fisheries Department and Tanji Management Committee are collectively responsible for the obligation.

Appendices

APPENDICES

1. Member List of the Study Team

1-1 Preliminary Study	A-1
1-2 Basic Design Study	A-2
1-3 Draft Basic Design Study	A-3

2. Survey Schedule

2-1 Preliminary Study	A-4
2-2 Basic Design Study	A-6
2-3 Draft Basic Design Study	A-9

3. List of Party Concerned in the Recipient Country

3-1 Preliminary Study	A-10
3-2 Basic Design Study	A-12
3-3 Draft Basic Design Study	A-13

4. Minutes of Discussion

4-1 Basic Design Study	A-14
4-2 Draft Basic Design Study	A-27

5. Result of Site Survey

5-1 Results of Plate Loading Test	A-37
5-2 Results of Pumping Test	A-39
5-3 Water Quality Results	A-44

6. List of Maintenance and Construction Tools

A-46

7. References

A-49

1. Member List of the Study Team

1-1 Preliminary Study

Mr. S. TORIKA	Leader	Deputy Director Office of Overseas Fisheries Cooperation, Fisheries Agency
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Mr. T. SHIMODA	Project Coordinator	Second Project Study Division, Grant Aid Project Study Department, JICA
Mr. S. YOSHIOKA	Fisheries Facility Planner	Planning and Survey Division, Grant Aid Management Department, Japan International Cooperation System (JICS)
Mr. H. MIYASHITA	Fisheries Market Planner/ Socio-Economic Surveyor	Planning and Survey Division, Grant Aid Management Department, Japan International Cooperation System (JICS)

1-2 Basic Design Study

Mr. S. TORIKA	Leader	Deputy Director Office of Overseas Fisheries Cooperation, Fisheries Agency
Mr. S. UMEMOTO	Project Coordinator	Staff JICA Senegal Office
Mr. K. SHIMAZU	Chief Consultant Fisheries Development	CRC Overseas Cooperation Inc.
Mr. K. MOTOKI	Fisheries Facility Planning	CRC Overseas Cooperation Inc.
Mr. T. SHOJI	Natural Condition Survey	CRC Overseas Cooperation Inc.
Mr. K. YAHARA	Construction Planning Cost Estimation	CRC Overseas Cooperation Inc.

1-3 Draft Basic Design Study

Mr. S. TORIKA	Leader	Deputy Director Office of Overseas Fisheries Cooperation, Fisheries Agency
Mr. S. UMEMOTO	Project Coordinator	Staff JICA Senegal Office
Mr. K. SHIMAZU	Chief Consultant Fisheries Development	CRC Overseas Cooperation Inc.
Mr. K. MOTOKI	Fisheries Facility Planning	CRC Overseas Cooperation Inc.

2. Survey Schedule

2-1 Preliminary Study

No of Date	Date (DD/MM/YY)		Schedule			Stay
			Katori	Iwamoto	Yoshioka	
			Shimoda		Miyashita	
1	22/07/99	Wed	Narita→Paris		Same as Katori/Shimoda	Paris
2	23/07/99	Thu	Paris→Banjul			Banjul
3	24/07/99	Fri	Courtesy call to Foreign Affairs Dept.; Trade, Industry & Employment Dept.; Agriculture Dept. Explanation to Fisheries Dept.	Narita→Paris		Banjul
4	25/07/98	Sat	Site survey at: • Banjul fish port • Bakau fish port • Tanji landing	Paris→Banjul		Banjul
5	26/07/98	Sun	Site survey: Gunjur landing, Banjul fish port, Bakau fish port, Tanji landing			Banjul
6	27/07/98	Mon	Discussion with Fisheries Dept.			Banjul
7	28/07/98	Tue	Discussion with Fisheries Dept. Tanji landing (interview)			Banjul
8	29/07/98	Wed	Discussion with Fisheries Dept. Data collection at Land & Survey Dept. Data collection at Statistics Dept.			Banjul
9	30/07/98	Thu	Fisheries Dept. (signing of minutes) Banjul→Dakar			Banjul /Dakar
10	31/07/98	Fri	Report to Japanese Embassy/JICA Dakar→		Data collection at Statistics Dept. Discussion with Fisheries Dept. Site survey at Bakau	Banjul /on board

No of Date	Date (DD/MM/YY)		Schedule			Stay
			Katori	Iwamoto	Yoshioka	
			Shimoda		Miyashita	
11	01/08/98	Sat	→Paris→			Banjul /on board
12	02/08/98	Sun	→Narita			Banjul /Narita
13	03/08/98	Mon	Questionnaire survey at Tanji landing; Data collection at Geological Unit/Oil data Center			Banjul
14	04/08/98	Tue	Report/discussion with Fisheries Dept.			Banjul
15	05/08/98	Wed	Market survey			Banjul
16	06/08/98	Thu	Discussion with TAF Const.; BACEM ltd.; Fisheries Dept.			Banjul
17	07/08/98	Fri	Discussion with Fisheries Dept.			Banjul
18	08/08/98	Sat	Documentation work			Banjul
19	09/08/98	Sun	Banjul→Dakar			Dakar
20	10/08/98	Mon	Report to Japanese Embassy/JICA Dakar→			on board
21	11/08/98	Tue	→Paris→			on board
22	12/08/98	Wed	→Narita			

2-2 Basic Design Study

No of Date	Date (DD/MM/YY)		Schedule		Stay
			Official (person)	Consultants (persons)	
			S.Torika	K.Shimazu, K.Motoki	
1	28/10/98	Wed	Narita→Paris		Paris
2	29/10/98	Thu	Paris→Banjul Internal meeting		Banjul
3	30/10/98	Fri	Courtesy call to Foreign Affairs Dept. & Fisheries Dept.; discussion with Fisheries Dept.		Banjul
4	31/10/98	Sat	Site survey & talks with community leaders at Tanji		Banjul
5	01/11/98	Sun	Market survey for urban area; Project survey at Bakau		Banjul
6	02/11/98	Mon	Discussion with Fisheries Dept.; survey on natural conditions (hereinafter (Na)); Discussions with Water Resources Dept.; sampling of underground water		Banjul
7	03/11/98	The	Discussion with Fisheries Dept.; (Na) at Tanji, surveying at Site		Dakar
8	04/11/98	Wed	Discussion with Fisheries Dept. on minutes/draft Signing of minutes, (Na) water quality survey at Site		
9	05/11/98	Thu	Banjur→Dakar	Continue survey; (Na) boring survey	Banjur /Dakar
10	06/11/98	Fri	Report to Japanese Embassy in Dakar →Dakar	Discussion with Fisheries Dept.; (Na) boring survey	on board/ Banjur

No of Date	Date (DD/MM/YY)		Schedule		Stay
			Official (person)	Consultants (persons)	
			S.Torika	K.Shimazu, K.Motoki	
11	07/11/98	Sat	->Paris->	Survey on Project facilities & equipment at Bakau	on board/ Banjul
12	08/11/98	Sun	->Narita	Site survey: Gunjur, Sanyang. Batokunku, Tanji	Banjul
13	09/11/98	Mon		Discussion with Fisheries dept.; cost estimation; (Na) discussion on cost estimation of water pumping test	Banjul
14	10/11/98	Tue		At Tanji: Community meeting, with Fisheries Director attending; (Na) board loading test	Banjul
15	01/11/98	Wed		Discussion with Fisheries Dept. Visit to Finance Dept., Fire Defense Dept.; (Na) water pumping test at Tanji	Banjul
16	12/11/98	Thu		Discussion with Fisheries Dept. (Na.) water pumping test at Tanji	Banjul
17	13/11/98	Fri		Discussion with Fisheries Dept., data collection, site survey: Brufut (Na.) unevenness survey at Tanji	Banjul
18	14/11/98	Sat		Verification of machinery/equipment at Bakau; (Na) unevenness survey at Site	Banjul
19	15/11/98	Sun		Project Manager & 2 Team members for natural conditions survey: documentation work Two Team members for construction & machinery: Banjul->Dakar	Banjul /Dakar
20	16/11/98	Mon		Discussion with Fisheries Dept.; Survey at planned market site; Survey at Tanji, (Na) surveying at Tanji Team members for construction & machinery: engage in cost estimation at Dakar till return home	Banjul /Dakar

21	17/11/98	Tue		Discussion with Fisheries Dept.; visit to oil company; (Na) surveying at Tanji	Banjul /Dakar
22	18/11/98	Wed		Discussion with Fisheries Dept.; survey at Tanji & Brufut; (Na) water pumping from wells around Site; simple water quality test	Banjul /Dakar
23	19/11/98	Thu		Two Team members: continue cost estimation survey at Dakar Two Team members: Banjul→Dakar	Dakar
24	20/11/98	Fri		Report to JICA/Japanese Embassy in Dakar; Dakar→	Dakar/ on board
25	21/11/98	Sat		→Paris→	On board
26	22/11/98	Sun		→Narita	

2-3 Draft Basic Design Study

No of Date	Date (DD/MM/YY)		Schedule		Stay
			Official (1 person)	Consultants (2 persons)	
			S.Torika	K.Shimazu, K.Motoki	
1	05/02/99	Fri	Narita→Paris		Paris
2	06/02/99	Sat	Paris→Banjul		Banjul
3	07/02/99	Sun	Supplementary Survey at Tanji		Banjul
4	08/02/99	Mon	Courtesy call to Foreign Affairs Dept./Office of the Secretary of State Discussion with the Fisheries Dept.		Banjul
5	09/02/99	Tue	Discussion with the Fisheries Dept. Supplementary survey on distribution system		Banjul
6	10/02/99	Wed	Discussion on draft/minutes with the Fisheries Dept. Supplementary survey on distribution system Signature on the minutes of meetings		Banjul
7	11/02/99	Thu	Banjul→Dakar		Dakar
8	12/02/99	Fri	Report to Japanese Embassy/JICA Dakar→		on board
9	13/02/99	Sat	Paris→		
10	14/02/99	sun	→Narita		

3. List of Party Concerned in the Recipient Country

3-1 Preliminary Study

Office of the Secretary of State The Presidency	Permanent Secretary, Department of State for Fisheries	Mr. Omax G. Sallah
	Deputy Permanent Secretary, Department of State for Fisheries	Mr. Tijan N. Jie
Department of State for Foreign Affairs	Permanent Secretary	Mr. William J. Joof
	Principal Assistant Secretary	Mr. Alhaji Omar Faal
	Protocol Officer	Mr. Kaba Saine
Department of State for Trade Industry & Employment	Secretary of State	Mr. Hon Dominic Mendy
Fisheries Department	Director of Fishery	Mr. Ousman K.L. Drammeh
	Principal Fisheries Officer	Mr. Famara Daboe
	Fisheries Officer (Japan's Project)	Mr. Peter Ndow
	Fisheries Officer (Inland)	Mr. Ousam Jobe
	Fisheries Officer	Mr. Asberr N. Mendy
	Fisheries Officer	Mr. Matarr Bah
	Fisheries Officer	Mr. Banba Banja
	Fisheries Officer	Mr. Sma Njeu
	Assistant Director	Mr. Nfamara J. Dampha
	Mechanical Superintendent	Mr. Sehousa Manjang
	Assistant Mechanical Superintendent	Mr. Abdoulie Njie
	Senior Fisheries Assistant	Mr. Filly Sanneh
	Principal Fisheries Assistant (Tanji)	Mr. Sakifu K. J. Bojang
Department of Land & Survey	Senior Photo-Lithographer	Mr. Alh. M. L. K janneh
	Petroleum Data Center	Mr. Yusupha Touray

General Statistics Department	General Account	Ms. Maimuna Bayo
Geological Unit	Chief Geologist	Mr. Wilham Whyte
Tanji Management Committee	Alkalo (Chief) of Tanji	Mr. Momodou Bojano
	President, Tanji Fisheries Committee	Mr. Nua Jameh
	Secretary, Tanji Fisheries Committee	Mr. Ansumana Marong
	Fisheries Field Assistant (Fisheries Dept.)	Mr. Babanding Kanyi
Bakau management Committee	Member, Representative of Fishermen	Mr. Ousman Bojang
	Member, Representative of Fishermen	Mr. Saikou Sakkah
TAF Houlding Co. Ltd.	Chairman & Chief Executive Officer	Mr. Mustapha Njie
GACEM Ltd.	General Manager	Mr. Alfonso Rodriguez

3-2 Basic Design Study

Republic of Gambia Department of State for Foreign Affairs	Deputy Permanent Secretary	Mrs. Fatou J. Jallow
Dept. of State for Presidential Affairs. Fisheries & Natural Resources	Permanent Secretary	Mr. Omar Sallah
Fisheries Department	Director	Mr. Ousman KI Drammeh
	Fisheries Officer	Mr. Peter Ndow
	Principal Fisheries Assistant	Mr. Ebow m. mbye
	Principal Fisheries Assistant (TANJI)	Mr. Salifu Bojang
	Fisheries Assistant (TANJI)	Mr. Babanding Kanyi
	Head refrigerator Engineer (BAKAU)	Mr. Bubacaru Jallow
	GUNJUR Fisheries Center	Mr. Ensa Touray
	Principal Fisheries Assistant (BRUFUT)	Mr. Janko Bojang
Tanji Management Committee	ALKALI of Tanji, Chairman of CMC	Mr. Momodou MB. Bojang
Dep. of Water Resources	Project Coordinator RWSSP Principal Hydrologist	Mr. Basiru Ceesay Mr. Ansumana Manneh
ELF Oil Gambia Limited	Operations Manager	Mr. Amadou Salieu N'jie
National Water and Electricity Company LTD.	Managing Director	Mr. Batchi Baldeh
The Republic of Senegal The Japanese Embassy in Senegal JICA Senegal Office	Second Secretary Director Deputy Director Assistant Director	Mr. Atsushi Suzuki Mr. Tsuneo Tsukada Mr. Itaru Hamakawa Mr. Shinji Umemoto
Nissaku Co. Ltd.	Assit. to Enterprises Division Manager	Mr. Katsumi Inoue

3-3 Draft Basic Design Study

The Republic of the Gambia Department of State for Foreign Affairs	Deputy Permanent Secretary	Mrs. Fatou J. Jallow
Dept. of State for Presidential Affairs. Fisheries & Natural Resources	Permanent Secretary	Mr. Omar Sallah
Fisheries Department	Director	Mr. Ousman KI. Drammeh
	Fisheries Officer	Mr. Peter Ndow
	Principal Fisheries Assistant	Mr. Ebow m. mbye
	Principal Fisheries Assistant (TANJI)	Mr. Salifu Bojang
Dep. of Water Resources	Principal Hydrologist	Mr. Ansumana Manneh
The Republic of Senegal The Japanese Embassy in Senegal JICA Senegal Office	Third Secretary Director Deputy Director Assistant Director	Mr. Noya Ikeda Mr. Tsuneco Tsukada Mr. Itaru Hamakawa Mr. Shinji Umemoto

4. Minutes of Discussion

4-1 Basic Design Study MINUTES OF DISCUSSIONS
ON
THE BASIC DESIGN STUDY ON THE PROJECT FOR
IMPROVEMENT OF FISHING AND PRESERVATION FACILITIES
FOR INLAND FISH DISTRIBUTION
IN
THE REPUBLIC OF THE GAMBIA

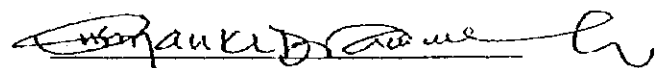
In response to a request from the Government of The Gambia, the Government of Japan has decided to conduct a Basic Design Study (hereinafter referred to as "the Study") on the Project for Improvement of Fishing and Preservation Facilities for Inland Fish Distribution in the Republic of The Gambia (hereinafter referred to as "the Project"), and entrusted the Study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to The Gambia a Basic Design Study Team (hereinafter referred to as "the Team"), which is headed by Satoshi Torika, Deputy Director, Office of Overseas Fisheries Cooperation, Fisheries Agency, and is scheduled to stay in the country from October 29, 1998 to November 19, 1998. The Team held discussions with the officials concerned of the Government of The Gambia and conducted field surveys at the study area.

In the course of discussions and field surveys, both parties have confirmed the main items described on the attached sheet. The Team will proceed to conduct further works and prepare the Basic Design Study Report.

Banjul, November 4, 1998


Mr. Satoshi Torika
Leader
Basic Design Study Team
Japan International Cooperation Agency


Mr. Ousman K.L. Drammeh
Director of Fisheries
Fisheries Department
Department of State for Presidential
Affairs, Fisheries & Natural Resources

ATTACHMENT

1. Objective of the Project

The objective of the Project is to construct fishery facilities and to provide equipment for improvement of fresh fish distribution in the Republic of The Gambia.

2. Project Site

The fishing base in Tanji, shown in ANNEX-1, is a site of the Project.

3. Responsible Agency and Implementing Agency

The Fisheries Department of The Department of State for Presidential Affairs, Fisheries and Natural Resources is the Responsible and Implementing Agency of the Project. Its organization chart is shown in ANNEX-2

4. Items requested by the Government of The Gambia

Fishery facilities and equipment requested by the Government of The Gambia are listed in ANNEX-3. However, construction of those facilities and provision of the equipment are subject to further studies by the Team.

5. Japan's Grant Aid System

- 1) The Government of The Gambia has understood the system of Japan's Grant Aid described in ANNEX-4 and explained by the Team.
- 2) The Government of The Gambia will take the necessary measures described in ANNEX-5 for smooth implementation of the Project on condition that the Grant Aid from the Government of Japan is extended to the Project.

6. Further Schedule of the Study

The Team will continue to carry out further studies in The Gambia until November 19, 1998.

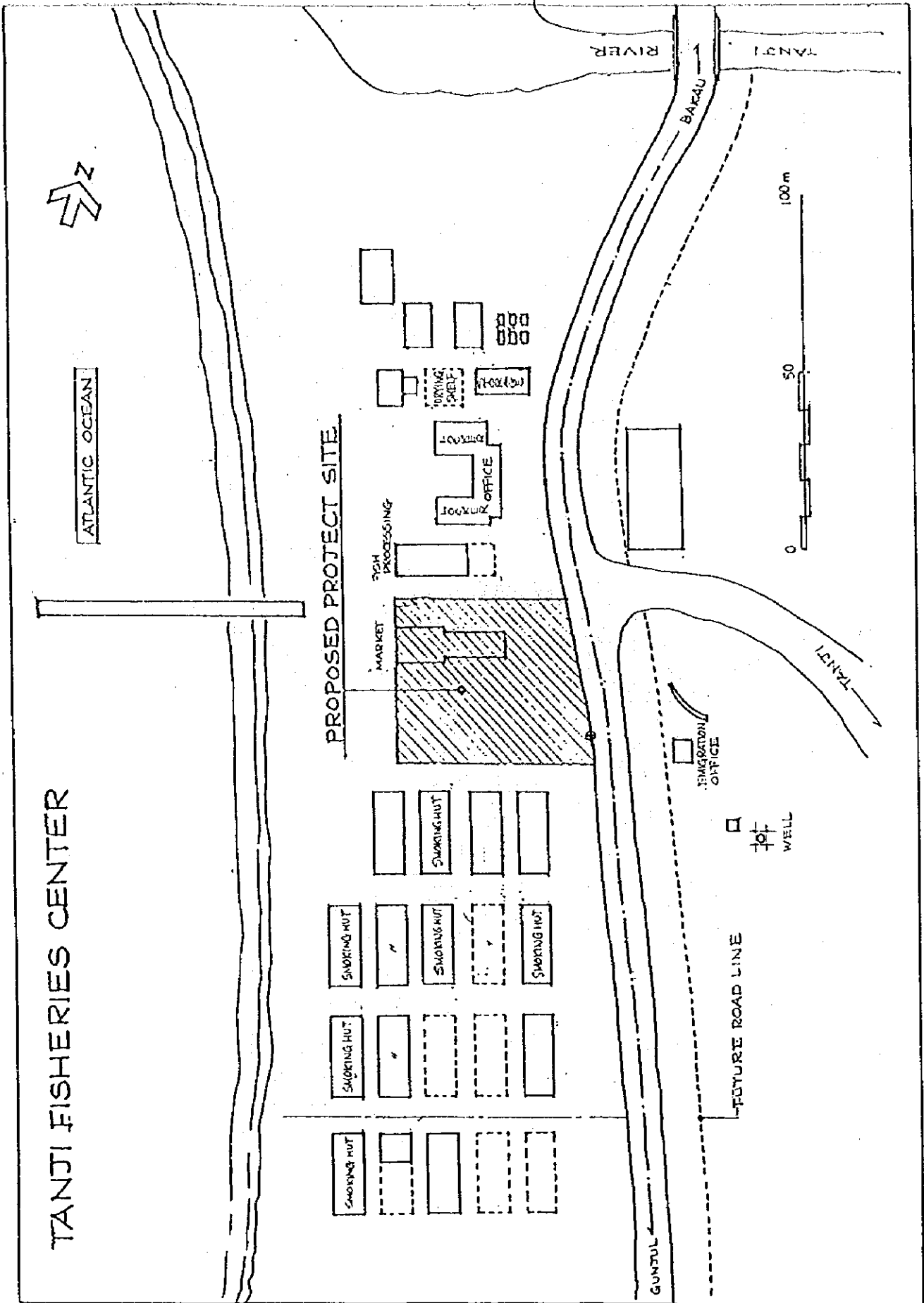
- 1) JICA will prepare a draft report in English and dispatch a mission to The Gambia in order to explain its contents in January 1999.
- 2) In case that the contents of the report are accepted in principle by the Government of The Gambia, JICA will complete the final report and send it to the Government of The Gambia around March 1999.

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7. Other Relevant Issues

- 1) The Gambian side made reference to the importance of receiving Japanese Technical Assistance to support the implementation of the Tanji Project as well as to consolidate the achievements of the JICA Training programme.
- 2) Additionally, the Gambian side outlined the Government National Fisheries Development Plan in which the major coastal fishing villages of Bakau, Tanji and Gunjul are reserved exclusively for Japanese assistance.
- 3) In regard to the request for FRP boats and fishing gears, the Team explained that it would be difficult to realize it in light of the Grant Aid principle of the Japanese Government.

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TANJI FISHERIES CENTER

ATLANTIC OCEAN



PROPOSED PROJECT SITE

SMOKING HUT

SMOKING HUT

SMOKING HUT

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MARKET

FISH PROCESSING

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ICEHOUSE OFFICE

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ICEHOUSE OFFICE

ICEHOUSE OFFICE

ICEHOUSE OFFICE

ICEHOUSE OFFICE

ICEHOUSE OFFICE

TANJI RIVER

GUNTUL RIVER

IMMIGRATION OFFICE

WELL

FUTURE ROAD LINE

100 m

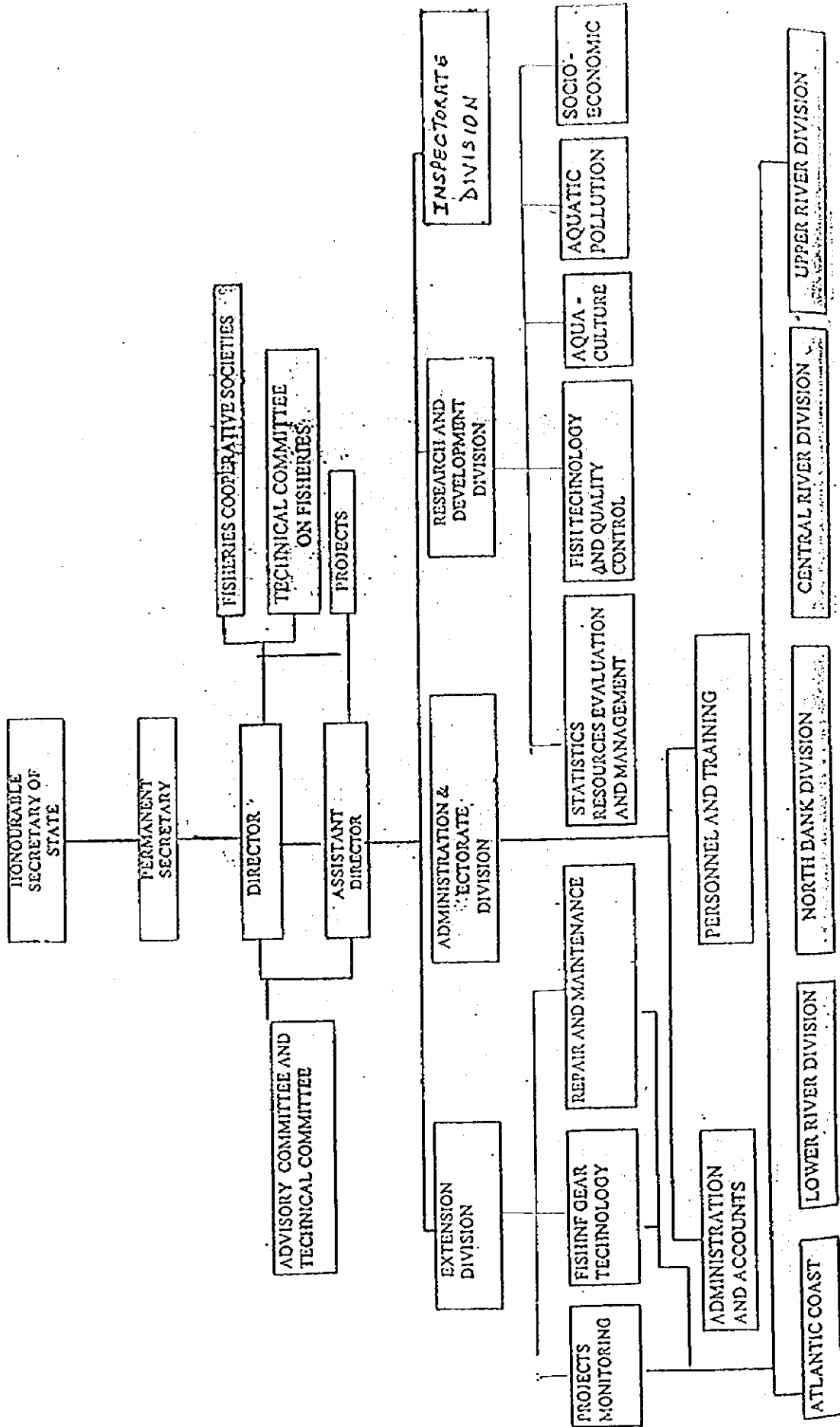
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Figure 4. Organization Chart of the Fisheries Department



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ANNEX-3 ITEMS REQUESTED BY THE GOVERNMENT OF THE GAMBIA

The following facilities and equipment are requested to be provided at the fishing base in Tanji.

Building Structure	(340 m ²)
Ice Making Plants	(5.0 ton x 3)
Ice Storage	(30 ton x 1)
Chilled Storage	(25 ton x 1, Separated Type)
Generators with Shed	(95 KVA x3)
Water Tank	(30 m ³)
Fuel Tanks	(5,000 l x 1, 10,000 l x 1)
Septic Tank	
Workshop with Maintenance Tools	
13 m FRP Fishing Boats and Fishing Gears	(16 units)
Refrigerator Vans	(5 ton x 4)
Fish Boxes	(500 each)
Insulated Fish Boxes	(50 each)

However, construction of above facilities and provision of the equipment, including selection of their numbers and specifications, are subject to further studies by the Team.

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1. Grant Aid Procedures

- 1) Japan's Grant Aid System is executed through the following procedures.

Application (Request made by a recipient country)

Study (Basic Design Study conducted by JICA)

Appraisal & Approval (Appraisal by the Government of Japan and
Approval by the Japanese Cabinet)

Determination of Implementation (The Notes exchanged between the
Governments of Japan and the recipient country)

- 2) Firstly, a request for the Grant Aid submitted by a recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for the Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA to conduct a study on the request.

Secondly, JICA conducts the study (Basic Design Study), using a Japanese consulting firm.

Thirdly, the Government of Japan appraises the project so as to see whether or not it is suitable for the Grant Aid, basing on the Basic Design Study report prepared by JICA, and then it is submitted to the Cabinet for approval.

Fourthly, once the project is approved by the Cabinet, its implementation is officially determined by signing the Exchange of Notes between the Governments of Japan and of the recipient country.

Finally, in the course of implementation of the project, JICA will take charge of expediting the execution of the project by assisting the recipient country in such matters as preparing tenders, contracts and so on.

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2. Basic Design Study

1) Contents of the Study

The aim of the Basic Design Study, conducted by JICA on the requested project, is to provide basic documents necessary for the appraisal of the project by the Government of Japan. The contents of the study are as follows:

- a) to confirm the background, objectives and benefits of the project and also institutional capacity of the agencies concerned of the recipient country necessary for the project implementation;
- b) to evaluate the appropriateness of the project from the technical, social and economic points of view;
- c) to confirm items agreed on by both parties concerning the basic concept of the project;
- d) to prepare a basic design of the project; and,
- e) to estimate costs of the project.

The contents of the original request are not necessarily approved in their initial form as the contents of the Grant Aid project. The Basic Design of the project is confirmed considering the guidelines of Japan's Grant Aid Scheme.

The Government of Japan requests the Government of the recipient country to take whatever measures are necessary to ensure its self-reliance in the implementation of the project. Such measures must be guaranteed even through they may fall outside of the jurisdiction of the organization in the recipient country actually implementing the project. Therefore, the implementation of the project is confirmed by all relevant organizations of the recipient country in the Minutes of Discussions.

2) Selection of Consultants

For the smooth implementation of the study, JICA selects a consultant among those who registered at JICA by evaluating competitive proposals submitted by those consultants. The selected consultant carries out the Basic Design Study and prepare a report based on the terms of reference made by JICA.

At the beginning of the implementation after the Exchange of Notes, JICA recommends the same consultant who participate in the Basic Design Study to the recipient country for the services of Detailed Design and construction supervision of the project in order to maintain the technical consistency between the Basic Design and the Detailed Design.

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3. Japan's Grant Aid Scheme

1) What is the Grant Aid?

The Grant Aid Program provides a recipient country with non-reimbursable funds to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for economic and social development of the country under principles in accordance with the relevant laws and regulations of Japan. Grant Aid is not supplied through the donation of materials as such.

2) Exchange of Notes (E/N)

Japan's Grant Aid is extended in accordance with the Notes exchanged by the two Governments concerned, in which the objectives of the project, period of execution, conditions and amount of the Grant Aid, etc., are confirmed.

3) Period

The period of the Grant Aid means the one fiscal year which the Cabinet approves the project for. Within the fiscal year, all procedure such as exchanging of the Notes, concluding contracts with consulting firms and contractors and final payment to them must be completed. However, in case of delays in delivery, installation or construction due to unforeseen factors such as weather, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between the two Governments.

4) Purchase of Products and Services

Under the Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. When the two Governments deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country. However, the prime contractors, namely consulting, contracting or procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means persons of Japanese nationality or Japanese corporations controlled by persons of Japanese nationality.)

5) Necessity of Verification

The Government of the recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by the Government of Japan. This verification is deemed necessary to secure accountability to Japanese

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taxpayers.

6) Undertakings required to the Government of the recipient country

In the implementation of the Grant Aid project, the recipient country is required to undertake such necessary measures as the following:

(1) to secure land necessary for the sites of the project prior to commencement of the construction;

(2) to provide facilities for distribution of electricity, water supply and drainage and other incidental facilities outside the site;

(3) to secure buildings prior to the procurement in case the installation of the equipment;

(4) to ensure tax exemption and prompt execution for unloading, customs clearance at the ports of disembarkation and internal transportation of the products purchased under the Grant Aid;

(5) to exempt Japanese nationals from customs duties, internal taxes and other duties which will be imposed in the recipient country with respect to the supply of the products and services under the Verified Contracts;

(6) to accord Japanese nationals whose services may be required in connection with the supply of the products and services under the Verified Contracts, such as facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their works.

7) Proper Use

The recipient country is required to maintain and use the facilities constructed and equipment purchased under the Grant Aid properly and effectively and to assign the necessary staff for this operation and maintenance of them as well as to bear all the expenses other than those covered by the Grant Aid.

8) Re-export

The products purchased under the Grant Aid shall not be re-exported from the recipient country.

9) Banking Arrangement (B/A)

a) The Government of the recipient country or its designated authority shall open an account in the name of the Government of the recipient country in

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a Japanese bank (hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant Aid by making payments to the Bank in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.

- b) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an authorization to pay issued by the Government of recipient country or its designated authority.

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ANNEX-5 UNDERTAKINGS REQUIRED OF THE GOVERNMENT OF THE GAMBIA

In addition to the undertakings mentioned in the section 3. 6) of ANNEX-4, following necessary measures shall be taken by the Government of The Gambia on condition that the Grant Aid by the Government of Japan is extended to the Project.

1. to bear commissions to a Japanese bank for its banking services based upon the Banking Arrangement, namely the advising commission of the "Authorization to Pay" and other payment commissions
2. to provide necessary permissions, licenses and other authorizations for implementing the Project
3. to bear all the expenses other than those covered by the Grant Aid, necessary for the Project.

S. T.

MINUTES OF DISCUSSIONS
ON
THE BASIC DESIGN STUDY ON THE PROJECT FOR
IMPROVEMENT OF FISHING AND PRESERVATION FACILITIES
FOR INLAND FISH DISTRIBUTION
IN
THE REPUBLIC OF THE GAMBIA
(Consultation on the Draft Basic Design)


The Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched to the Republic of The Gambia the Basic Design Study Team on the project for Improvement of Fishing Preservation Facilities for Inland Fish Distribution in the Republic of the Gambia (hereinafter referred to as "the Project") in October to November 1998. As a result of the series of discussions, field surveys in The Gambia and technical examination in Japan, JICA prepared the Draft Basic Design on the Project.

In order to explain and discuss with the Government of The Gambia the component of the Draft Basic Design, JICA sent to The Gambia the Draft Basic Design Explanation Team (hereinafter referred to as "the Draft Team"), which is headed by Mr. Satoshi Torika, Deputy Director, Office of Overseas Fisheries Cooperation, Fisheries Agency and is scheduled to stay in the country from February 6 to 12, 1999.

As a result of discussions, both parties confirmed the main items described on the attached sheets.

Banjul, February 10, 1999


Mr. Satoshi Torika
Leader
Draft Basic Design Explanation Team
Japan International Cooperation Agency


Mr. Ousman K.L. Drammeh
Director of Fisheries Department
Department of State for Presidential
Affairs, Fisheries and Natural
Resources

S.T.

ATTACHMENT

1. Major Component of the Draft Basic Design

The Government of The Gambia has agreed and accepted in principle the following major components of the Draft Basic Design proposed by the Draft Team.

Building Structure with Fish Handling Place,	
Ice Making Plant (5 ton/day x 2),	Ice Storage (20 ton x 1),
Chilled Storage (4 ton x 1),	Generators (75 KVA x 3)
Maintenance Room and Store(24 m ²),	Toilet and Shower (1 unit)
Water Tanks with Pipelines(5m ³ x 1, 15m ³ x 1),	Fuel Tank (10,000l x 2)
Deep Well with Underwater Pump(1 set),	Septic Tank,
Huts for Pump and Control Panel (2 units),	Gabions
Refrigerator Vans (5 ton type x 3),	Insulated Fish Boxes (28 boxes)
Fish Boxes (400 boxes),	Maintenance Equipment

2. Responsible Agency and Implementing Agency

Department of State for Presidential Affairs, Fisheries and Natural Resources is the Responsible Agency and Implementing Agency of the Project.

3. Management and Maintenance

Department of State for Presidential Affairs, Fisheries and Natural Resources will maintain and use properly the facilities constructed under the Project and assign the necessary staff and budget for operation and maintenance of them.

4. Japan's Grant Aid System

- 1) The Government of The Gambia has understood the system of Japan's Grant Aid program described in ANNEX-1 and explained by the Draft Team.
- 2) The Government of The Gambia will take the necessary measures described in ANNEX-2 for smooth implementation of the Project on the condition that the Grant Aid from the Government of Japan is extended to the Project.

5. Further Schedule of the Study

The Draft Team will make the Final Report in accordance with the confirmed items and send it to the Government of The Gambia in June or August 1999 according to the schedule of the Japanese cabinet approval.

6. Other Relevant Issues

- 1) The provision of 5 FRP boats and their fishing gears is subject to further discussion among officials of the Government of Japan.

- 2) The Government of The Gambia requested again to include 10 FRP boats and their fishing gears in the Project. But the Government of The Gambia, desirous of continued fruitful cooperation with the Government of Japan, reluctantly agreed to accept the Project if FRP boats are not included because the inclusion of the FRP boats make this Project more effective and productive.

The Government of The Gambia also expressed the desire that consideration be given to include a drainage system so as to protect the Centre. It is also a recognized need to include pavement works to create additional processing space to adequately accommodate the present number of processors and also the anticipated increase in the number of processors and dealers when the Project starts.

Furthermore, the Project administrators will require office accommodation separate and distinct from the main building.

- 3) The Japanese mission explained that in order for the FRP boats to be included in the Project, the Government of The Gambia must agree to satisfy the condition of the Government of Japan that two-thirds (2/3) of the F.O.B. values of the FRP boats be deposited in a special Account/ Fund within the period of four years from the date of Exchange of Notes (E/N). The Government of The Gambia accepts this condition.

- 4) The FRP boats to be supplied will be the legal authority of the community of Tanji represented by the Project Management Committee.

The fishermen who will be working on the FRP boats (9 fishermen per boat) will be selected by the Project Management Committee and the criteria for selection are as follows:

- the fisherman must be a Gambian
- the fisherman must be a citizen of Tanji village
- he must be a recognized fisherman
- he must be of exemplary character

The staff of the Fisheries Department assigned to the Project will be responsible for the maintenance and repair of the FRP boats. The management of the FRP boats will be the responsibility of the Project Management Committee working under the advice and guidance of the Fisheries Department.

The fishermen working on the FRP boats are paid monthly based on a very simple formula: Following the deduction of expenditure from total proceeds (sale of fish) , The fishermen are paid 60 percent and the Project retains 40 percent which is deposited in the Project Bank Account.

- 5) The Government of The Gambia has approved the importation of premixed fuel (for artisanal fishery operations) from Senegal at duty free price of Dalasis 5.50 per liter. In the case of the Tanji Project, the Project Management Committee will have sole responsibility to order and market fuel at the Project site, at duty-free price(s).

ANNEX-1 JAPAN'S GRANT AID SYSTEM

1. Grant Aid Procedures

- 1) Japan's Grant Aid System is executed through the following procedures.

Application (Request made by a recipient country)

Study (Basic Design Study conducted by JICA)

Appraisal & Approval (Appraisal by the Government of Japan and
Approval by the Japanese Cabinet)

Determination of Implementation (The Notes exchanged between the
Governments of Japan and the recipient country)

- 2) Firstly, a request for the Grant Aid submitted by a recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for the Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA to conduct a study on the request.

Secondly, JICA conducts the study (Basic Design Study), using a Japanese consulting firm.

Thirdly, the Government of Japan appraises the project so as to see whether or not it is suitable for the Grant Aid, basing on the Basic Design Study report prepared by JICA, and then it is submitted to the Cabinet for approval.

Fourthly, once the project is approved by the Cabinet, its implementation is officially determined by signing the Exchange of Notes between the Governments of Japan and of the recipient country.

Finally, in the course of implementation of the project, JICA will take charge of expediting the execution of the project by assisting the recipient country in such matters as preparing tenders, contracts and so on.

S.T.

2. Basic Design Study

1) Contents of the Study

The aim of the Basic Design Study, conducted by JICA on the requested project, is to provide basic documents necessary for the appraisal of the project by the Government of Japan. The contents of the study are as follows:

- a) to confirm the background, objectives and benefits of the project and also institutional capacity of the agencies concerned of the recipient country necessary for the project implementation;
- b) to evaluate the appropriateness of the project from the technical, social and economic points of view;
- c) to confirm items agreed on by both parties concerning the basic concept of the project;
- d) to prepare a basic design of the project; and,
- e) to estimate costs of the project.

The contents of the original request are not necessarily approved in their initial form as the contents of the Grant Aid project. The Basic Design of the project is confirmed considering the guidelines of Japan's Grant Aid Scheme.

The Government of Japan requests the Government of the recipient country to take whatever measures are necessary to ensure its self-reliance in the implementation of the project. Such measures must be guaranteed even through they may fall outside of the jurisdiction of the organization in the recipient country actually implementing the project. Therefore, the implementation of the project is confirmed by all relevant organizations of the recipient country in the Minutes of Discussions.

2) Selection of Consultants

For the smooth implementation of the study, JICA selects a consultant among those who registered at JICA by evaluating competitive proposals submitted by those consultants. The selected consultant carries out the Basic Design Study and prepare a report based on the terms of reference made by JICA.

At the beginning of the implementation after the Exchange of Notes, JICA recommends the same consultant who participate in the Basic Design Study to the recipient country for the services of Detailed Design and construction supervision of the project in order to maintain the technical consistency between the Basic Design and the Detailed Design.

S, T.

ETLD 1

3. Japan's Grant Aid Scheme

1) What is the Grant Aid?

The Grant Aid Program provides a recipient country with non-reimbursable funds to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for economic and social development of the country under principles in accordance with the relevant laws and regulations of Japan. Grant Aid is not supplied through the donation of materials as such.

2) Exchange of Notes (E/N)

Japan's Grant Aid is extended in accordance with the Notes exchanged by the two Governments concerned, in which the objectives of the project, period of execution, conditions and amount of the Grant Aid, etc., are confirmed.

3) Period

The period of the Grant Aid means the one fiscal year which the Cabinet approves the project for. Within the fiscal year, all procedure such as exchanging of the Notes, concluding contracts with consulting firms and contractors and final payment to them must be completed. However, in case of delays in delivery, installation or construction due to unforeseen factors such as weather, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between the two Governments.

4) Purchase of Products and Services

Under the Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. When the two Governments deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country. However, the prime contractors, namely consulting, contracting or procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means persons of Japanese nationality or Japanese corporations controlled by persons of Japanese nationality.)

S.T.

5) Necessity of Verification

The Government of the recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by the Government of Japan. This verification is deemed necessary to secure accountability to Japanese taxpayers.

6) Undertakings required to the Government of the recipient country

In the implementation of the Grant Aid project, the recipient country is required to undertake such necessary measures as the following:

- (1) to secure land necessary for the sites of the project prior to commencement of the construction;
- (2) to secure buildings prior to the procurement in case the installation of the equipment;
- (3) to ensure tax exemption and prompt execution for unloading, customs clearance at the ports of disembarkation and internal transportation of the products purchased under the Grant Aid;
- (4) to exempt Japanese nationals from customs duties, internal taxes and other duties which will be imposed in the recipient country with respect to the supply of the products and services under the Verified Contracts;
- (5) to accord Japanese nationals whose services may be required in connection with the supply of the products and services under the Verified Contracts, such as facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their works.

7) Proper Use

The recipient country is required to maintain and use the facilities constructed and equipment purchased under the Grant Aid properly and effectively and to assign the necessary staff for this operation and maintenance of them as well as to bear all the expenses other than those covered by the Grant Aid.

S. T.

8) Re-export

The products purchased under the Grant Aid shall not be re-exported from the recipient country.

9) Banking Arrangement (B/A)

a) The Government of the recipient country or its designated authority shall open an account in the name of the Government of the recipient country in a Japanese bank (hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant Aid by making payments to the Bank in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.

b) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an authorization to pay issued by the Government of recipient country or its designated authority.

§ 7

ANNEX-2 UNDERTAKINGS REQUIRED OF THE GOVERNMENT OF THE GAMBIA

In addition to the undertakings mentioned in the section 3. 6) of ANNEX-4, following necessary measures shall be taken by the Government of The Gambia on condition that the Grant Aid by the Government of Japan is extended to the Project.

1. to remove all structures located at the area of construction and to level the area.
2. to allocate initial budget without delay necessary for start of the Project such as for the purchase of diesel and gasoline.
3. to bear commissions to a Japanese bank for its banking services based upon the Banking Arrangement, namely the advising commission of the "Authorization to Pay" and other payment commissions.
4. to provide necessary permissions, licenses and other authorizations for implementing the Project.
5. to bear all the expenses other than those covered by the Grant Aid, necessary for the Project.

S. T.

5. Result of Site Survey

5-1 Results of Plate Loading Test

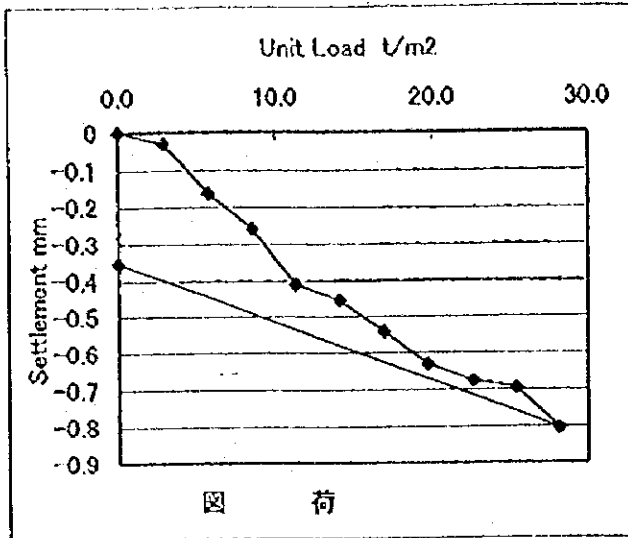
5-2 Result of Pumping Test

5-3 Water Quality Results

5-1 Results of Plate Loading Test

Table Results of Plate Loading Test

Load t	Unit Load (t/m ²)	Time	NO.1 Dial Guage	Sttelment (mm)	NO.2 Dial Guage	Sttelment (mm)	Average(m m)
			526		935		
0.2	2.86	12:20	522	-0.04	934	-0.01	-0.03
		12:21	522	-0.04	933	-0.02	-0.03
		12:22	522	-0.04	933	-0.02	-0.03
0.4	5.71	12:23	512	-0.14	923	-0.12	-0.13
		12:24	509	-0.17	920	-0.15	-0.16
		12:25	508	-0.18	920	-0.15	-0.17
0.6	8.57	12:26	500	-0.26	912	-0.23	-0.25
		12:27	498	-0.28	911	-0.24	-0.26
		12:28	498	-0.28	911	-0.24	-0.26
0.8	11.43	12:29	489	-0.37	903	-0.32	-0.35
		12:30	486	-0.40	901	-0.34	-0.37
		12:31	482	-0.44	897	-0.38	-0.41
1.0	14.29	12:32	478	-0.48	895	-0.40	-0.44
		12:33	477	-0.49	894	-0.41	-0.45
		12:34	476	-0.50	894	-0.41	-0.46
1.2	17.14	12:35	470	-0.56	889	-0.46	-0.51
		12:36	467	-0.59	887	-0.48	-0.54
		12:37	466	-0.60	887	-0.48	-0.54
1.4	20.00	12:38	462	-0.64	886	-0.49	-0.57
		12:39	457	-0.69	881	-0.54	-0.62
		12:40	454	-0.72	881	-0.54	-0.63
1.6	22.86	12:41	454	-0.72	879	-0.56	-0.64
		12:42	452	-0.74	877	-0.58	-0.66
		12:43	450	-0.76	876	-0.59	-0.68
1.8	25.71	12:44	456	-0.70	872	-0.63	-0.67
		12:45	455	-0.71	869	-0.66	-0.69
		12:46	453	-0.73	869	-0.66	-0.70
2.0	28.57	12:47	439	-0.87	865	-0.70	-0.79
		12:48	437	-0.89	864	-0.71	-0.80
		12:49	436	-0.90	864	-0.71	-0.81
0	0.00	12:50	479	-0.47	909	-0.28	-0.37
			480	-0.46	910	-0.25	-0.36



Remark

1. Load-settlement curve indicates that the settlement by design load $5 t/m^2$ is $0.2 mm$ only and original ground is practically incompressible in the condition.

2. Maximum load applied $28 t/m^2$ causes only $0.8 mm$ settlement which verifies the ground is very stiff.

3. Time-settlement curves show that no creep, tendency of time-dependant settlement, is detected.

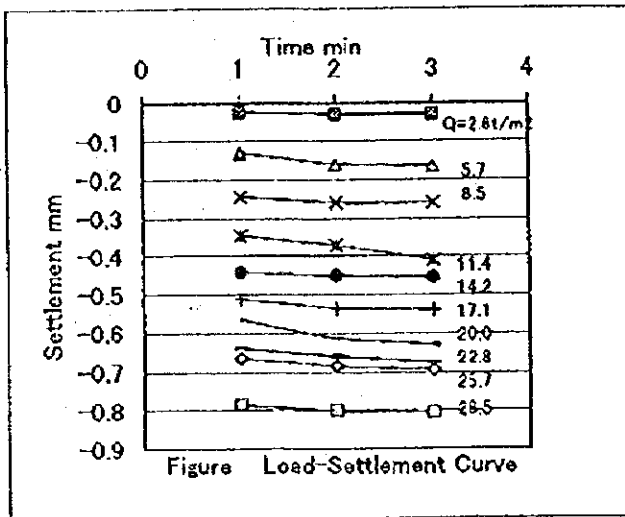


Figure Result of Plate Loading Test

5-2 Result of Pumping Test

Table Result of Pumping Test(Variable Head)

Time	Time Elapsed min	Discharge Rate m ³ /hr	Depth m	Fluctuation m
10:35	0	9.6	6.16	0.00
	0.5	9.6	6.20	-0.04
	1	9.6	6.22	-0.06
	1.5	9.6	6.24	-0.08
	2	9.6	6.30	-0.14
	2.5	9.6	6.34	-0.18
	3	9.6	6.37	-0.21
	3.5	9.6	6.43	-0.27
	4	9.6	6.49	-0.33
	4.5	9.6	6.60	-0.44
	5	9.6	6.67	-0.51
	6	9.6	6.90	-0.74
	7	9.6	7.00	-0.84
	8	9.6	7.08	-0.92
	9	9.6	7.16	-1.00
	10	9.6	7.20	-1.04
	15	9.6	7.55	-1.39
	20	9.6	8.00	-1.84
	25	9.6	8.31	-2.15
	30	0	8.31	-2.15
	30.5	0	8.31	-2.15
	31	0	8.22	-2.06
	31.5	0	8.18	-2.02
	32	0	8.14	-1.98
	32.5	0	8.09	-1.93
	33	0	8.05	-1.89
	33.5	0	8.00	-1.84
	34	0	7.98	-1.82
	34.5	0	7.88	-1.70
	35	0	7.75	-1.59
	36	0	7.65	-1.49
	37	0	7.65	-1.49
	38	0	7.55	-1.39
	39	0	7.45	-1.29
	40	0	7.40	-1.24
	45	0	7.25	-1.09
	50	0	7.05	-0.89
	55	0	6.95	-0.79
	60	0	6.82	-0.66
	70	0	6.55	-0.39
	80	0	6.50	-0.34
	90	0	6.47	-0.31
	120	0	6.40	-0.24
	150	0	6.36	-0.20
	210	0	6.36	-0.20
	270	0	6.37	-0.21
	330	0	6.38	-0.22
	390	0	6.37	-0.21

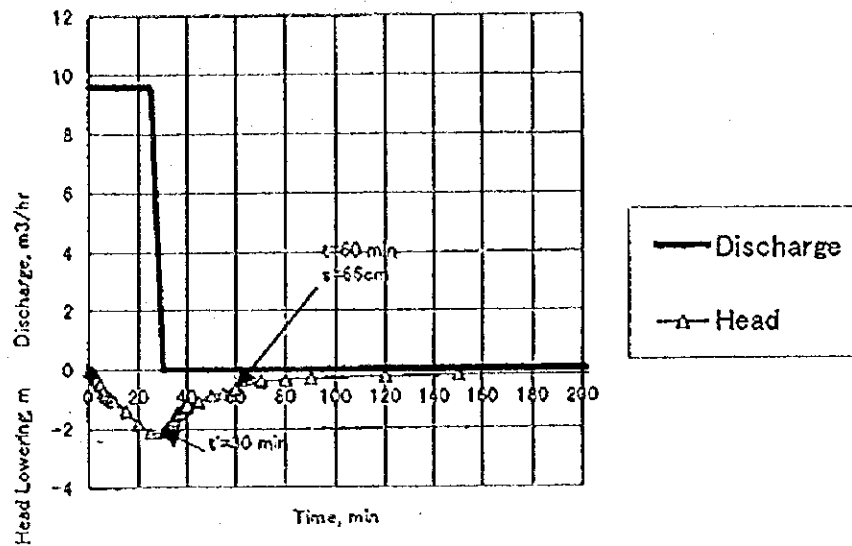


Figure Permeability Test, Variable Head

Estimation of Thickness of Aquifer

$$H = \frac{2.3 \times Q}{4\pi ks} \text{Log}_{10} \frac{t}{t'}$$

$$= \frac{2.3 \times 9.5 \times 10^6 / 3,600}{4 \times 3.14 \times 0.17 \times 66} \text{Log}_{10} \frac{60}{30}$$

$$= 13 \text{ cm}$$

Where:

- H : thickness of aquifer, m
- Q: discharge 9.5 t/hr
- k: permeability, 0.17cm/sec
- s: change of water head 66cm
- t: elapsed time, 60min
- t': elapsed time until stopping of pump: 30min

Comment 1

Aquifer thickness $H=13 \text{ cm}$
 Permeability Coef. $k=0.17\text{cm}/\text{sec}$
 Well Diameter $D=200\text{cm}$

Following can be obtained;

$$Q = \pi D \times H \times k = 3.14 \times 200 \times 13 \times 0.17 = 1,380 \text{cm}^3/\text{sec}$$

$$= 4 \text{ m}^3/\text{hr}$$

Table Result of Pumping Test(Constant head)

Time	Time Elapsed min	Discharge Rate m ³ /hr	Depth m	Fluctuation m
	0.5	1.5	6.50	0.00
	1	1.5	6.54	-0.04
	1.5	1.5	6.56	-0.06
	2	1.5	6.57	-0.07
	2.5	1.5	6.62	-0.12
	3	1.5	6.68	-0.18
	3.5	1.5	6.78	-0.28
	4	1.5	6.90	-0.40
	4.5	1.5	7.03	-0.53
	5	1.5	7.10	-0.60
	6	1.5	7.27	-0.77
	7	1.5	7.35	-0.85
	8	1.5	7.30	-0.80
	9	1.5	7.25	-0.75
	10	1.5	7.22	-0.72
	15	1.5	7.17	-0.67
	17	1.5	7.12	-0.62
	20	1.5	7.12	-0.62
	21	1.5	7.11	-0.61
	23	1.5	7.08	-0.58
	25	1.5	7.07	-0.57
	27	1.5	7.05	-0.55
	29	1.5	7.04	-0.54
	30	1.5	7.03	-0.53
	35	1.5	7.01	-0.51
	40	1.5	6.99	-0.49
	45	1.5	6.98	-0.48
	50	1.5	6.98	-0.48
	60	1.5	6.97	-0.47
	70	1.5	6.96	-0.46
	80	1.5	6.96	-0.46
	90	1.5	6.96	-0.46
	120	1.5	6.96	-0.46
	180	1.5	6.96	-0.46
	180.5	0	6.94	-0.44
	181	0	6.92	-0.42
	182	0	6.89	-0.39
	183	0	6.87	-0.37
	184	0	6.86	-0.36
	185	0	6.85	-0.35
	186	0	6.84	-0.34
	187	0	6.83	-0.33
	188	0	6.81	-0.31
	189	0	6.80	-0.30
	190	0	6.79	-0.29
	195	0	6.75	-0.25
	197	0	6.70	-0.20
	200	0	6.66	-0.16
	201	0	6.62	-0.12
	203	0	6.54	-0.04
	205	0	6.53	-0.03

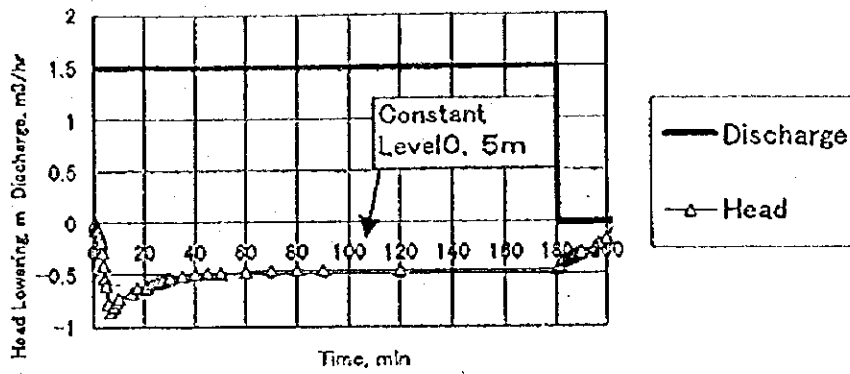


Figure Permeability Test, Constant Head

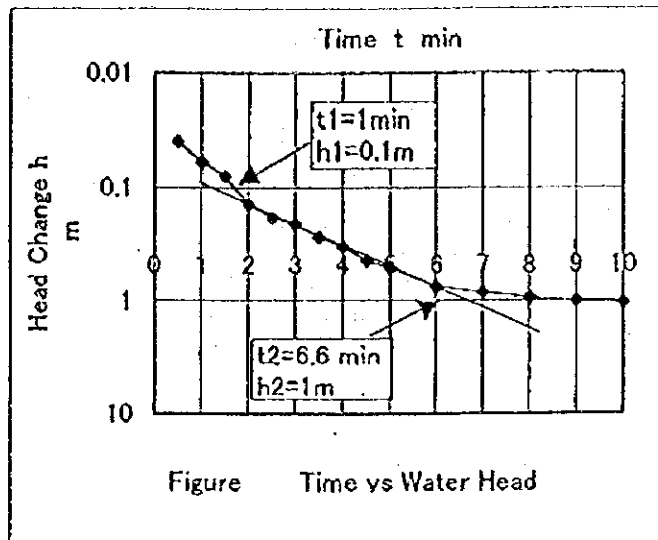
Comment 2

Groundwater table became stable 0.5m below natural level at pumping rate of 1.5 t/m^3 .

$$\begin{aligned} \text{Water depth} &= \text{well bottom} - \text{natural groundwater level} \\ &= 8.75 - 6.42 \\ &= 2.32\text{m} \end{aligned}$$

We conclude that pumping rate 1.5 t/m^3 is no problem since fluctuation of 0.5m is much less than water depth of 2.32m.

Time min	Fluctuation m
0	
0.5	0.04
1	0.06
1.5	0.08
2	0.14
2.5	0.18
3	0.21
3.5	0.27
4	0.33
4.5	0.44
5	0.51
6	0.74
7	0.84
8	0.92
9	1
10	1.04
15	1.39
20	1.84
25	2.15
30	2.15



Estimation of Peameability of Ground

$$k = \frac{2\pi R}{11(t_2 - t_1)} \ln\left(\frac{h_2}{h_1}\right) = \frac{2 \times 3.14 \times 100}{11 \times (6.6 - 1) \times 60} \ln\left(\frac{1}{0.1}\right) = 0.17 \text{ cm/sec}$$

Where:

- k: permeability of ground
- R: radius of well, 100cm
- t: time
- h: change of water head

5-3 Water Quality Results

WATER QUALITY RESULTS

RURAL WELL PROGRAM



Water Quality Laboratory
 Dept. of Water Resources
 Abuko, the Gambia
 Tel.: (220) 472162

Location details:

ID Code:	RW-412	District:	KOMBO SOUTH
Village:	TANJI	Division:	WED
Compound:	FISHERIES (WIN MILL)		
Well code:	RWS	Well type:	CWH
Chlorination data (M-Q-Y):	Not chlorinated		

Sampling date: 11/12/1998 Weather: CLOUDY

Test Results:

Guideline values:

pH	5.50	6.5-8.5	
Temperature (C):	25.7	Acceptable	
EC (uS/cm):	171.1	1300	
TDS (mg/l):	81.0	1000	
Odor:	NORMAL	Normal	
Turbidity (FTU):	< 5	≤ 5	
Salinity (promille):	0.1		
Alkalinity (mg CaCO ₃ /l):	8.2	> 20	
Free CO ₂ (mg/l):	52		
Total Hardness (mg CaCO ₃ /l):	24.7	200	
Calcium (mg Ca/l):	7.6	200	
Magnesium (mg Mg/l):	1.4	150	
Chloride (mg Cl/l):	41.7	250	
Total Iron (mg Fe/l):	0.0	0.3	
Ammonia (mg N-NH ₃ /l):	NT	0.5	
Nitrate (mg N-NO ₃ /l):	5.0	5	
Nitrite (mg N-NO ₂ /l):	0.015	0.03	
Phosphate (mg PO ₄ /l):	NT	0.3	
Silica (mg SiO ₂ /l):	NT		
Residual Chlorine:	NT	0.6	
Sulphate (mg SO ₄ /l):	NT	25	
Fluoride (mg F/l):	NT	1.5	
Manganese (mg Mn/l):	NT	0.05	
Potassium (mg/l):	NT		
Sodium (mg/l):	NT	150	
TC (/100 ml):	4520	nil	
FC (/100 ml):	1020	nil	

Sanitary survey: GRASSY

Remarks: NT= not tested

Wednesday, November 18, 1998

Officer in charge:

Table 2 Quality of Groundwater

	unit	WHO Standard	Tanji							Bafut	Batukunku	Sanyang	Cunjul	Banjul
			Wind-mill		Shallow well	Deep well	Ice-making plant	Wind-mill	Wind-mill					
			After pumping	Before pumping										
Total bacteria	group / 100mL	100<												
Coliform	group / 100mL	Nil	4,520	5,000	5,000	5,000	0	0	0	5,000	0	5,000	0	
Heavy metals etc.,	mg/L													
Nitrate	mg/L	50<	5.0											
Nitrite	mg/L	3<	0.015	<0.006										
Zinc	mg/L	1<												
Iron	mg/L	0.3<	0.0	<0.2										
Copper	mg/L	1<												
Sodium	mg/L	200<												
Manganese	mg/L	0.1<												
Chloride	mg/L	250<	41.7											
Hardness	mg/L	--	24.7	50										
Total Dissolved Solid	mg/L	1,000<	81											
COD	mg/L	--	5	0										
pH		should be acceptable	5.5	5.2	5.48	5.41	6.41	5.43	5.43	5.26	5.81	5.60	6.08	
Taste		should be acceptable	accepted	accepted	accepted	accepted	accepted	accepted	accepted	accepted	accepted	accepted	accepted	
Odour		should be acceptable	accepted	accepted	accepted	accepted	accepted	accepted	accepted	accepted	accepted	accepted	accepted	
Colour		should be acceptable	accepted	accepted	accepted	accepted	accepted	accepted	accepted	accepted	accepted	accepted	accepted	
Turbidity	°C	5<	<5	1	4	0	0	0	0	0	1	0	1	
Conductivity	S/m	--	0.017	0.02	0.019	0.004	0.070	0.007	0.007	0.006	0.02	0.09	0.007	
Temperature	°C	should be acceptable	25.7	30.0	29.3	30.3	29.3	30.8	30.8	30.5	30.2	28.8	29.5	
Depth	m		8.2		10	50	12	20	20	10	10	15	--	

6. List of Maintenance and Construction Tools

1. MAINTENANCE TOOLS FOR REFRIGERATION FACILITY

Vacuum pump	1set
Manifold gauge set	1set
Ratchet handle for valve operation(1/4)	2pcs
Fron detector	1set
Cartridge bomb for fron detector	12pcs
Overhaul tool with tool box for compressor	2sets
Flaring tool set	1set
Torque wrench for compressor(Preset type)	1set
Circuit tester	1set

2. CONSTRUCTION TOOLS FOR REFRIGERATION FACILITY

Operation tool set	1set
Pipe wrench 350 L	1set
Pipe wrench 900L	1set
Transformer 200V,100V,3KVA	1set
ARC welding machine	1set
Cable for above with reel set 20M	1set
Clamp for welding rod	1set
Welding mask and apare welding glass	1set
Oxy-acetylene welding and cutting apparatus	1set
Electric wiring tools	1set
Hammer I	1set
Soft hammer	1set
Vise(wide 150mm)	1set
Machinists files	1set
Caulking gun	1set
Air compressor	1set

3. MAINTENANCE TOOLS FOR DIESEL ENGINE GENERATOR

Nozzle tester	1set
Torque wrench	1set
Gear Puller for crankshaft	1set
Circuit tester	1set
Crankshaft gear tool	1set
Wrench for cylinder head	1set
Cam shaft puller	1set
Snap ring puller	1set
Liner puller	1set
Ring tool	1set
Thickness gauge	1set
Electric soldering iron with rod	1set

4. SPECIAL TOOLS FOR OUTBOARD MOTORS

Dial Gauge Set	1 no.
Teat Propeller (E15,25,40)	1 set.
Crankshaft Disassembly & Assembly Tool	1 no.
Crank Aligner	1 no.
Pocket Tester	1 no.
Timing Light	1 no.
Compression Gauge	1 no.
Peak Voltage Adaptor	1 no.
Stopper Guide Plate	1 no.
Claw-2. Bearing Housing Puller	1 no.
Center Bolt	1 no.
Pinion Nut Holder	1 no.
Drive Shaft Holder-3	1 no.
Flywheel Puller	1 no.
Flywheel Holder	1 no.
Bearing Outer Race Puller	1 no.
Small End Bearing Installer-3, 4	1 set.
Handle, Slide Hammer	1 no.

Claw-1. Outer Race Puller	1 no.
Bearing Separator	1 no.
Bearing Puller	1 no.
Claw-1. Bearing Puller	1 no.
Stopper Guide Stand	1 no.
Small End Bearing Installer-6	1 no.
Driver Rod-SL	1 no.
Bearing Depth Plate	1 no.
Driver Rod-SS, LL, LS	1 set.
Needle Bearing Attachment (a)(b)(c)(d)	1 set.
Bearing Outer Race Attachment	1 no.
Ball Bearing Attachment (a)(b)(c)(d)(e)	1 set.
Bearing Inner Race Attachment (a)(b)(c)(d)(e)	1 set.
Center Bolt. Bush Puller	1 no.
Spacer-1. Bush Puller	1 no.
Bush Attachment	1 no.
Driver Rod, Bush Remover/Installer	1 no.
Shimming Plate	1 no.
Pinion Height Gauge	1 no.
Pinion Height Plate	1 no.
Digital Caliper	1 no.
Magnet Base	1 no.
Backlash Indicator	1 no.
Digital Circuit Tester	1 no.
Digital Tachometer	1 no.
Leakage Tester	1 no.
4 Pins Test Harness (a), (b)	1 set.
Magnet Base Plate	1 no.
15-ton Press	1 no.

7. References

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