

(1) By eliminating the present bottleneck to research activities at AFRC that has developed from rapid expansion of the work load and a serious shortage of space, there will be a great improvement in the pace of overall research activity, particularly in the fruits of this research effort.

(2) Through improvements in the center's aquaculture facilities, it will be possible to

- improve water quality,
- restore the original functions of the adult shrimp tank, and
- secure an adequate supply of filtered water, leading to an expansion of post-larval shrimp production.

(3) With a fully developed Marine Conservation Division, It will be possible to

- monitor pollution and contamination both on the shoreline and inside the lagoons, the very areas that attract tourists,
- shed light on the coastal marine structure through research on riverline, estuary and coastal currents, and
- monitor the quality of coastal waters,

thereby helping to formulate policies for preserving the marine environment.

(4) A stepped-up growth in information and educational activities will foster a broader public understanding and appreciation of environmental and marine preservation and conservation of fishery resources.

Based on the above evaluation, implementation of this Plan can be expected to stimulate further progress in the activities of the Albion Fisheries Research Center, lead to an expansion of aquaculture production, and help to solve the problems being addressed in the Mauritius National Development Plan.

5.2 Conclusions and Suggestions:

The twin objectives of fishery development in Mauritius are to

(1) maintain a safe and stable supply of fish products as a prime source of animal proteins, and
(2) contribute to foreign exchange earnings through exports. The Fisheries Development Plan for Mauritius lays primary emphasis on maximum utilization of fishery resources within sustainable limits, while conserving marine resources and the environment, and basic research on the ecosystem is seen as a sinequanon for attaining these goals.

The AFRC conducts research in such areas as fishery resources, aquaculture development, and marine conservation. However, research volume at the Center was grown more than five-fold since its establishment, while the organization has expanded accordingly to 4 research divisions and 1 administrative division, with a parallel increase in the size of both the research and administrative staff. This sudden growth has now outstripped the Center's intake capacity and has even created obstacles to the performance of its routine research programs.

In addition, in the current National Development Plan, it is suggested that many new projects be undertaken by the AFRC, such as the establishment of Marine Parks for ecosystem protection in the lagoons and the formulation of environmental protection plans, which underscore the nation's high hopes for major progress in research on the marine environment, as well as studies oriented to resource management, such as the introduction of a permit system for the Banks fishery. It is, therefore, strongly desired that the research facilities at the Center be expanded and that new research equipment be provided.

The project to expand the AFRC is intended to enlarge the Center's research facilities and furnish a variety of new research equipment to enable it to respond more effectively to these growing and diversified research demands.

AFRC, as already noted, is the only national institute undertaking basic research in the fisheries and marine sector, including interdisciplinary programs in marine conservation, and so its role is indeed critical. The Plan facilities are to be located in the area containing the existing AFRC complex, and the Plan site has been firmly secured therein. The site is flat, and foundation conditions pose no special problems.

The current research projects being planned at AFRC include studies on coral ecology, coastal currents and the coastal marine environment, quality of coastal waters, coliform bacilli at seawater beaches, and aquaculture seed production. It is appropriate that these projects continue.

The AFRC falls under the jurisdiction of the Ministry of Fisheries and Marine Resources and is under the direction of a Principal Fisheries Officer who supervises the Research Division. Annual operating costs for the Center's facilities and equipment are estimated at about Rs 900,000.

The research equipment provided in the subject Plan will contain no sophisticated instruments requiring special technical guidance or operational training and so can be amply handled and supervised by existing research personnel at AFRC. The Center has had no special problems in operating the facilities and equipment provided under previous grand-aids or independent equipment grants from Japan, and the administrative structure is firmly established, while budgets have been secured.

Based on this history, it has been determined that there will be no problems with operating controls after the grant is completed.

The subject plan is being positioned as a priority project in the 6th National Developmental Plan. When implemented, it will clearly play a key role in fishery development and marine conservation in Mauritius. The Plan can be expected to improve the quality and results of AFRC research programs. And, with the improvements in aquaculture facilities, an increase is anticipated in the production of post-larval shrimp. In addition, with full development of the Marine Conservation Division, data on the marine environment will accumulate, contributing to the creation of new policies for protecting this environment. Finally, the further development of dissemination and educational activity can be expected to spread a proper understanding of environmental protection, fishery research conservation, and marine conservation.

From the above assessment, implementation of this Plan should lead to major progress in AFRC activities, increases in aquaculture production, invigoration of programs for fishery resource conservation and environmental protection, and dissemination of information on resource conservation among fishermen and the general public. Through these diverse activities, the Plan can be expected to contribute in a major way to solving the problems raised in the National Development Plan. Accordingly, we have concluded that there is considerable significance in implementing this Plan under a grant-aid from Japan.

Looking ahead to Plan realization, the basic design study team is privileged to make the following suggestions to the Ministry of Fisheries and Marine Resources and the Albion Fisheries Research Center:

1) It is admittedly most difficult to advance the cause of ecological conservation while also striving for the development of aquaculture and fisheries. This is particularly true in the case of coral reefs and mangrove areas, which stand in so precarious a balance in the ecosystem.

The problem of developing aquaculture and fisheries while maintaining a sound environment and avoiding adverse impact on the ecosystem is one that is indeed consuming the energies of the developed nations as well. In this connection, it is desirable that, when coming to grips with these complex problems, Mauritius research many precedents, including those of Japan, and make full use of technical cooperation programs from these countries.

2) It is estimated that the future operating costs connected with this Plan will be in the order of Rs 900,000 per annum. It will be necessary, we believe, to take steps to secure these operating funds when formulating the next budget.

ANNEX

- 1. Team Members**
- 2. Survey Itinerary**
- 3. Discussants**
- 4. Minutes of Discussion**
- 5. Site Survey**
 - 5-1 Site level Measurement Survey**
 - 5-2 Boring Log**
- 6. Equipment List**

Appendix 1

TEAM MEMBERS

FIELD SURVEY

Toru KUMATANI	Team leader	Assistant Director, Office for Overseas Fishery Cooperation, Fisheries Agency
Hidenao WATANABE	Grant Aid Cooperation	Grant Aid Division, Economic Cooperation Bureau Ministry of Foreign Affairs
Toshiya OGASAWARA	Facilities Construction Planner	Fisheries Engineering Co.,Ltd.
Kenichi KIKUTANI	Laboratory Equipment Planner	Fisheries Engineering Co.,Ltd.
Kuniaki TAKAHASI	Station Facilities Planner	Fisheries Engineering Co.,Ltd.

DRAFT REPORT EXPLANATION

Noboru TAZOE	Team leader	Chief, Office for Overseas Fishery Cooperation, Fisheries Agency
Sinji SENO	Grant Aid Cooperation	Grant Aid Division, Economic Cooperation Bureau Ministry of Foreign Affairs
Toshiya OGASAWARA	Facilities Construction Planner	Fisheries Engineering Co.,Ltd.
Kenichi KIKUTANI	Laboratory Equipment Planner	Fisheries Engineering Co.,Ltd.

Appendix 2 Survey Itinerary

Field Survey

Date	Movement	Activities
Jan. 16 Sun.	Ar. Mauritius	Discussion with JICA & OFCF Experts
Jan. 17 Mon.		Courtesy call on the Ministry of Economic Planning & Development, Ministry of Fisheries and Marine Resources, Albion Fisheries Research Center(AFRC)
Jan. 18 Tue.		Discussion with AFRC
Jan. 19 Wed.		Discussion with AFRC, Site survey
Jan. 20 Thu.		Discussion with AFRC, Visit to Port Louis Fish Market, Fish Port, Survey on Fisheries in Mauritius
Jan. 21 Fri.		Courtesy call on Honorary Consul General for Japan in Mauritius. Discussion with AFRC
Jan. 22 Sat.		Discussion within team members
Jan. 23 Sun.		Visit to projected site for Marine Park, Barachois
Jan. 24 Mon.		Discussion with AFRC, Survey of Equipment & Facilities of AFRC, Site survey
Jan. 25 Tue.		Discussion with AFRC, Site survey
Jan. 26 Wed.		Signed Minutes of Discussions, Visit to Barachois in Eastcoast
Jan. 27 Thu.	Leave Mauritius	Discussion within team members
Jan. 28 Fri.	(Mr. kumatani & Mr. Watanabe)	Discussion with AFRC
Jan. 29 Sat.		Market Survey
Jan. 30 Sun.		Discussion within team members
Jan. 31 Mon.		Site Survey, Market Survey
Feb. 1 Tue.		Construction Survey
Feb. 2 Wed.		Market Survey
Feb. 3 Thu.		Discussion with AFRC, Construction and Transports Survey
Feb. 4 Fri.		Discussion with AFRC
Feb. 5 Sat.		Market Survey
Feb. 6 Sun.	Leave Mauritius	

Draftreport Explanation

Date	Movement	Activities
Apr.10 Sun.	Ar.Mauritius	Discussion with JICA Experts
Apr.11 Mon.		Discussion with Team Members
Apr.12 Tue.		Courtesy call on Honorary Consul General for Japan in Mauritius, Ministry of Economic Planning Development, Ministry of Fisheries and Marine Resources and AFRC .
Apr.13 Wed.		Discussion with AFRC
Apr.14 Thu.		Site Survey, Discussion with AFRC
Apr.15 Fri.		Signing of the Minutes
Apr.16 Sat.	Leave Mauritius	(Mr. Tazoe, Mr.Ogasawara, Mr, Kikutani)
Apr.17 Sun.	Leave Mauritius	(Mr. Seno)

Appendix -3 Discussants

Field Survey

Mr. Mathieu Lacle	Minister of Fisheries and Marine Resources
Mr. Bonomally	Principal Assistant Secretary, MFMR
Mr. B. Boyramboli	Administration Officer, MFMR
Mr. M. Munbodh	Principal Fisheries Officer, Albion Fisheries Research Centre, MFMR
Mr. T.F. Chan Fong	Permanent Secretary, Ministry of Environment and Quality of Life
Mr. B.A. Budor	Deputy Director, Department of Environment, MEQL
Mr. P. Ramgolam	Environment Officer, DOE, MEQL
Dr. V. Farced	Scientific Officer, National Environment Laboratory, DOE, MEQL
Mr. G. Wong So	Deputy Director, Ministry of Economic Planning & Development
Mr. P.A.Mohamudally	Economist, MEPD
Mr. R.S.Veeramundur	Economist, MEPD
Mr. V. Chineah	Divisional Scientific Officer, AFRC
Mr. Ismet Jehangeer	Divisional Scientific Officer, AFRC
Mr. D. Georah	Divisional Scientific Officer, AFRC
Mr. K. Hawabhay	Scientific Officer, AFRC
Mr. D. Mauree	Scientific Officer, AFRC
Mrs. Y.Basant Rai	Scientific Officer, AFRC
Mrs. O. Vankatasami	Scientific Officer, AFRC
Mr. Diwakar Gangapersad	Scientific Officer, AFRC
Mr. V. Chosranaun	Scientific Officer, AFRC
Mr. M. Nallee	Scientific Officer, AFRC
Mr. R.A. Bheeroo	Scientific Officer, AFRC
Mr. N.Wan Sei Cheong	Senior Technical Officer, AFRC
Mr. C. Paupiah	Technical Officer, AFRC
Mrs. R. Moethien Pillay	Technical Officer, AFRC
Mr. P. Neermul	Technical Officer, AFRC
Mr. P. Amoordon	Store Officer, AFRC, Ministry of Finance
Mr. Shanon B. Lalsing	Traffic Manager, Mauritius Maritime Authority
Mr. Prem Mohit	Chairman, Agricultural Marketing Board
Mr. K. Balmik Daby	Assistant General Manager, AMB
Mr. G. Puiriw	Deputy Controller, Government Fire Services
Mr. G. Paul	SMO, Government Fire Services
Mr. N. Treabhohum	Commercial Superintendent, Central Electricity Board
Mr. P. Vythelingum	Senior Inspector, CEB
Mr. Garbeth Hurree	Principal Engineer, Ministry of Works
Mr. Colin A. Hare	Honorary Consul General for Japan in Mauritius
Mr. Ryutaro Fujii	Councillor, Embassy of Japan
Mr. Tomomi Hirano	Second Secretary, Embassy of Japan
Mr. Kazuhito Hiramatsu	Expert, JICA
Mr. Masaru Yamauti	Fisheries Expert, Overseas Fishery Cooperation Foundation(OFCF)
Mr. Masaki Oikawa	Fisheries Expert, Overseas Fishery Cooperation Foundation(OFCF)
Mr. Masato Sata	Fisheries Expert, Overseas Fishery Cooperation Foundation(OFCF)
Mr. Giiti Onda	General Manager, Kaigai Gyogyo k.k
Mr. Yoshihiro Konno	Assistant to the General Manager, Kaigai Gyogyo k.k

Draft Report Explanation

Mr. Mathieu Lacle	Minister of Fisheries and Marine Resources
Mr. Harry Ganoo	Permanent Secretary, MFMR
Mr. B. Mootoo	Adviser
Mr. Bonomally	Principal Assistant Secretary, MFMR
Mr. B. Boyramboli	Administration Officer, MFMR
Mr. M. Munbodh	Principal Fisheries Officer, Albion Fisheries Research Centre, MFMR
Mr. G. Wong So	Deputy Director, Ministry of Economic Planning & Development
Mr. D. Bundhoo	Senior Economist, MFMR
Mr. P.A.Mohamudally	Economist, MEPD
Mr. R.S.Veeramundur	Economist, MEPD
Mr. V. Chineah	Divisional Scientific Officer, AFRC
Mr. Ismet Jehangeer	Divisional Scientific Officer, AFRC
Mr. Diwakar Gangapersad	Scientific Officer, AFRC
Mr. V. M. Chooramun	Scientific Officer, AFRC
Mr. M. Nallee	Scientific Officer, AFRC
Mr. R.A. Bheeroo	Scientific Officer, AFRC
Mr. Colin A. Hare	Honorary Consul General for Japan in Mauritius
Mr. Ryutaro Fujii	Councillor, Embassy of Japan
Mr. Kazuhito Hiramatsu	Expert, JICA

MINUTES OF DISCUSSIONS
BASIC DESIGN STUDY ON THE PROJECT FOR
EXTENSION OF THE ALBION FISHERIES RESEARCH CENTER
IN
THE REPUBLIC OF MAURITIUS

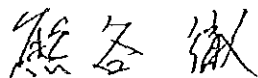
In response to a request from the Government of the Republic of Mauritius, the Government of Japan decided to conduct a Basic Design Study on the Project for Extension of the Albion Fisheries Research Center (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Mauritius a study team, which is headed by Mr. Toru KUMATANI, Assistant Director, Office of Overseas Fisheries Cooperation, Fishery Agency, and is scheduled to stay in the country from January 16 to February 6, 1994.

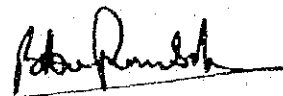
The team held discussions with the officials concerned of the Government of Mauritius and conducted a field survey at the study area.

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

Port Louis, January 26, 1994



Mr. Toru Kumatani
Leader
Basic Design Study Team
JICA



Mr. Bojrazsingh BOYRAMBOLI
Ag. Principal Assistant
Secretary
Ministry of Fisheries &
Marine Resources

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ATTACHMENT

1. Objective

The objective of the Project is to improve facilities and equipment of the Albion Fisheries Research Center for development of fisheries and conservation of the marine environment in Mauritius.

2. Project site

The site of the Project is located in the existing site of the Albion Fisheries Research Center. (Project area and site map is attached as ANNEX-II.)

3. Executing Organization

Ministry of Fisheries and Marine Resources is responsible for the administration and execution of the Project.

4. Items requested by the Government of Mauritius

After discussions with the Basic Design Study Team, the following items were finally requested by the Mauritius side.

- 1) Facilities
 - a) Laboratories
 - b) Study Rooms
 - c) Offices
 - d) Conference Hall
 - e) Modification of the existing facilities, including seawater system, necessary for the Project
 - f) Other incidental facilities in the site
- 2) Equipment
 - a) Research Equipment for Marine Conservation
 - b) Equipment and materials for Aquaculture and Propagation
 - c) Research boats and transportation vehicles

However, the final components of the Project will be decided after further studies.

5. Japan's Grant Aid system

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

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6. Schedule of the Study

- (1) The consultants will proceed to further studies in Mauritius until February 6.
- (2) JICA will prepare the draft final report of the Project in English, and dispatch a mission in order to explain its contents to the Government of Mauritius around April 1994.
- (3) In case that the contents of the draft final report is accepted in principle by the Government of Mauritius, JICA will complete the final report and send it to the Government of Mauritius around June 1994.

BA

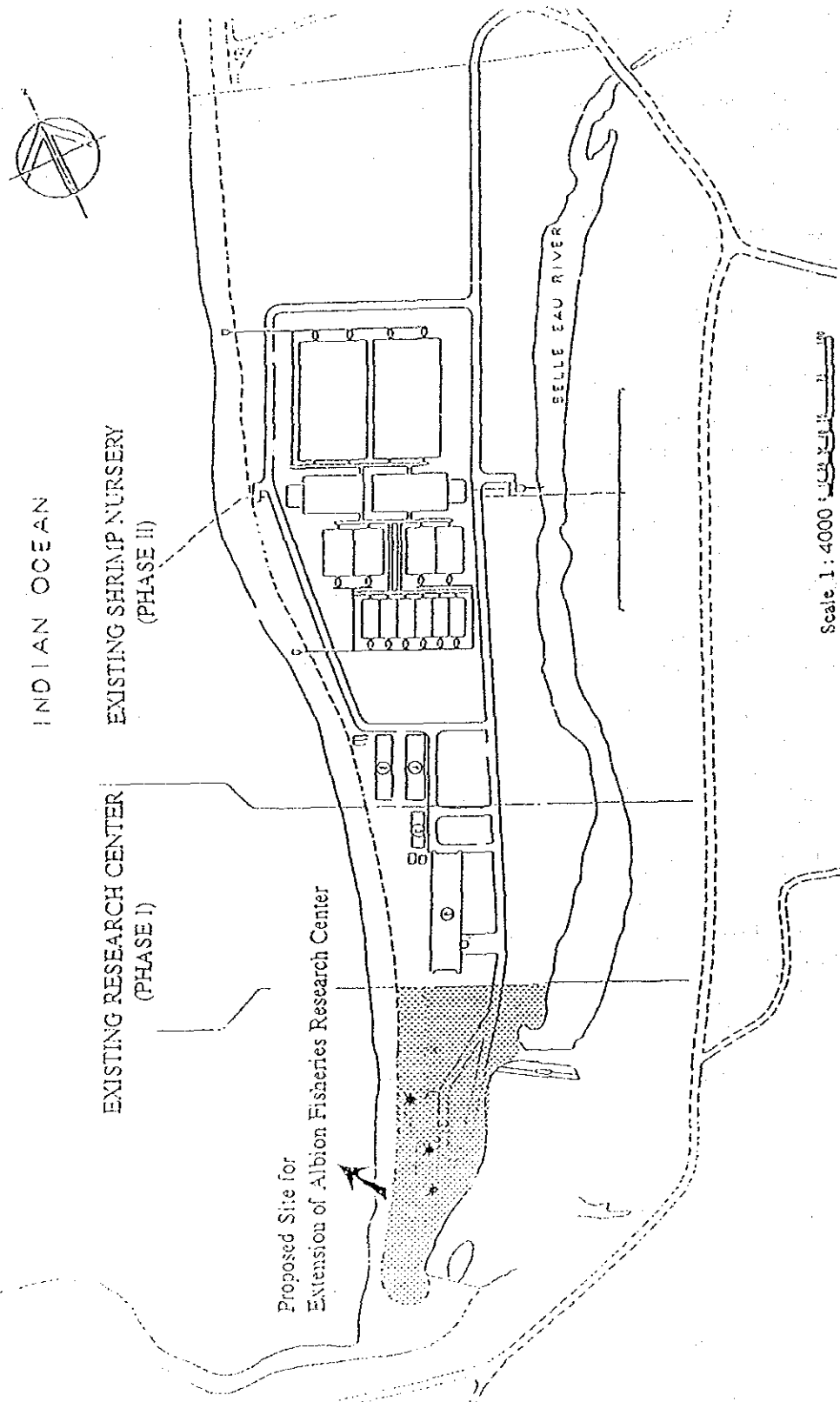
ANNEX 1

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

1. To secure the site for the Project.
2. To clear, level and reclaim the site prior to commencement of the construction.
3. To undertake incidental outdoor works such as gardening, fencing, gates and exterior lightning in and around the site.
4. To construct the access road to the site prior to commencement of the construction.
5. To provide facilities for distribution of electricity, water supply, telephone, drainage, sewage and other incidental facilities to the Project site.
 - 1) Electricity distributing line to the site.
 - 2) City water distribution main to the site.
 - 3) Drainage city main to the site.
 - 4) Telephone trunk line and the main distribution panel of building.
 - 5) General furniture such as carpets, curtains, tables, chairs, and others.
6. To bear commissions to the Japanese foreign exchange bank for the banking services based upon the Banking Arrangement.
7. To exempt taxes and to take necessary measures for customs clearance of the materials and equipment brought for the Project at the port of disembarkation.
8. To accord Japanese Nationals whose services may be required in connection with the supply of products and the services under the verified contract such facilities as may be necessary for their entry into Mauritius and stay therein for the performance of their work.
9. To maintain and use properly and effectively that the facilities constructed and equipment purchased under the Grant.
10. To bear all the expenses other than those to be borne by the Grant, necessary for construction of the facilities as well as for the transportation and the installation of the equipment.

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LEGEND

Topographic Survey Area (1.4 ha)



* Boreholes (3 Nos.)



ALBION FISHERIES RESEARCH CENTER
PROJECT SITE LOCATION PLAN

Scale 1 : 4000

151

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Draftreport Explanation

MINUTES OF DISCUSSIONS
BASIC DESIGN STUDY ON THE PROJECT FOR
EXTENSION OF THE ALBION FISHERIES RESEARCH CENTRE
IN
THE REPUBLIC OF MAURITIUS
(CONSULTATION ON DRAFT REPORT)

In January 1994, the Japan International Cooperation Agency (JICA) dispatched a Basic Design Study Team on the project for Extension of the Albion Fisheries Research Centre (hereinafter referred to as "the Project") to the Republic of Mauritius, and through discussion, field study, and technical examination of the results in Japan, has prepared the draft report of the study.

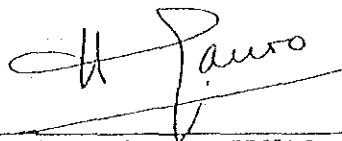
In order to explain and to consult the Mauritius side on the component of the draft report, JICA sent to Mauritius a study team, which is headed by Mr. Noboru TAZOE, Chief, Office of Overseas Fisheries Cooperation, Fishery Agency, and is scheduled to stay in the country from April 10 to 16, 1994.

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

Port Louis April 15, 1994

田 泰 伸

Mr. Noboru TAZOE
Leader
Draft Report Explanation
Team
JICA



Mr. Harry GANOO
Permanent Secretary
Ministry of Fisheries and
Marine Resources

ATTACHMENT

1. Component of the Draft report

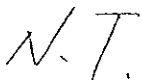
The Government of Mauritius has agreed and accepted in principle the components of the Draft Report proposed by the team.

2. Japan's Grant Aid System

- (1) The Government of Mauritius has understood the system of Japanese Grant Aid explained by the team.
- (2) The Government of Mauritius will take necessary measures described in Annex I of the Minutes of Discussions signed and exchanged on January 26, 1994, for smooth implementation of the project on condition that the Grant Aid Assistance by the Government of Japan is extended to the project.

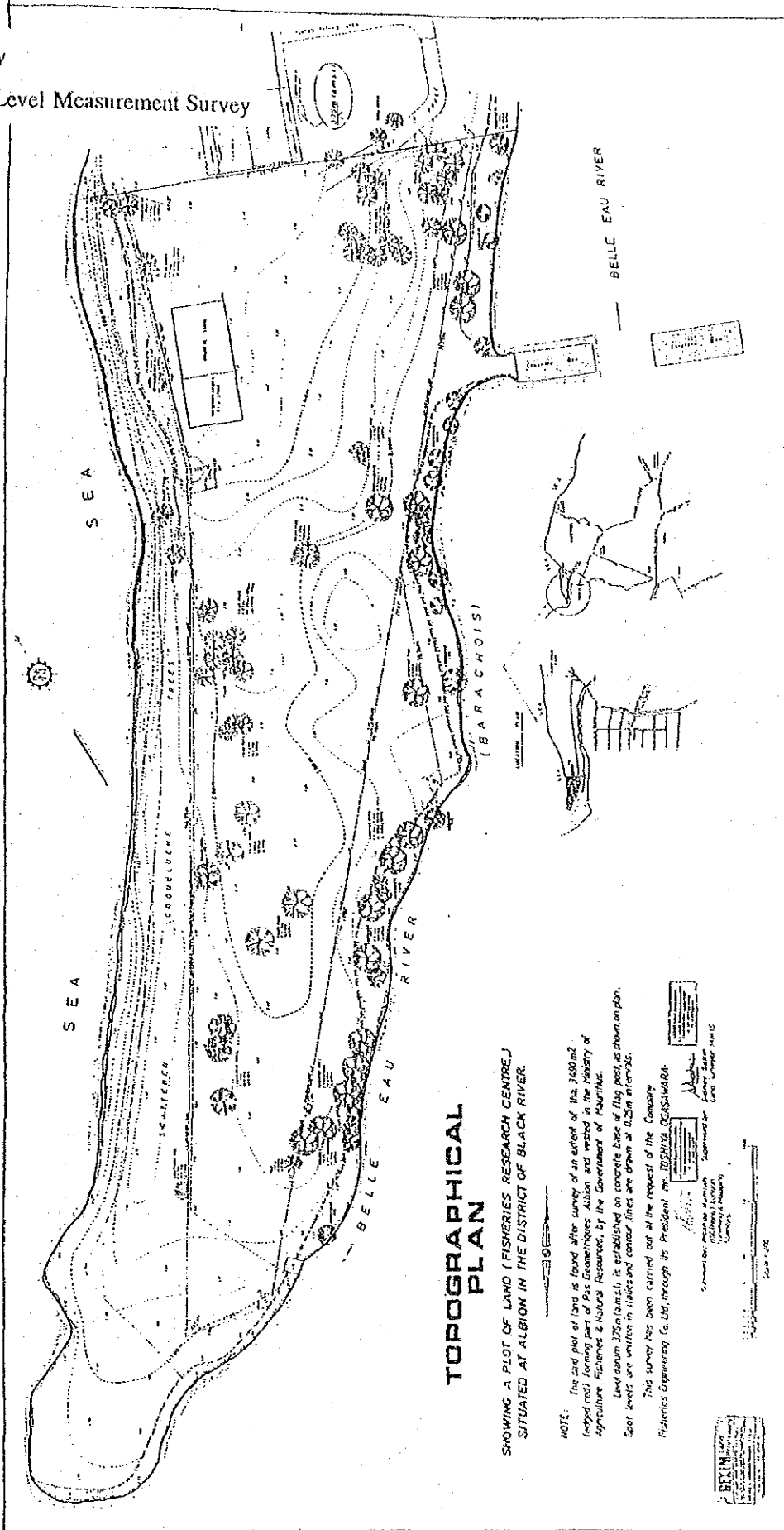
3. Further Schedule

The team will make the final report in accordance with the confirmed items, and send it to the Government of Mauritius by the end of July, 1994.

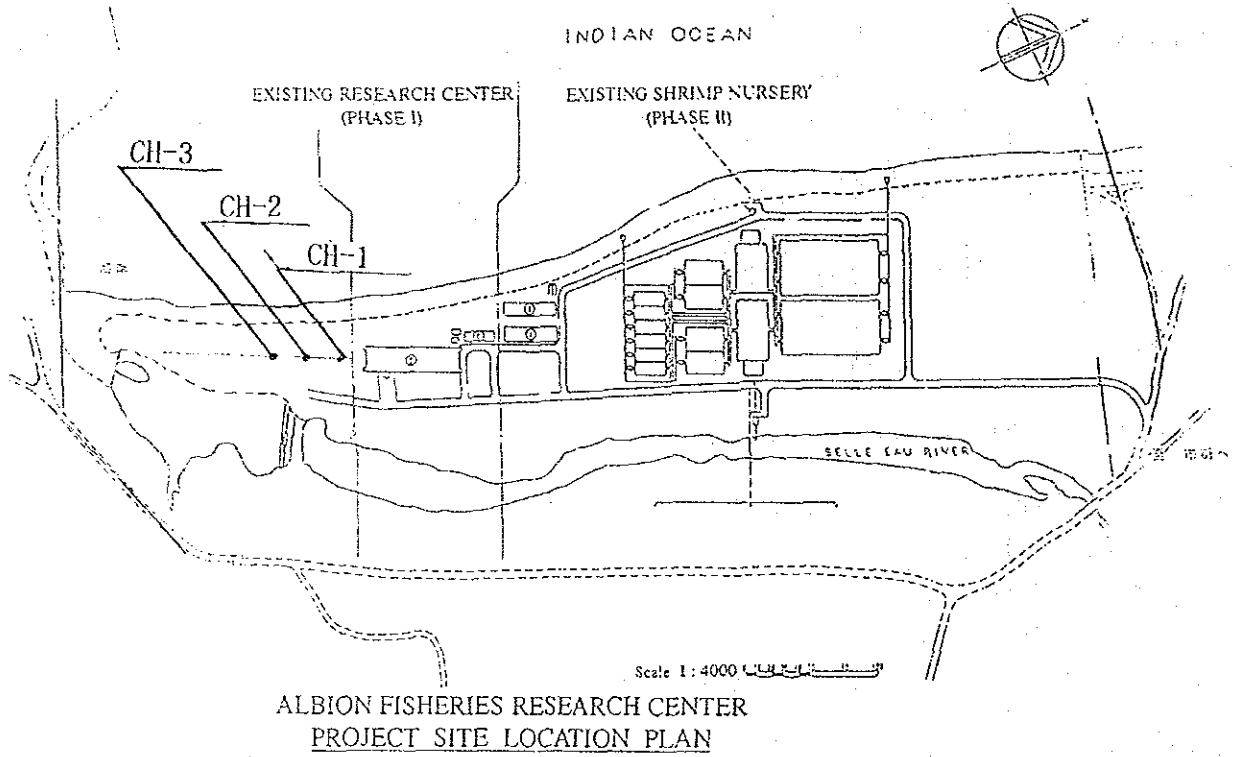


5. Site Survey

5-1 Site Level Measurement Survey

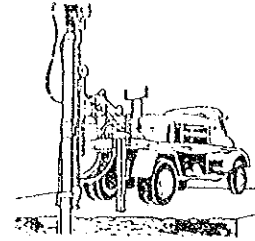


5-2 Boring Log



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-- GROUND WATER RESEARCH.
-- CIVIL ENGINEERING CONTRACTORS.

Rue Des Tamariniers,
Roche-Bois,
Mauritius.
Tel.: 242-5305
242-0459

PROJECT: ALBION FISHERIES RESEARCH CENTRE

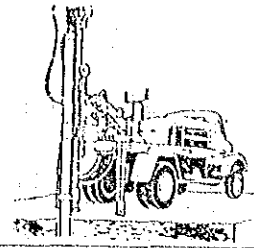
LOCATION: Albion
DATE STARTED: 19.01.94 20.01.94
DATE COMPLETED:

BORE HOLE No.1
DIAMETER OF B.H: 76 mm
RIG: GEMCO

DEPTH	LEGEND	DESCRIPTION OF STRATA	PRESSURE		% OF CORE REC:	SITE PLAN	REMARKS
			WATER	HYD			
0.3		top dirty brown coarse grain sand					
		Med-grain					
		lt. dirty brown sand					SPT1 1.0-1.5 N/V 3
2.0		coral frag. + yellowish brown sand					
2.5		med. fine grained brown sand					SPT2 2.0-2.5 N/V 26
4.0		lt. brown coarse grain sand					
4.5		lt. brown med fine grained sand					SPT3 4.0-4.5 N/V 13
5.1		lt. grey fine grain sand					
5.5		coarse grain sand					
6.0		med fine to fine grain sand					sand unit
6.8		lt. grey coral + shells					
7.1		med. grain fractured basalt		H/I	basalt		
7.9		lt. brownish grey mod. strong basalt fractured					
8.0		fine grained compact basalt broken					
9.5		yellow brown highly weathered basalt					
10.7		fine grained compact bluish grey basalt, broken					
11.0		weathered vesicular basalt with sec. clay deposits					
12.7		medium gr. fresh basalt					
14.4		w/ves. basalt					
14.6		desintegrated basalt					END OF COREHOLE
14.9							

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--- GROUND WATER RESEARCH.
 --- CIVIL ENGINEERING CONTRACTORS.

Rue Des Tamariniers,
 Roche-Bois,
 Mauritius.
 Tel.: 242-5305
 242-0459

PROJECT: ALBION FISHERIES RESEARCH CENTRE

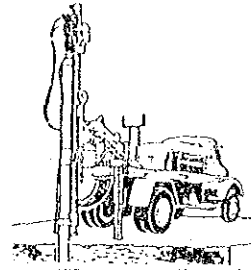
LOCATION: Albion
 DATE STARTED: 21.01.94
 DATE COMPLETED:

BORE HOLE No: CH2
 DIAMETER OF B.H: 76 mm
 RIG: Lemco

DEPTH	LEGEND	DESCRIPTION OF STRATA	PRESSURE		% OF CORE REC.	SITE PLAN	REMARKS
			WATER	HYD			
0.8		drity brown-medium grain sand					
1.0		medium grain sand					
1.5		lt. brown sand med. gr.					SPT 1: 1.0-1.5 N/V 16
2.0	U2 - 1						
2.5	SPT 2						SPT 2: 2.0-2.5 N/V 23
3.0	U2 - 2						
4.0		coarse grain brown sand					
		med. grain lt. greyish sand					SPT 3: 4.0-4.5 N/V 14
5.5		coarse grain sand					
6.0		coral fragments with shells					SPT 4: 5.5-6.0 N/V 13
6.6		coarse-grain compact basalt with localized vesicles with sec. zeolites, broken					
8.0		med. grain fresh compact localised vesicles					
9.0		fine grain fresh compact basalt with few vesicles					
9.8		fractured basalt fragments					
10.5		lt. greyish med. grain basalt, broken					
13.7		reddish tuff OLS					old land surface
			END OF COREHOLE				

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A DIVISION OF ASSOCIATED ENGINEERS LTD



- GROUND WATER RESEARCH
- CIVIL ENGINEERING CONTRACTORS.

Rue Des Tamariniers,
Roche-Bois,
Mauritius.
Tel.: 242-5305
242-0459

PROJECT: ALBION FISHERIES RESEARCH CENTRE

LOCATION: Albion
DATE STARTED: 21.01.94 25.01.94
DATE COMPLETED:

BORE HOLE No: CH3
DIAMETER OF B.H: 76 mm
RIG: Koken

DEPTH	LEGEND	DESCRIPTION OF STRATA	PRESSURE		% OF CORE REC.	SITE PLAN	REMARKS
			WATER	HYD			
		lt. brownish medium grain sand					SPT1 1.0-1.5 N/V 16 SPT2 2.0-2.5 N/V 14
4.0		lt. greyish coarse-grain sand					SPT3 4.0-4.5 N/V 27
5.5		lt. yellowish brown sand					
6.0		coarse grain sand					SPT4 6.0-6.5 N/V 14
6.5		simple coral frag					
6.8		med-gr. lt. greyish					
7.2		compact basalt broken					
7.6		H/W basalt					
8.0		H/F w. basalt					
8.3		lt. greyish med. grained compact basalt, broken					
8.9							
13.0		vesicular basalt					
13.2		lt. grey compact basalt			Basalt layer		
13.5	??	CORELOSS					old land
14.7	??	weathered vesicular basalt			END OF COREHOLE		

6. Equipment List

1. Equipment for Ecological Lab.		
Portable VHF radio	1W, 150MHz (marine)	6 numbers
Diving suits	Dry suits	5 sets
Underwater camera	35mm, 28mm, 20mm, 15mm lenses	1 set
Marine video accessories	Video light, battery, spare bulbs, etc.	1 set
Desicator	500x525x1, 000Haa	1 number
Underwater writing paper	A4 size	1,000 sheets
Dissection microscope	20x~300x, with camera	1 set
Diamond saw	0~300rpm	1 number
Lab. table	3,600x1,500mm	1 number
Lab. wagon	SUS304, 460x760x960mm	2 numbers
2. Equipment for chemical Lab.		
DO meter	Portable type, cable 7.5m, w/spare bulbs	2 numbers
pH meter	Resolution: 0.01	1 number
BOD apparatus	Accuracy: 0.01, w/spare bulbs	1 number
Draft chamber	L: 750×W: 1,500×H: 2,100mm	1 number
Magnetic stirrer	100ml~7 liters	1 number
Niskin water sampler	5 liters	2 numbers
Van-Dorn water sampler	20 liters (10 liters×2)	1 number
Refrigerator	350 liters	1 number
Salinity Refractometer	Salinity: 0~100‰	2 numbers
Electric analytical balance	weighing : 0~200 g. precision: 0.001g	2 numbers
Freezer	540 liters, -20°C	1 number
Deionized distillery still	1.8 liters/hour	1 set
Seawater analyses kit	Cr(VI), NO ₂ -N, NO ₃ -N, NH ₄ -N, PO ₄ -P	1 set
Auto analyzer	Sulfate, silicate, nitrate, phosphate	1 set
Muffle furnace	11 liters, 1150°C	1 number
Drying oven	90 liters, 40°C~250°C	1 number
Auto cleave	80 liters, 1.6kg/cm ²	1 number
Supersonic pipet washer	50W, 28kHz	1 number
Turbidity meter	0~1,000NTU, accuracy: ±2%	1 number
Conductivity meter	0~20ms/cm	1 number
Lab. table	3,600X1,500mm	1 number
Storage cabinets	1800X750mm, 1800X560mm	2 numbers
Safety goods	Masks, gloves, goggles	1 Lot
Glass ware	Beakers, flasks, graduated cylinders, measuring pipets	1 Lot
Lab. table	sus 304, 460x760x960mm	2 numbers
3. Equipment for Bacteriological Lab.		
Vacuum pump	0.6litters/min at 635mmHg	1 number
Membrane filtration set	φ47mm	10 sets
Incubator	35°C±0.5°C, 45°C±0.2°C	1 number
Incubator(water bath)	27°C~60°C	1 number
Incubation box	290 litter, 3°C~45°C	1 number
Electric analytical balance	0~200g, Precision: 0.1mg	1 number
Incinerator	100 liters	1 number
Biological microscope	1,000×, with teaching head set, camera	1 number
Inverted microscope	40×~400×, w/camera	1 number
Stereo microscope	20×~300×	1 number

Water bath incubator	20 liters	1 number
Fecal coliform field kit	Filter holder assembly, funnel	1 set
Coliform kit	Plastic pipets, vial bottles	10 sets
Plastic petridishes	φ47mm, 200sets/pac	30 pacs
Media for filter holders	MF-Endo, M-FC, KF-ACAR (powder, 110g/pack)	20 sets
UV sterilizer	φ47mm filter holder x 3	1 number
Magnetic stirrer	30~1,500rpm	1 number
Clean bench	1,600x800mm	1 number
pH meter	Resolution: 0.01	1 number
Autoclave	47 liters, 2.5 kg/cm ²	1 number
Lab. table	1,500x3,600mm	1 number
Centrifuge	6,000rpm, 500 ml	1 number
Safety goods	Gloves, caps, boots, sterilizing mat	1 set
Refrigerator	350 liter	1 number
Freezer	540 liters, -20°C	1 number
Deionized distillery still	1.8liters/hour	1 number
Cabinet for sterilized apparatus	1,200x360x1,700mm, w/UV lamp	1 number
Storage cabinets	1,800x750mm, 1,800x500mm	2 numbers
Wash basin	φ340mm, double basins, w/stand	1 number
Anti-vibration stand for analytical balance	500x500x54mm	1 number
Lab. wagon	SUS304, 460x760x960mm	2 numbers
4. Equipment for Physical Lab.		
Buoy	φ300mm, buoyancy:12,000g	20 numbers
	φ240mm, buoyancy:6,000g	20 numbers
Current meter	Range:0.03~3m/sec	2 numbers
Portable wind velocity/direction meter	Range:3~30m/sec, 16 directions	1 number
Fluorescence analyser	5~200nm	1 number
Sediment grab (Ekman-berge type)	15x15x15cm	1 number
Bottom corer (Nauman type)	φ2.2cmx50cm	1 number
Sediment grain-size analysis equipment	φ150mm, w/shaker, 0.05, 0.2, 0.5, 1.0, 3.0mm	1 number
Drying oven	90liters, 40°C~250°C	1 number
Sextant	Telescope: 4x40mm	4 numbers
Echo sounder	Measurable depth:0.3~120m, min. reading 0.1m	1 number
Turbidity meter	Range:0~100, w/cable 50m	1 number
Salinometer	0~32‰(±0.1‰), 32~42‰(±0.03‰), w/cable 50m	1 number
Reversing thermometer	-5~+35°C, scale:1/5	4 numbers
C STD	salinity/conductivity:0~100ppt/μs, temp. -5~+45°C, depth: 50m	1 number
Rope	Nylon, φ10mm x 200m	5 rolls
Snap-hook	φ20mm, w/swivel	50 numbers
Silicon grease	100g	20 numbers
Manual winch	Winding capacity: 20 kg, wire 200m	1 number
Lab. table	1,500x3,600mm	1 number
Tracing table	1,300x950x790~1,000mm	1 number
Map holder	660x450x1,170mm	2 numbers
Lab. wagon	SUS304, 460x760x960mm	2 numbers
5. Data Processing Equipment		
Desktop computer	32bit, 25MHz, HD:120MB, RAM:4MB	2 numbers
Lap-top computer	32bit, 25MHz, HD:200MB, RAM:4MB	3 numbers
UPS	1,500VA	5 numbers
Desitiser	Reading range:380 x 260mm	1 number

Laserprinter	300dpi, paper size:A4, letter, legal	2 numbers
Photocopier	Copy size: A3(max), 30sheets/min(A4)	2 numbers
6. Educational and Extention Equipment		
Video camera	8mm, 3CCD	1 number
Video light	Halogen, DC24V, 200W	1 number
Monitor	14" color	1 number
Slide projector	53.5~100mm	1 number
OHP	Stage:250x250mm	1 number
Screen for projector	1,800x1,800mm	2 numbers
PA system	Audio mixer, amplifier, speakers, microphones	1 set
Audio cassette recorder	Dual cassette recorder/player	1 number
Video editor	8mm, dual deck w/title keyboard, editing controller	1 number
Video projector	Projected picture size: 100"	1 number
Color television	29" television, w/rack, video cassette player	1 number
7. Aquaculture Equipment		
Filter housing	φ200x850mm, SUS316, 0.5~25μm	5 numbers
Sand filter	60cu. m/hour	2 numbers
UV water sterilizer	60cu. m/hour	2 numbers
Shield net	Shield rate: 85~90%, 2mx50m	60 rolls
Hose and tube	Braided hose, flexible hose, vinyl tube	1 lot
Water pump	3 cu. m/min, seawater pump	4 numbers
Water pump	1 cu. m/min, seawater pump	2 numbers
Water pump	0.1 cu. m/min, freshwater pump	2 numbers
Fishculture cages	2m x 2m x 4 cages	6 sets
	4m x 4m x 4 cages	6 sets
Cage nets	2m x 2m x 2m, mesh size: 2, 3, 5mm	ea 24 nets
	4m x 4m x 4m, mesh size: 5, 8, 10, 15, 20, 30, 40mm	ea 24 nets
Pen nets	4m x 200m, mesh size: 5, 10mm	ea 5 rolls
	4m x 200m, mesh size: 20, 30, 40mm	ea 10 rolls
Spare sheets for repairing pond	1.5m x 20m, thickness: 1.5mm	20 rolls
FRP compound water tank	φ6,000mm x 1,000mm	12 sets
Rope	Nylon, φ7, 10mm x 200m	ea 20 rolls
Emergency generator	50KVA	1 number
Overhead tank	FRP, 8cu. m	2 numbers
	FRP, 2cu. m	1 number
Material for pipeing system modification	Pipes, valves, elbows, etc.	1 lot
Materials for electrical work	Cables, conduits, control panels, etc.	1 lot
Livingfish tank	Polyethylene, 500l	1 number
8. Workshop Equipment		
Bench drilling machine	13mm, 200W	1 number
Electric drills	6.5, 13 mm	1 set
Electric grinder	φ100mm	1 set
Hand tools	Plane, files, vise, cutting pliers, wrenches, screw drivers, et	1 lot
Safety goods	Helmets, goggles, masks	1 lot
High pressure washer	40kg/sq. m, 24 liters/min	1 number
Stepladder	Aluminum 4,000L mm	1 number
Tool wagon	1,000 x 600 x 880mm	1 number
Carts	1,200 x 700mm, loadings: loading capacity: 700kg	2 numbers

9. Boats, Vehicles & Others

Boat for lagoon research	Pneumatic boat, : length 5m. width 2m	1 number
Boat for shallow water research	FRP, length 7.5m. width 2.5m	1 number
Outboard motors	40ps, 15ps	2 numbers
Trailers	For lagoon research boat & shallow water research boat	1 number
Wagon type vehicle	4WD, diesel, 2,400cc, 5 seater, w/winch	1 number
Pick-up truck	4WD, diesel, 2,500cc, w/winch	1 number
Mini-bus	Diesel, 2,400cc, 15 seater	2 numbers

10. Furniture

Desks, chairs, cabinets, tables 1 lot

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