

APPENDICES

[Appendices]

[Appendices-I]

1. Member List of the Study Team

(1) Preparatory Survey

	Position	Name	Organisation
1	Team Leader	Hayato SHIRASE	Senior Advisor to the Director General, Rural Development Department, Japan International Cooperation Agency (JICA)
2	Coordinator	Hisashi SUZUKI	Senior Program Officer (Latin America and the Caribbean), Field Crop Based Farming Area Division I, Field Crop Based Farming Area Group, Rural Development Department, JICA
3	Project Manager / Fishery Products Distribution / O&M Planning	Tamotsu TOMIYAMA	System Science Consultants Inc.
4	Civil Engineering Planning / Natural Condition Survey	Yasuhito MANO	Senc 21 Inc.
5	Architectural Design	Masahiko WATANABE	System Science Consultants Inc.
6	Environmental and Social Consideration	Yuki NAKAZAWA	System Science Consultants Inc.
7	Equipment Planning / Facility Planning	Masakazu ISHII	System Science Consultants Inc.
8	Procurement Planning/ Construction Planning/Cost Estimation	Takehide SEKI	System Science Consultants Inc.

(2) Explanation on Draft Final Report

	Position	Name	Organisation
1	Team Leader	Hayato SHIRASE	Senior Advisor to the Director General, Rural Development Department, JICA
2	Project Manager / Fishery Products Distribution / O&M Planning	Tamotsu TOMIYAMA	System Science Consultants Inc.
3	Civil Engineering Planning / Natural Condition Survey	Yasuhito MANO	Senc 21 Inc.
4	Architectural Design	Masahiko WATANABE	System Science Consultants Inc.

2. Study Schedule

(1) Preparatory Survey

No	Day	Week	(Official) * Project Leader (JICA) * Coordinator (JICA)	Project Manager Fisheries Marketing/ Operation and Management Planning	Port Engineering/ Natural Condition Survey	Architectural Facilities Planning	Environment and Socio Consideration	Equipment Planning/ Facilities Planning	Construction Procurement/ Cost Estimation		
			A) H. SHIRASE/H. SUZUKI	B) T. Tomiyama	C) Y. MANO	D) M. WATANABE	E) Y. NAKAZAWA (Niimura)	F) M. ISHII	G) T. SEKI		
1	4-Jan	Sun.		NRT->JFK JL 006 (NRT, 11:30/JFK, 10:05) EWR->POS DL 485 (EWR, 14:35/POS, 20:34)	NRT->EWR (New York/ Newark L) CO 008 (NRT, 17:45/EWR, 16:25)						
2	5-Jan	Mon.		Courtesy Call to EOJ	EWR->Antigua CO 849 (EWR, 9:05/Antigua, 14:40)						
3	6-Jan	Tue.		POS->Antigua, BW 414 (POS, 8:00/Antigua, 10:30) Courtesy call to DoF, ICR Explanation in Antigua	Prep. of Natural Condition Survey	ICR Explanation in Antigua, Adjustment Survey Schedule	Prep. of Environment and Socio Consideration Survey				
4	7-Jan	Wed.		Courtesy call to Ministry, ICR Explanation in Antigua, Visiting related facilities and stakeholders	Ditto, Design Condition Survey	Ditto, visiting related facilities and stakeholders	Ditto, visiting related facilities and stakeholders				
5	8-Jan	Thur.		Antigua->Barbuda ICR Explanation in Barbuda, Site Survey, Baseline Survey of Fisheries Activities	Antigua->Barbuda Adjustment Natural Condition Survey	Antigua->Barbuda ICR Explanation in Barbuda, Site Survey	Antigua->Barbuda ICR Explanation in Barbuda, Site Survey				
6	9-Jan	Fri.		Site Survey, Baseline Survey of Fisheries Activities	Natural Condition & Site Survey	Facility Design and Design Condition Survey	Environment and Socio Consideration Survey				
7	10-Jan	Sat.		Ditto	Ditto	Ditto	Ditto				
8	11-Jan	Sun.		Team Meeting Barbuda->Antigua	Team Meeting Facility Layout Related	Team Meeting Facility Layout Related	Barbuda->Antigua Team Meeting Environment & Socio Condition Related			NRT->JFK JL 006 (NRT, 11:30/JFK, 10:05) EWR->POS CO 1878 (JFK, 14:30/POS, 20:59)	
9	12-Jan	Mon.		Operation & Management Survey in Antigua	Natural Condition & Site Survey	Facility Design and Design Condition Survey	Meeting with Lagoon Management Related.			Equipment & Facilities Planning Survey	Construction & Procurement Survey
10	13-Jan	Tue.		Ditto Team Meeting	Ditto	Barbuda->Antigua Team Meeting	Meeting with Environmental Dept.			POS->Antigua BW 414 (POS, 8:00/Antigua, 10:30) Team Meeting	
11	14-Jan	Wed.		Meeting with Fisheries Office/ Organization & Staff Plan	Ditto	Facility Design and Design Condition Survey	Antigua->Barbuda Support & Prep. / No.1- Stake Holder Meeting			Equipment & Facilities Planning Survey	Construction & Procurement Survey
12	15-Jan	Thur.		Baseline Survey of Fisheries Activities	Ditto	Ditto	Ditto			Ditto	Ditto
13	16-Jan	Fri.		Barbuda <->Antigua No.1-Stake Holder Meeting	Meeting with Barbuda Council/ Relation of Sightseeing Activities	Ditto	No.1-Stake Holder Meeting / Survey Analysis			Ditto	Ditto
14	17-Jan	Sat.		Adjustment of Study Progress / Facility & Equipment	Barbuda->Antigua Civil Design Study	Building Design Study	Barbuda->Antigua Study of Environment Impact Management			Equipment & Facilities Design Study	Basic Construction Cost Study
15	18-Jan	Sun.	Team Meeting Study of Alternative Plan / Civil, Building, Equipment, Facilities								
16	19-Jan	Mon.	NRT->JFK *** (NRT, **/JFK, **)	Study of Operation & Management System	Civil Design & Design Condition Survey	Study of Operation & Management Cost	EIA Related Survey	Antigua->Barbuda Site Survey			
17	20-Jan	Tue.	JFK->Antigua *** (JFK, **/Antigua, **)	Basic Cost Items Analysis for Operation & Management	Ditto	Study of Operation & Management System	Ditto	Equipment & Facilities Design Survey	Construction & Procurement Survey		
18	21-Jan	Wed.	Visit to MOF, Minister of Barbuda and Related Div./ Meeting with Fisheries Office	Study for Soft Component Team Meeting	Ditto Team Meeting	Meeting with Fisheries office for Facility Components	Ditto Team Meeting	Fish Transportation Survey (Lobster, Fish)	Ditto		
19	22-Jan	Thur.	Antigua->Barbuda Visit to Barbuda Council, Site Survey	Meeting with Fisheries office for Civil Components	Meeting with Public Works	Meeting with EIA Related/ Data Correction	Barbuda->Antigua Equipment & Facilities Design Survey	Barbuda->Antigua Construction & Procurement Survey			
20	23-Jan	Fri.	Team Meeting Discussion of Minutes	<- Study of Civil Design	<- Study of Building Design	<- Study of Environment & Socio Related Matters	<- Ditto	<- Ditto			
21	24-Jan	Sat.	Survey / Point Warf Existing facility	Draft Planning	Draft Planning	Outline of Environment & Socio Related Matters	Draft Planning	Rough Estimation Cost			
22	25-Jan	Sun.	Team Meeting							<- Ditto	<- Ditto
23	26-Jan	Mon.	Discussion of Minutes							Equipment & Facilities Design Survey	Construction & Procurement Survey
24	27-Jan	Tue.	Signing of Minutes			Civil Design & Design Condition Survey	Facility Design and Design Condition Survey/Infrastructure	Correction of Baseline Survey Sheet No.2-Stake Holder Meeting	Ditto	Ditto	
25	28-Jan	Wed.	Antigua->POS Visit to EOJ	Barbuda <->Antigua No.2-Stake Holder Meeting	<- Ditto	<- Ditto	<- Ditto	Ditto	Ditto		
26	29-Jan	Thur.	POS->JFK-> (*****)	Confirmation of Survey Items	Adjustment of Natural Condition Survey	Operational Related Code & Regulation	Barbuda->Antigua Document Analysis	Ditto	Ditto		
27	30-Jan	Fri.	-> NRT	Additional Survey	Additional Survey	Additional Survey	Additional Survey	Additional Survey	Additional Survey		
28	31-Jan	Sat.	Antigua->EWR (New York/ Newark L) CO 849 (Antigua, 15:35/EWR, 19:27)								
29	1-Feb	Sun.	JFK-> JL 005 (JFK, 12:10->)	EWR-> CO 009 (EWR, 11:10/NRT->)			JFK-> JL 005 (JFK, 12:10->)				
30	2-Feb	Mon.	>NRT (16:20)			>NRT (15:10)		>NRT (16:20)			

Remarks. NRT:Narita (Japan), JFK:Jhon F Kennedy (New York), POS: Port of Spain (TRINIDAD AND TOBAGO), EOJ: Embassy of Japan, MOF:Ministry of Foreign Affairs

(2) Explanation on Draft Final Report

No	Day	Week	(Official) Project Leader : JICA	Project Manager Fisheries Marketing/ Operation and Management Planning	Port Engineering/ Natural Condition Survey	Architectural Facilities Planning
			A) Leader : H. SHIRASE	B) T. Tomiyama	C) Y. MANO	D) M. WATANABE
1	17-May	Sun.	NRT 16:35 (CO 008) → NWR 16:30	←	←	←
2	18-May	Mon.	NWR 12:40 (CO 472) → SUN JUAN 16:29 SUN JUAN 19:35 (AA 5042) → Antigua 21:01	←	←	←
3	19-May	Tue.	* Explanation the Draft report to Fisheries Division in Antigua	←	←	←
4	20-May	Wed.	* Receiving the question of Draft report and answer. * Discussion of Minutes of meeting	←	Antigua→Barbuda→ Antigua * Additional Survey	As same as Project Manager
5	21-May	Thur.	* Signing the minute of meeting	←	←	Additional Survey
6	22-May	Fri.	Antigua 07:16 (AA 5053) → Sun Juan 8:50 Sun Juan 14:20 (CO 466) → NWR 18:30	←	←	←
7	23-May	Sat.	NWR 11:10 (CO 009) →	←	←	←
8	24-May	Sun.	Arrive at NRT 13:55	←	←	←

3. List of Parties Concerned in the Recipient Country

Name	Position	Organisation
Ministry of Agriculture, Lands, Marine Resources & Agro-Industries (during Field Survey)		
Ministry of Agriculture, Lands, Housing and the Environment (during Explanation on Draft Final Report)		
Hon. Joanne M. Massiah	Minister of Agriculture, Lands, Marine Resources & Agro-Industries (during Field Survey)	Ministry of Agriculture, Lands, Marine Resources & Agro-Industries
Hon. Hilson N. Baptiste	Minister of Agriculture, Lands, Housing & Environment (during Explanation on Draft Final Report)	Ministry of Agriculture, Lands, Housing & Environment
Clarence Pilgrim	Permanent Secretary (during Explanation on Draft Final Report)	Ministry of Agriculture, Lands, Housing & Environment
Cheryl Jeffrey-Appleton	Chief Fisheries Officer	Fisheries Division, Ministry of Agriculture, Lands, Marine Resources & Agro-Industries
Philmore James	Deputy Fisheries Officer	ditto
Ian Horsford	Sr. Fisheries Officer	ditto
Tricia Lovell	Fisheries Officer	ditto
Hilroy Simon	Fisheries Assistant	ditto
Mitsuhiro Ishida	JICA Expert	ditto
Ministry of Foreign Affairs		
Anthony Liverpool	Ambassador to Japan	Ministry of Foreign Affairs
Barbuda Council		
Fabian Jones	Chairman	Barbuda Council
Kelvin Punter	Chairperson of Fisheries Committee	Barbuda Council
Hartford John	Chairperson of Health Committee Deputy Chairperson of Fisheries Committee	Barbuda Council
R.J.S. Beazer	Chairperson of Finance Deputy Chairperson of Fisheries Committee	Barbuda Council
Courter Burton	Chairperson of Tourism	Barbuda Council
Claude Burton	Solid Waste Management Officer	
John Webber	Fisheries Office Manager	
Other Ministries		
Hon. Trevor Walker	MP for Barbuda	
Philmore G. Mullin	Deputy Director	National Office of Disaster Services, Ministry of Labour, Cooperatives & Public safety
Wesley A. James	Chief Architect	Ministry of Public Works

Name	Position	Organisation
Denzil Solomon	Chief Town and Country Planner	Development Control Authority (DCA)
Wilbert Burke	Senior Building Inspector	Development Control Authority (DCA)
Reg. Murphy, Dr.		National Park Authority
Lionel Michael	Chief Public Health Inspector	Central Board of Health, Ministry of Health
Gerorry Urlwin	Cpartain	Burbudaexpress
Ivan Rodorigyues	Water Manager	APUA (Antigua Public Utilities Authority)
Danieo I. Aburime	Mechanical Engineer for Barbuda	APUA (Antigua Public Utilities Authority)
Whitfield Joshua	Superintendent	Antigua Fire Station
Dale C.S.Destin	Climatologist	Antigua and Barbuda Meteorological Services
Adelle Blair	Chief Environmental Officer	Environment Division, Ministry of Tourism, Culture, Civil Aviation and the Environment
Melesha Banhan	Senior Environment Technician	Environment Division, Ministry of Tourism, Culture, Civil Aviation and the Environment
NGO		
Joseph Prosper		EAG (Environmental Awareness Group)
Rev. Karen Brotherson	Office manager	Health Hope & HIV Foundation
Private Sector		
John Mussington	Principal of Barbuda Secondary School Marine Biologist	
Lynton Thomas	Rep. of Land taxi, Barbuda Lagoon Management Board	
Calvin Gore	Representative of Sea Taxi, Barbuda Lagoon Management Board	
David H. Milner	Civil Engineer	Terrasearch Caribbean Ltd.
David R. Hart	Soil Consultant	Caribbean Testing & Engineering Laboratory
J. Mario Bento	Managing Director	Caribbean Water Treatment Ltd.
Camaria Holder	Project Engineer	Caribbean Water Treatment Ltd.
David Neal	Hydrographic Surveyor	CANE Associates Co.Ltd
Navin Singh	Project Manager	DEVCON Ltd.
Kenji Nakano		Toa Corporation
Mavis George	Manager	Antigua Fisheries Limited
Embassy of Japan, Trinidad and Tobago		
Tetsuya Sato	Second Secretary, Economic Cooperation Section	Embassy of Japan, Trinidad and Tobago
Mariko Chiba	Second Secretary, Economic Cooperation Section	Embassy of Japan, Trinidad and Tobago

4. Minutes of Discussions

(1) Preparatory survey stage

MINUTES OF DISCUSSIONS
ON THE PREPARATORY SURVEY
ON THE PROJECT FOR CONSTRUCTION OF ARTISANAL FISHERIES FACILITIES
IN BARBUDA
IN THE STATE OF ANTIGUA AND BARBUDA

Based on the results of the Preliminary Study, the Government of Japan decided to conduct a Preparatory Survey on the Project for Construction of Artisanal Fisheries Facilities in Barbuda (hereinafter referred to as "the Project") and entrusted the survey to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to Antigua and Barbuda the Preparatory Survey Team (hereinafter referred to as "the Team"), which is headed by Mr. Hayato SHIRASE, Senior Advisor to Director General, Rural Development Department, and is scheduled to stay in the country from 5th to 31st January, 2009.

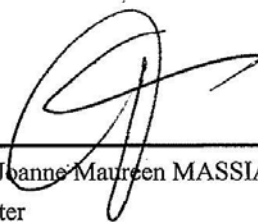
The Team held discussions with the government officials of the Government of Antigua and Barbuda (hereinafter referred to as "GOAB") and conducted a field survey at the survey area.

In the course of discussions and field survey, both parties confirmed the main items described on the attached sheets. The Team will proceed to further works and prepare the Preparatory Survey Report.

St. John's, 27th January, 2009



Mr. Hayato SHIRASE
Leader
Preparatory Survey Team
Japan International Cooperation Agency
(JICA)



Hon. Joanne Maureen MASSIAH
Minister
Ministry of Agriculture Lands, Marine
Resources & Agro Industries
Antigua and Barbuda

ATTACHMENT

1. Objective of the Project

The objective of the Project is to improve artisanal fisheries in Barbuda.

2. Project site

The site of the Project is in Codrington, Barbuda, as shown in ANNEX-1.

3. Responsible and Implementing Agency

3-1. The Responsible Agency is the Ministry of Agriculture, Lands, Marine Resources and Agro-Industries.

3-2. The Implementing Agency is the Fisheries Division, Ministry of Agriculture, Lands, Marine Resources and Agro-Industries.

3-3. The organizational charts of the Agencies are shown in ANNEX-2.

4. Items requested by the GOAB

After discussions with the Team, the items described in ANNEX-3 represent final request of the GOAB. JICA will assess the appropriateness of the request and will recommend to the Government of Japan for approval.

5. Japan's Grant Aid Scheme

The GOAB understands the Japan's Grant Aid Scheme and the necessary measures to be taken by the GOAB as explained by the Team and described in ANNEX-4 and ANNEX-5 of the Minutes of Discussions signed by both parties on 2nd September, 2008. The Team explained that there would be some changes on the procedures of Japan's Grant Aid scheme and that the renewed procedures will be explained by JICA in near future.

6. Schedule of the Study

6-1. The consultants will continue further studies in Antigua and Barbuda until 31st January, 2009.

6-2. JICA will prepare the draft report in English and dispatch a mission in order to explain its contents in May, 2009.

6-3. Once the contents of the report are accepted in principle by the GOAB, JICA will complete the final report and send it to the GOAB by August, 2009.

7. Other relevant issues

7-1. Environmental Impact Assessment

Both parties confirmed that EIA report is not required for the execution of this Project, since the study present being conducted is comprehensive and contains all the necessary parameters for EIA. (referred to ANNEX-6)



7-2. Land issues

7-2-1 The Team confirmed that the Project site is the vacant land.

7-2-2 The Team confirmed that the permission to use the land of Project site shown in ANNEX-1 has been issued by Barbuda Council as attached in ANNEX-7.

7-2-3 If any land issues arise among the interested parties, the GOAB shall resolve them immediately and report the result to the Embassy of Japan in Trinidad & Tobago.

7-3 Operation and Management of new Fisheries Complex

The GOAB shall allocate the necessary budget and staff for the operation and management of the new Fisheries Complex in Barbuda. The organization chart of the new Fisheries Complex is attached as ANNEX-8.

7-4 Construction and Development Permission

7-4-1. The GOAB shall complete all necessary arrangements to obtain the construction permission prior to the construction of the facilities, if the Project is to be implemented.

7-4-2. The GOAB shall complete all necessary arrangements to obtain the development permission prior to the construction of the facilities, if the Project is to be implemented.

7-5 Stakeholder Meeting

The GOAB shall convene future stakeholder meetings from time to time in order to ensure full comprehension and endorsement by the relevant stakeholders.

7-6 Monitoring

Both parties confirmed that the Fisheries Division is the responsible organization for monitoring the Project under the environmental mitigation plan during the Preparatory Survey and construction periods and after the completion of the construction.

7-7 Undertaking by the GOAB

The Team confirmed that the GOAB has already secured the budget for the undertaking of the Project as shown in ANNEX-9.

ANNEX-1: Project Site

ANNEX-2: Responsible and Implementing Agency

ANNEX-3: Items requested by the Government of Antigua and Barbuda

ANNEX-4: Japan's Grant Aid Scheme

ANNEX-5: Major Undertakings to be taken by Each Government

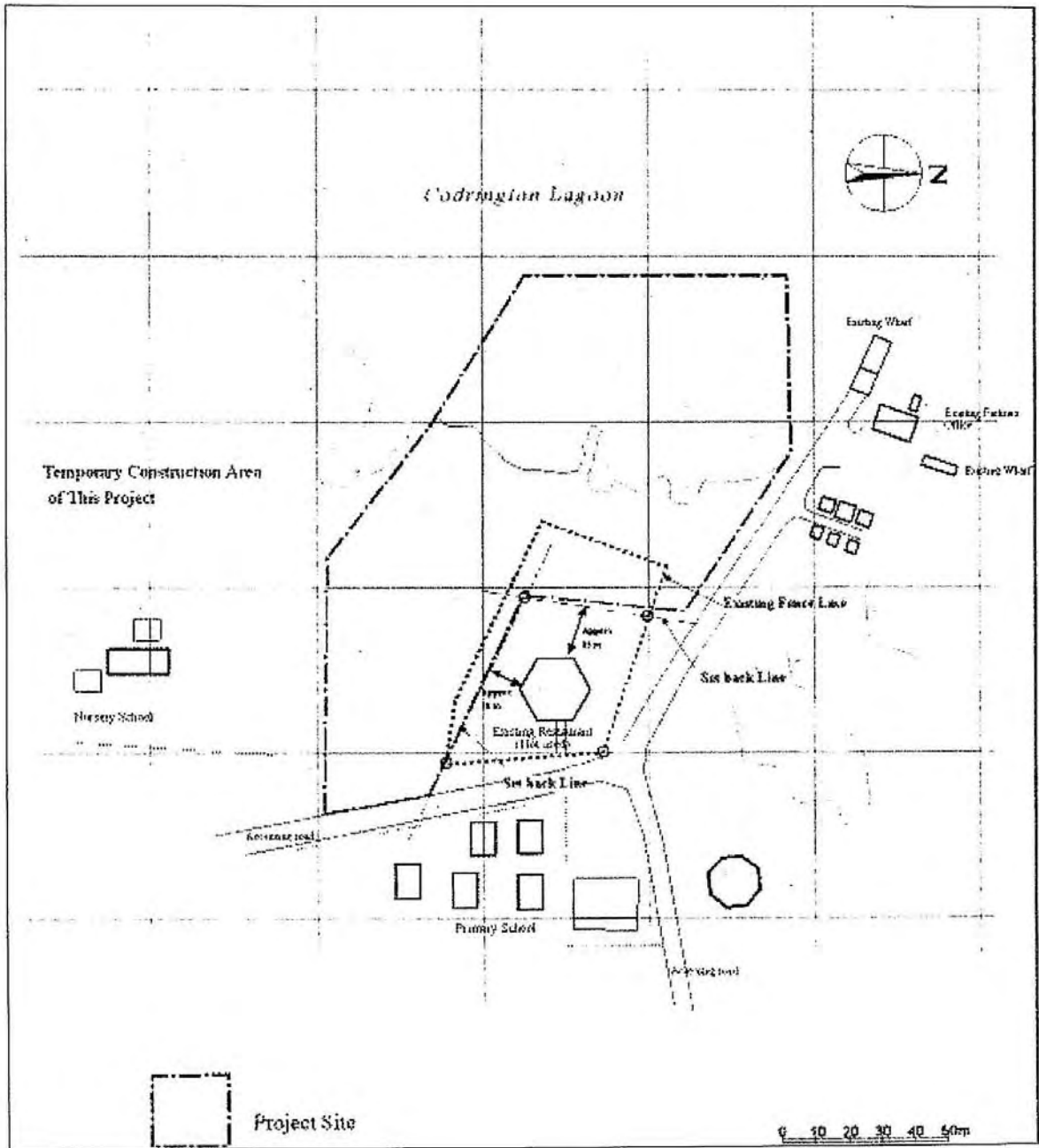
ANNEX-6: Environment Impact Assessment

ANNEX-7: Land use permission

ANNEX-8: Organization chart of new Fisheries Complex in Barbuda

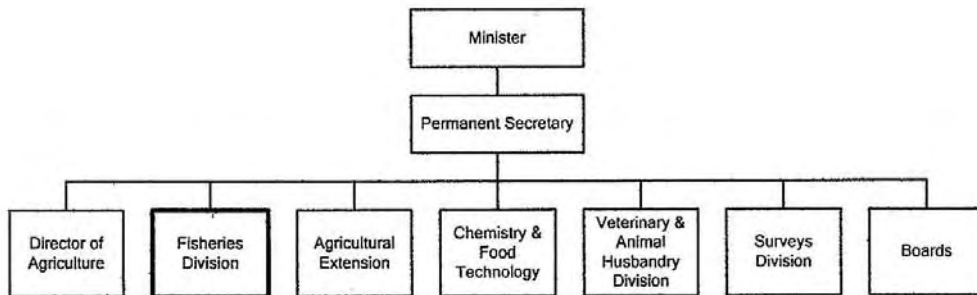
ANNEX-9: Budget for undertaking by GOAB



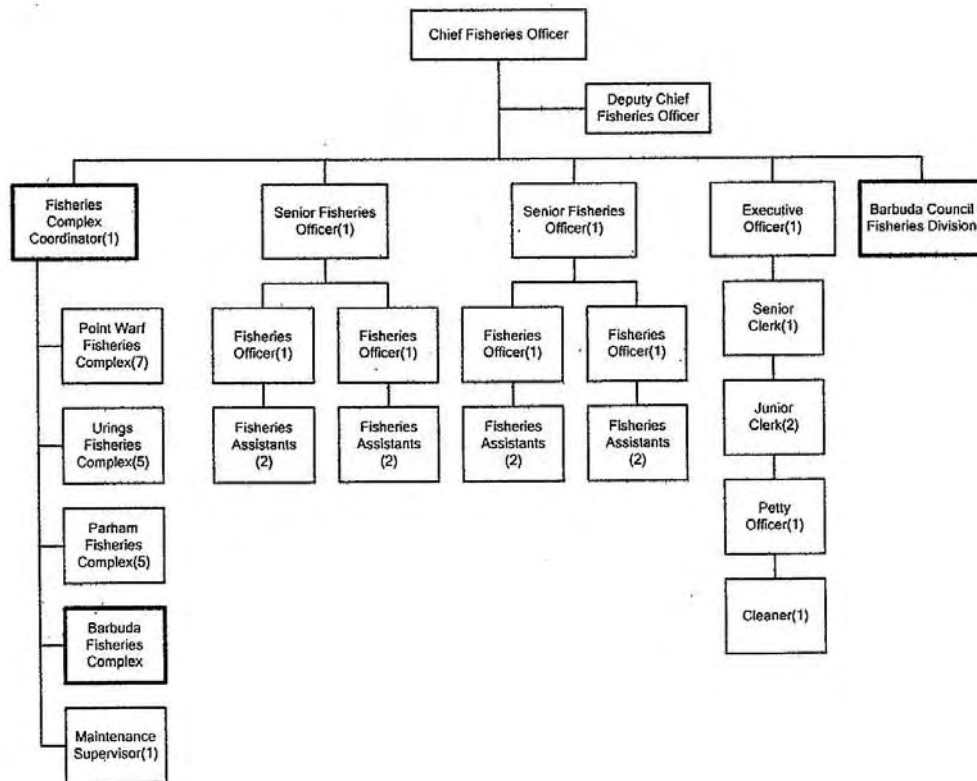


⑤

Ministry of Agriculture, Lands, Marine Resources and Agro Industries



Fisheries Division



Ⓠ Ⓡ

COMPONENTS REQUESTED BY THE GOVERNMENT OF ANTIGUA AND BARBUDA

The definition of priority

A: Necessary, B : Less necessary than "A", C : Unnecessary (It is not an object of Basic Design Study)

Item	Components	Priority
	Facilities	
1	Landing and mooring wharf	A
2	Ice making machine	A
3	Ice storage	A
4	Cold storage	A
5	Fishing gear lockers	A
6	Slipway	A
7	Internal Road	A
8	Workshop	A
9	Sewage system (septic tank)	A
10	Back-up generator	A
11	Meeting room/classroom (30 persons)	A
12	Fish handling shed/processing room/test room	A
13	Building for Administration office /Ice making room and Cold storage/bed rooms with kitchen	A
14	Fishing gear shop	A
15	Toilet and shower for fisherfolks	A
16	Water tank for ice machine	A
17	Water tank for general	A
18	Parking lots	A
19	Provision for fuel depot	A
20	Net Shed	A
21	External lighting	A
	Equipment	
1	Insulated fish box	A
2	Fish tray	A
3	Platform scale (balance)	A
4	Spring scale	C
5	Bincart	A
6	Pressure Washer	A
7	Tools for repair of equipment	A

8	Chain hoist for workshop	A
9	Fish handling table	A
10	AV equipment for meeting room	C
11	Sampling and testing equipment	A
12	Equipment for meeting/classroom to accommodate 30 persons	C
13	Over Head Crane on Wharf	A
14	Trolley Jacks	A
15	Radio communication (VHF)	A

⑥

②

Japan's Grant Aid Scheme

The Grant Aid Scheme 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. The Grant Aid is not supplied through the donation of materials as such.

A. Grant Aid Procedure

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

Application	(Request made by a recipient country)
Study	(Preparatory Study and Basic Design Study conducted by JICA)
Appraisal & Approval	(Appraisal by the Government of Japan and Approval by Cabinet)
Determination of Implementation	(The Notes exchanged between the Governments of Japan and the recipient country)

2) Firstly, the application or request for a Grant Aid project 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 Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA to conduct a study on the request. If necessary, JICA send a Preparatory Study Team to the recipient country to confirm the contents of the request.

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

Thirdly, the Government of Japan appraises the project to see whether or not it is suitable for Japan's Grant Aid Programme, based on the Basic Design Study report prepared by JICA, and the results are then submitted to the Cabinet for approval.

Fourthly, the project, once approved by the Cabinet, becomes official with the Exchange of Notes signed by the Governments of Japan and the recipient country.

Finally, for the implementation of the project, JICA assists the recipient country in such matters as preparing tenders, contracts and so on.

B. Basic Design Study

1) Contents of the Study

The aim of the Basic Design Study (hereinafter referred to as "the Study"), conducted by JICA on a

requested project (hereinafter referred to as "the Project"), is to provide a basic document necessary for the appraisal of the Project by the Government of Japan. The contents of the Study are as follows:

- a) Confirmation of the background, objectives and benefits of the Project and also institutional capacity of agencies concerned of the recipient country necessary for the Project's implementation;
- b) Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from the technical, social and economic points of view;
- c) Confirmation of items agreed on by both parties concerning the basic concept of the Project;
- d) Preparation of a basic design of the Project; and
- e) Estimation of 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 through the Minutes of Discussions.

2) Selection of Consultants

For the smooth implementation of the Study, JICA uses a Japanese consulting firm selected through its own procedure (competitive proposal). The selected firm participates the Study and prepares a report based upon the terms of reference set by JICA.

At the beginning of implementation after the Exchange of Notes, for the services of the Detailed Design and Construction Supervision of the Project, JICA recommends the same consulting firm which participated in the Study to the recipient country, in order to maintain the technical consistency between the Basic Design and Detailed Design as well as to avoid any undue delay caused by the selection of a new consulting firm.

C. Japan's Grant Aid Scheme

1) What is 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.

(b) (A)

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) "The period of the Grant" 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) Under the Grant, 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 and 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 of Japanese taxpayers.

6) Undertakings required to the Government of the recipient country

- a) To secure a lot of land necessary for the construction of the Project and to clear the site;
- b) To provide facilities for distribution of electricity, water supply and drainage and other incidental facilities outside the site;
- c) To ensure prompt unloading and customs clearance at ports of disembarkation in the recipient country and internal transportation therein of the products purchased under the Grant Aid;
- d) To exempt Japanese nationals from customs duties, internal taxes and fiscal levies, which may be imposed in the recipient country with respect to the supply of the products and services under the verified

(b) (X)

contracts;

e) 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 work;

f) To ensure that the facilities constructed and products purchased under the Grant Aid be maintained and used properly and effectively for the Project; and

g) To bear all the expenses, other than those covered by the Grant Aid, necessary for the Project.

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 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 should open an account in the name of the Government of the recipient country in an authorized foreign exchange bank in Japan (hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the verified contracts.

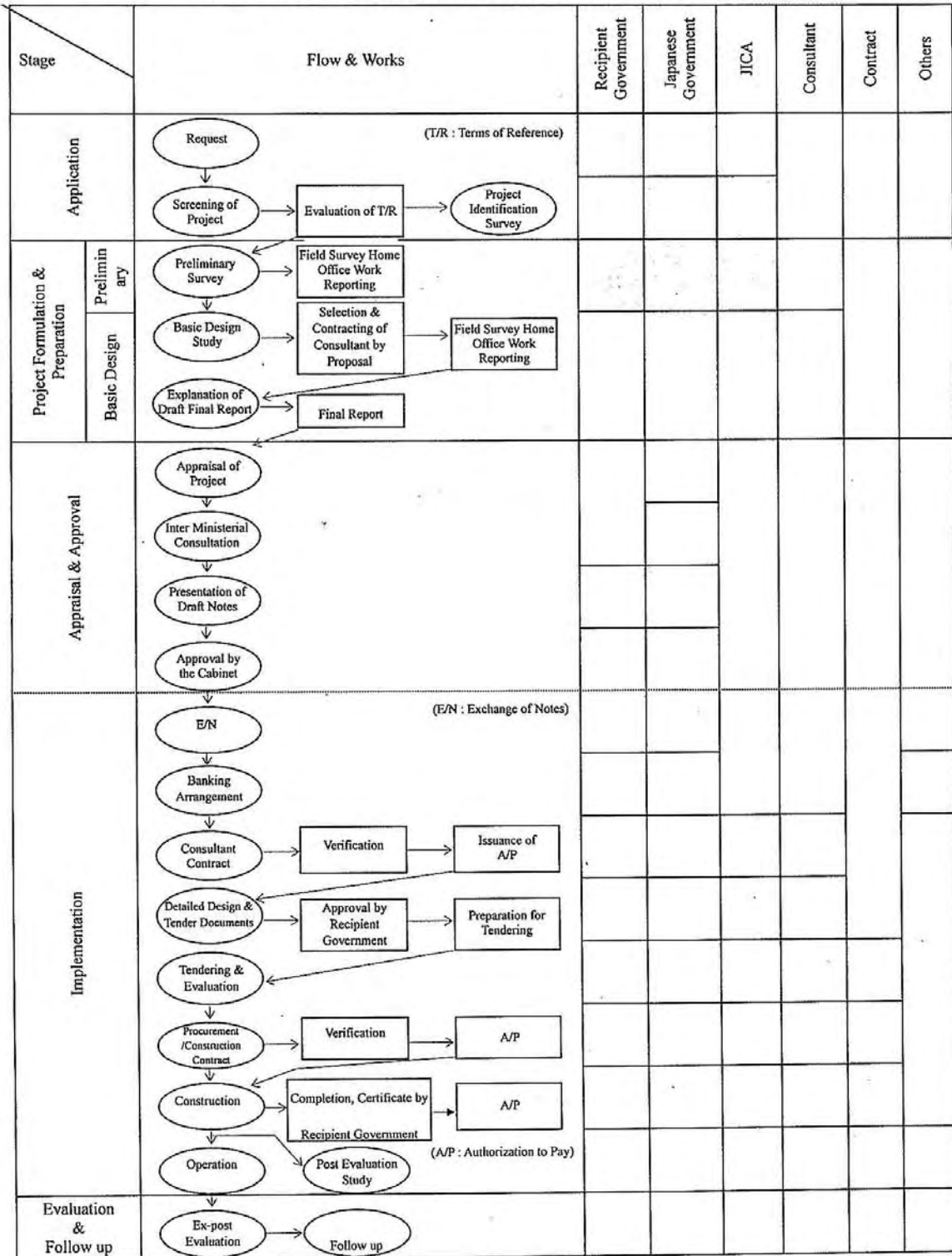
b) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an Authorization to Pay (A/P) issued by the Government of recipient country or its designated authority.

10) Authorization to Pay (A/P)

The Government of the recipient country should bear an advising commission of an Authorization to Pay and payment commissions to the Bank.

(6) (A)

FLOW CHART OF JAPAN'S GRANT AID PROCEDURES



(6)

Major Undertakings to be taken by Each Government

No.	Items	To be covered by Grant Aid	To be covered by Recipient Side
1	To secure land		•
2	To clear level and reclaim the site when needed		•
3	To construct gates and fences in and around the site		•
4	To construct the parking lot	(•)	•
5	To construct roads		
	1) Within the site	•	
	2) Outside the site		•
6	To construct the building	•	
7	To provide facilities for the distribution of electricity , water supply , drainage and other incidental facilities		
	1) Electricity		
	a) The distributing line to the site		•
	b) The drop wiring and internal wiring within the site	•	
	c) The main circuit breaker and transformer	•	
	2) Water Supply		
	a) The water distribution main to the site		•
	b) The supply system within the site (receiving and elevated tanks)	•	
	3) Drainage		
	a) The drainage main(for storm sewer and others to the site)		•
	b) The drainage system (for toilet sewer, ordinary waste, storm drainage and others) within the site	•	
	4) Gas Supply		
	a) The gas main to the site		•
	b) The gas supply system within the site	•	
	5) Telephone System		
	a) The telephone trunk line to the main distribution frame/panel (MDF) of the building		•
	b) The MDF and the extension after the frame/panel	•	
	6) Furniture and Equipment		
	a) General furniture		•
	b) Project equipment	•	
8	To bear the following commissions to the Japanese foreign exchange banking services based upon the B/A		
	1) Advising commission of A/P		•
	2) Payment commission		•
9	To ensure unloading and customs clearance at port of disembarkation in recipient country		
	1) Marine (Air) transportation of the products from Japan to the recipient country	•	
	2) Tax exemption and custom clearance of the products at the port of disembarkation		•
	3) Internal transportation from the port of disembarkation to the project site	(•)	•
10	To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contract such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work		•
11	To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the supply of the products and services under the verified contracts		•

12	To maintain and use properly and effectively the facilities contracted and equipment provided under the Grant		•
13	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 installation of the equipment		•

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ANNEX-6

GOVERNMENT OF ANTIGUA AND BARBUDA

Development Control Authority

Cross Street
Cecil Charles Building
P.O. BOX 895
ST. JOHN'S, ANTIGUA. West Indies

Tel: (268) 462-2038/4534
462-6426/6427

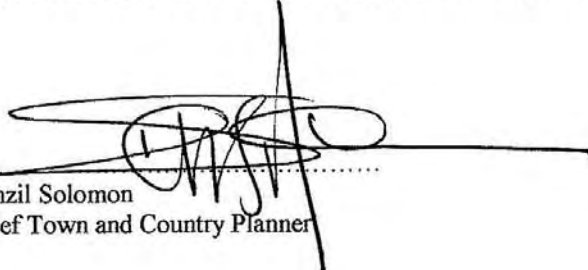
January 27, 2009

Cheryl Appleton
Chief Fisheries Officer
Fisheries Division
Ministry of Agriculture, Lands,
Marine Resources & Agro-Industry
Point Wharf, Lower North Street
St. John's
Antigua

Dear Mrs. Cheryl Appleton:

The Fisheries Division as the executing agency of the planned Fisheries Complex in Barbuda as well as the agency in charge of preparation of the Environment Impact Assessment report is hereby advised that the DCA would accept the Basic Design report prepared by JICA Preparatory Study Team in lieu of such report.

The Basic Design report includes information which would meet the necessary requirements for EIA as elucidated in current legislation. In the event further information is requested at a future date, the Fisheries Division would be responsible for providing the required information.


Denzil Solomon
Chief Town and Country Planner

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BARBUDA LOCAL GOVERNMENT

Correspondence on this matter should be addressed to:

**THE BARBUDA COUNCIL,
Codrington Village Barbuda,
Via St. John's Antigua W. I.
Tel: (268) 460-0077/562-1921
Fax: (268) 460-0410/460-0001
E-Mail: barbudacouncil@bactol.net**

BC/15A/09

Ref. No.....

26th January 2009

.....20.....

Cheryl Appleton
Chief Fisheries Officer
Ministry of Agriculture, Lands, Marine Resources and Agro-Industry
Point Wharf Fisheries Complex
Point Wharf
St. John's, Antigua

Dear Sir/Madam,

The Barbuda Council under the provisions of Article 12.1 Subsection g, of the Barbuda Land Act 2007, hereby grants permission to erect and construct a Fisheries Complex on the proposed project site in Codrington as per Annex 1 here with attached.

Respectfully,

**SECRETARY
BARBUDA COUNCIL**

Dorothy Beazer Rae
Secretary
Barbuda Council

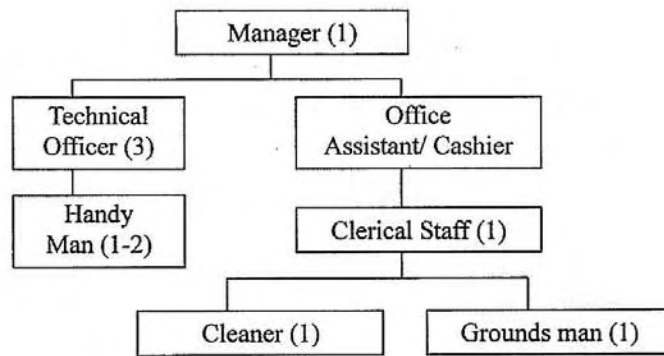
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BARBUDA COUNCIL

01/26/2009 15:11 FAX

ANNEX-8:

Organization chart of new Fisheries Complex in Barbuda



Budget for undertaking by GOAB

ANTIGUA DEVELOPMENT ESTIMATES - 2009
CAPITAL EXPENDITURE 20 Agriculture, Lands, Marine Resources & Agro-Industries

CODE	DESCRIPTION	BUDGET 2009	ORIGINAL 2008	REVISED 2008	ACTUAL 2007
	TOTAL DEPARTMENT 2004 Veterinary & Animal Husbandry	394,000	0	0	0
04	Fisheries Division				
	303 Fisheries				
	303667 Construction of Artisanal Fishing				
	Consolidated Fund				
40402	Purchase of Construction Supplies & Equipment	100,000	0	0	0
40404	Purchase of Fencing Materials	200,000	0	0	0
40515	Purchase of Utilities Infrastructure	100,000	0	0	0
41202	Contractors' Costs	100,000	0	0	0
	TOTAL ACTIVITY 303667 Construction of Artisanal Fishing Port - Barbuda	500,000	0	0	0
	303693 Fencing of Fisheries Complexes				
	Consolidated Fund				
40404	Purchase of Fencing Materials	310,000	0	0	0
	TOTAL ACTIVITY 303693 Fencing of Fisheries Complexes	310,000	0	0	0
	TOTAL PROGRAMME 303 Fisheries	810,000	0	0	0
	TOTAL DEPARTMENT 2004 Fisheries Division	810,000	0	0	0
05	Cotton Division				
	300 Personnel Direct				
	300320 Conservation Management				
	Consolidated Fund				
40101	Purchase of Vehicles	85,000	0	0	0
	TOTAL ACTIVITY 300320 Conservation Management	85,000	0	0	0
	300608 Purchase of Fencing				
	Consolidated Fund				
40404	Purchase of Fencing Materials	0	50,000	50,000	0
	TOTAL ACTIVITY 300608 Purchase of Fencing	0	50,000	50,000	0
	300811 Construction &/or Major Upgrade of Government Buildings				
	Consolidated Fund				
40201	Purchase of Office Furnishings	15,000	0	0	0
40202	Purchase of Computer Software & Hardware	6,000	0	0	0
40203	Purchase of Office Equipment	10,000	0	0	0
40301	Purchase of Air Conditioning	5,000	0	0	0

Source: 2009 Antigua and Barbuda Recurrent and Development Estimates (2008)

(2) Explanation of Draft Final Report Stage

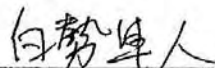
**MINUTES OF DISCUSSIONS
ON THE PREPARATORY SURVEY (BASIC DESIGN STUDY) ON
THE PROJECT FOR CONSTRUCTION OF ARTISANAL FISHERIES FACILITIES
IN BARBUDA
IN THE STATE OF ANTIGUA AND BARBUDA
(EXPLANATION OF DRAFT FINAL REPORT)**

In January 2009, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched a Preparatory Survey Team on the Project for Construction of Artisanal Fisheries Facilities in Barbuda (hereinafter referred to as "the Project") to Antigua and Barbuda, and through discussion, field survey, and technical examination in Japan, JICA prepared a draft report of the survey.

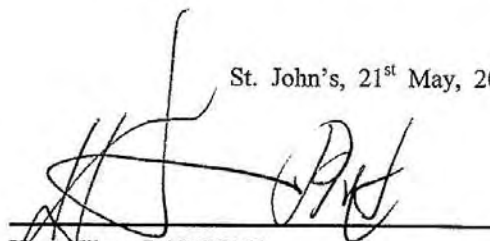
In order to explain and to discuss with officials of the Government of Antigua and Barbuda (hereinafter referred to as "GOAB") on the components of the draft report, JICA sent to Antigua and Barbuda, the Draft Final Report Explanation Team (hereinafter referred to as "the Team"), headed by Mr. Hayato SHIRASE, Senior Advisor to Director General, Rural Development Department, JICA, and was scheduled to stay in the country from 19th to 22nd May, 2009.

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

St. John's, 21st May, 2009



Mr. Hayato SHIRASE
Leader
Draft Final Report Explanation Team
Japan International Cooperation Agency
(JICA)



Hon. Hilson BAPTISTE
Minister
Ministry of Agriculture, Lands, Housing and
the Environment
Antigua and Barbuda

ATTACHMENT

1. Components of the Draft Final Report

The GOAB agreed and accepted in principle the components of the draft final report explained by the Team.

2. Japan's Grant Aid scheme

The GOAB understood the Japan's Grant Aid Scheme and the necessary measures to be taken by the GOAB as explained by the Team and described in Annex-4 and Annex-5 of the Minutes of Discussions signed by both parties on 27th January, 2009. The Team explained that after the procedures of Japan's Grant Aid scheme had been changed in October, 2008. Grant Agreement (G/A) will be now exchanged between the GOAB and JICA. The GOAB understood the explanation given by the Team about G/A shown as Annex-1.

3. Schedule of the Study

JICA will complete the final report in accordance with the confirmed items and send it to the Fisheries Division, Ministry of Agriculture, Lands, Housing and the Environment representing the GOAB by the end of June, 2009.

4. Confidentiality of the Project Cost Estimation

The Team explained the cost estimation of the Project as described in Annex-2. Both sides agreed that the Project Cost Estimation should never be duplicated or released to any outside parties before signing of all the Contract(s) for the Project. The GOAB understood that the Project Cost Estimation attached as Annex-2 is not final and is subject to change.

5. Other Relevant Issues

5-1. Construction Permission

The GOAB shall complete all necessary arrangements to obtain the construction permission prior to the construction of the facilities, if the Project is to be implemented.



5-2. Development Permission

The GOAB shall complete all necessary arrangements to obtain the development permission prior to the construction of the facilities, if the Project is to be implemented.

5-3. Water Quality Monitoring

The GOAB shall monitor the water quality items defined by the Wastewater Standard of the Eastern Caribbean states such as BOD, SS, pH, Chlorine, Bacillus coli and Enterococci for the wastewater discharged from the Project Facility 4 times a year. The results of the monitoring shall be informed to JICA Mexico during the construction period and for 2 years after the completion of the construction.

5-4. Undertaking by GOAB and JICA

Both sides confirmed that the undertaking by each side is as described in Annex-3

Annex Major Undertakings to be taken by Each Government

Major Undertakings to be taken by Each Government

No.	Items	To be covered by Grant Aid	To be covered by Recipient Side
1	To secure land		•
2	To clear level and reclaim the site when needed		•
3	To construct gates and fences in and around the site		•
4	To construct the parking lot	(•)	•
5	To construct roads		
	1) Within the site	•	
	2) Outside the site		•
6	To construct the building	•	
7	To provide facilities for the distribution of electricity , water supply , drainage and other incidental facilities		
	1) Electricity		
	a) The distributing line to the site		•
	b) The drop wiring and internal wiring within the site	•	
	c) The main circuit breaker and transformer	•	
	2) Water Supply		
	a) The water distribution main to the site		•
	b) The supply system within the site (receiving and elevated tanks)	•	
	3) Drainage		
	a) The drainage main(for storm sewer and others to the site)		•
	b) The drainage system (for toilet sewer, ordinary waste, storm drainage and others) within the site	•	
	4) Gas Supply		
	a) The gas main to the site		•
	b) The gas supply system within the site	•	
	5) Telephone System		
	a) The telephone trunk line to the main distribution frame/panel (MDF) of the building		•
	b) The MDF and the extension after the frame/panel	•	
	6) Furniture and Equipment		
	a) General furniture		•
	b) Project equipment	•	
8	To bear the following commissions to the Japanese foreign exchange banking services based upon the B/A		
	1) Advising commission of A/P		•
	2) Payment commission		•
9	To ensure unloading and customs clearance at port of disembarkation in recipient country		
	1) Marine (Air) transportation of the products from Japan to the recipient country	•	
	2) Tax exemption and custom clearance of the products at the port of disembarkation		•
	3) Internal transportation from the port of disembarkation to the project site	(•)	•
10	To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contract such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of the their work		•
11	To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the supply of the products and services under the verified contracts		•
12	To maintain and use properly and effectively the facilities contracted and equipment		•

	provided under the Grant		
13	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 installation of the equipment		•

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[Appendices-II]

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(2) Resource evaluation regarding present catch levels by Fisheries Division	A II -2
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5. Other Relevant Data

(1) Marine product demand on Antigua and Barbuda

According to FAO statistics, per capita marine product consumption on Antigua was an average 46.0 kg/person/year for the period 1990~1992. In 1995~1997, however, this average increased to 51.8 kg/person/year and hovered at this amount during 2003~2005 (see Attached Table 4).

Imported marine products account for up to 35% of domestic marine product demand. In fiscal 2005, imported salt-dried and smoke-cured fish totaled 536 tons, accounting for 34.5% of the total 1,553 tons of imported marine products (see Attached Table 5). This type of fish is a traditional food in Christian households that make up 93% of the population, and is consumed every Sunday for breakfast. Therefore, import quantities are not expected to decrease until alternative domestically processed products of the same type become available locally. (In this regard, the Department of Fisheries has experimentally developed an alternative salt-cured shark product, the quality of which has been favorably received).

Quantity of imported fresh, refrigerated and frozen fish is 461 tons, equivalent to 29.7% of total marine product imports. Depending on price, it would be possible to replace imported fish with domestically harvested fresh fish. In recent years, however, imports of inexpensive frozen fish from Guyana have increased at an average import price of US\$2.49/kg (EC\$3.05/pound), which is considerably less than the EC\$6.0/pound price for the cheapest reef fish from Barbuda. Accordingly from a strictly pricing standpoint, it is difficult for fresh fish from Barbuda to compete with imported fish. Nevertheless, the population of Antigua still exhibits a strong preference for fresh fish, and there remains a potential market for domestic fresh fish even if it is more expensive than imported fish. Test marketing by trial and error in this regard will be necessary.

In terms of marine product exports, on the other hand, the export of live lobster has been stable since 2000 within the 50~60 ton range. Fresh fish exports from the country have increased from 3 tons in 2000 to 52 tons in 2006. This is due to the fact that during the grace period (until 2009) for measures to address HACCP as stipulated by the EU, tacit approval has been given to product export under the previous procedure of simply possessing a customs certificate of export.

With regard to products for export, the Point Wharf fishery center is currently the only facility capable of fresh fish processing (descaling, degilling, gutting, etc.) in line with HACCP. From 2009, the Department of Fisheries will be compelled to have all fish for export undergo sanitary inspection and appropriate processing at the center (for export, a health certificate issued by the Department of Fisheries is necessary).

Other existing distribution facilities on Antigua (Antigua Fisheries Limited (a government statutory corporation), and the fishery complexes at Parham and Urlings) are currently not capable of sanitary ice production nor activities strictly in line with sanitation standard operating procedures (SSOP). If measures to address HACCP as stipulated by the EU are not in place by the end of the grace period in 2009, it is possible that fresh fish harvested at Antigua will no longer be able to qualify for export. Under such circumstances, the Department of Fisheries has concluded that the envisioned Project facilities will enable sanitary fresh fish (the freshness of which has been controlled from the catching stage applying sanitary ice produced at the Project complex, and which meets standards for receiving at the processing facility of the Point Wharf fishery center) to be shipped from Barbuda to Antigua.

(2) Resource evaluation regarding present catch levels by Fisheries Division

The following points of special note from a fisheries development perspective are summarized below based on the Department of Fisheries comparison of current catches in Antigua and Barbuda for each fish species group as set out in the above fisheries development plan (draft) with the maximum sustainable yields (MSY) for the same species groups as assessed for the immediate region.

Table Department of Fisheries resource evaluation regarding present catch levels (for the period 2001~2004)

Fish species group	Evaluation
Shallow sea reef fish	Catch quantity (1000~1500 tons) is assumed to be either on a par with or slightly below the MSY level (1570~1780 tons).
Snapper	Catch quantity (284~411 tons) is below the MSY level (680 tons).
Deep sea-slope snapper / grouper	Current catch quantity (125~202 tons) is estimated at around 25% of overall potential catch for this group. However, due to a wide variance in estimated MSY value (55~588 tons), it cannot be assessed as to whether or not catch quantity has reached the MSY level. Careful attention to this issue is necessary in light of the fact that this species group is particularly sensitive to fishing pressure.
Coastal pelagic fish	In the past, this group of fish were harvested by means of net casting, shore seining, and drive-in net fishing. In recent years, however, fishermen no longer target this species group, and catch data is therefore not available.
Large pelagic fish	15~30 tons of this type of fish are caught annually by recreational fishing. According to resources evaluation by ICCAT, large pelagic fish are generally excessively harvested. Nevertheless, some species such as yellowfin tuna, etc. are caught in a quantity that has not reached the MSY level (76~504 tons). In the future, Antigua and Barbuda will accordingly join ICCAT to be assigned quotas for resource exploitation.
Lobster	Catch levels (243~276 tons) in some cases exceed the estimated MSY value (178~1918) depending on the specific variety of lobster. In most instances, however, catch quantities are well below the MSY level and it is accordingly concluded that the present harvesting pattern is sustainable. Oversight is nevertheless necessary in light of the fact that a high percentage of lobsters caught have not yet reached maturity.
Conch	These are mainly harvested around Antigua. Conch harvesting is still underdeveloped in the case of Barbuda. Harvested level (35~74 tons) is roughly 30% of the MSY (214~306 tons). Nevertheless, careful oversight will be necessary if harvesting operations are further expanded in the future.
Shark, ray, etc.	Catch level (8~36 tons) has not reached the MSY (70 tons). Expansion of fishing operations for this species group is possible. Nevertheless, oversight will be necessary. Experimental locally salt-cured products have been favorably evaluated as a potential alternative to imported salt-cured products.

(3) Time consumed in fishing embarkation preparations at mooring locations and in landing catches; and frequency of fishing boat repair

Times consumed in preparation for fishing embarkation, and in fish landing at the Project site are indicated in the following table.

Table Times consumed in preparation for fishing embarkation, and in fish landing

Boat length (ft, Hp)	Codrington			
	Preparation (min./operation)		Fish landing (min./operation)	
	Case of using existing wharf for sightseeing boat	Case of Off-shore anchored	Case of using existing wharf for sightseeing boat	Case of Off-shore anchored
13 (25)	10, 10 (2boats)	5,	5, 5.5 (2boats)	10,
13 (40)		5, 5,		10
16 (25)		10		15
22 (40)	5.5	5, 5, (2boats)	5	10, 10, (2boats)
23 (40)		15		25
25 (40)		5, 10 (2boats)		10, 30 (2boats)
25 (48)	4.5		10	
25 (60)		10		30
25 (85)	5.5		10~ 15	
25 (115)		12.5		30
25 (170)		15		22.5
29 (65 x 2)		12.5		20
40 (355) inboard	7		20	

Source: Barbuda fisheries baseline survey, 2009, JICA Preparatory Survey Team

In the case of fishermen who moor their boats at the beach, time for fishing preparation as well as time for catch landing require generally 5~10 minutes longer than in the case of fishermen who moor at the wharf. For example, if fishermen have to wade through water to reach their anchored boats: (i) the average time consumed per boat in preparation for fishing embarkation is 2.2 minutes longer, and (ii) the average time consumed for catch landing is 9 minutes longer (see following table), than in the case of fishermen who moor at the wharf.

Table Comparison of times for fishing preparation and catch landing at the existing Codrington mooring wharf and nearby beach

	Total time consumed (minutes)	Number of accessing boats	Average time consumed (min/boat)
1) Preparation for fishing operations			
• In case where wharf is used	42.5	6	7.0
• In case where fishermen wade to their boats	110.5	12	9.2
• Difference in time consumed	—	—	+2.2
2) Catch landing operations			
• In case where wharf is used	58	6	9.7
• In case where fishermen wade to their boats	225	12	18.7
• Difference in time consumed	—	—	9.0

(4) Outline of activities by the Fisheries Division

In the case where a distribution structure for marketing of fresh fish catches to Antigua is established as a result of the envisioned Project facilities, it is concluded that fishermen will both increase the frequency of fishing operations as well as diversify their fishing methods to expand the content of the marine products they harvest. In conjunction with invigorating local fishing activities, the Department of Fisheries plans to implement various fishermen training programs regarding appropriate resource management that enables a balanced exploitation as well as preservation of the lagoon ecosystem.

The Fisheries Division established a new fishery complex section within the Division in fiscal 2008. The new section aims at integrated management of all fishery complexes in the country, and will work to establish an operation and maintenance structure for the Project facilities that matches the content and level of that for other already existing complexes. Components of activities be carried out by the Fisheries Division are as follows:

- Developing and managing the fishery sector including preparation for national planning (fishermen consultation)
- Revising fishery regulations in line with current circumstances within the fishery industry (training sessions annually)
- Developing and managing catch landing infrastructure (staff training)
- Developing hurricane shelters
- Permits and authorizations (training sessions)
- Implementing coastal bio-diversity programs
 - Establishing ocean preserves
 - Setting up sea turtle monitoring programs
 - Cataloging and monitoring biological species inhabiting ocean and coastal waters
 - Monitoring water quality
 - Monitoring marine beaches
- Fishermen training and extension activities (training sessions annually)
 - Fishermen training in boat handling techniques, engine repair, and exploitation of as yet untapped fish resources (species)
 - Creating added-value products
 - Appropriate handling of marine products
- Collecting statistical data:
 - Data collection training (staff training sessions)
 - Collecting and analyzing data
 - Surveying fish populations (by species)

Staffs of the Fisheries Division are dispatched for researches or instruction purposes to Barbuda more or less 30 times annually, and are forced to be in an inconvenient circumstances staying in local private residences because of lack of accommodation except high class resort hotels on Barbuda. Such travel expenses are covered under the Fisheries Division budget, dispatching an instructor to

Barbuda costs EC\$306 (US\$135) per day including the cost of overnight lodging. This places a considerable strain on the department's budget.

The fisheries Division strongly requests to provide a sleeping corner within the envisioned administration building. It is judged such a sleeping corner is to be provided taking above mentioned situation of the staffs into consideration

Staff dispatch performance in fiscal 2008 is as indicated in the table below.

Table Staff dispatch performance to Barbuda in fiscal 2008

Month	Name	Purpose	Duration
Jan.	Hilroy Simon	Survey	4 nights
Jan.	Philmore James, Hirloy Simon, Mark Archibald	Beach monitoring exercise	3 nights
Jan	Tricia Lovell	Codrington lagoon management meeting	1 night
Feb.	Tricia Lovell	-ditto-	1 night
Feb.	Cheryl Appleton	Meeting with fishermen	2 night
Mar.	Tricia Lovell	Codrington lagoon management meeting	1 night
Mar.	George Looby	Extension works	2 nights
Apr.	Tricia Lovell	Codrington lagoon management meeting	1 night
May	Tricia Lovell	-ditto-	1 night
May	Philmore James, Hirloy Simon, Mark Archibald	Beach monitoring exercise	3 nights
Jun.	Tricia Lovell	Codrington lagoon management meeting	1 night
Jul.	Tricia Lovell	-ditto-	1 night
Jul.	Cheryl Appleton	Meeting with Council, signing fishermen ID	2 night
Aug.	Tricia Lovell	Environmental works	2 nights
Aug.	George Looby	Extension works	2nights
Aug.	Tricia Lovell	Codrington lagoon management meeting	1 night
Aug.	Hirloy Simon	Statistical survey	6 nights
Sep.	Philmore James, Hirloy Simon, Mark Archibald	Beach monitoring exercise	3 nights
Sep.	Tricia Lovell	Codrington lagoon management meeting	1 night
Sep.	Cheryl Appleton	Meeting with fishermen	2 night
Oct.	Cheryl Appleton	Meeting with Council, signing fishermen ID	2 night
Oct..	Tricia Lovell	Codrington lagoon management meeting	1 night
Nov.	Tricia Lovell	-ditto-	1 night
Nov.	Hilroy Simon	Survey	3 nights
Dec.	Tricia Lovell	Codrington lagoon management meeting	1 night
Dec.	Philmore James, Hirloy Simon, Mark Archibald	Beach monitoring exercise	3 nights

(5) Fish price in Barbuda and Antigua obtained by Barbuda fishermen

In order to identify the fresh fish selling price by fishermen on Barbuda, fishermen were interviewed under the baseline survey. Four interview survey responses regarding fresh fish selling prices on Antigua were also obtained. The summary is shown in the table below (for detail, see attached table 7).

Table Fish price comparison between both islands

Fish Type	Barbuda		Antigua	
	Tourist season	Off season	Tourist season	Off season
	Fish Price (EC\$/lb)	Fish Price (EC\$/lb)	Fish Price (EC\$/lb)	Fish Price (EC\$/lb)
Lobster	14.1	12.3	18	17
Sea breams	9.9	9.8	13.8	13.8
Groupers	9.6	9.7	13	13
Reef fishes	7.9	7.9	9.5	9.5
Migratory fishes	9.9	9.8	14	14

Remarks: Fish prices are the weighted averages.

Source: Barbuda fisheries baseline survey, 2009, JICA Preparatory Survey Team

Followings are the characteristics of fish prices between both islands:

- Only the price of lobster shows conspicuous seasonal fluctuation. Especially on Barbuda, the price rises about 15% higher in the tourist season.
- Generally, the fish prices in Antigua are higher than in Barbuda. The price of the cheapest reef fish, lobster, sea breams/groupers/migratory fishes in Antigua is higher in 20%, 27%, about 40%, respectively.
- The price of reef fish is about EC\$8/lb that is cheapest in Barbuda. The price of sea breams/groupers is EC\$9/lb that is about 20% higher than the price of reef fish. Even in Antigua, the price of reef fish is cheapest among fishes. However, its price is about EC\$9.5 that is equivalent to the same price level of sea breams/groupers in Barbuda. Further, the price of sea breams/groupers is about 40% higher than that of reef fish in Antigua.
- Sea breams/groupers are the objective fish for export, and are presently being exported from Antigua. The fish type that has the biggest price gap between both islands is the group of sea breams/groupers. Further, this group occupies about 30% out of total catch of fishes. Accordingly, sea breams/groupers is desirable for marketing from Barbuda to Antigua. The price gap of migratory fishes is also large, but their catch is presently very limited in this country (for detail, see attached Table 6).

(6) Civil design references A, B, C and D

1) Excerpted civil design reference A: Guideline for setting wharfs water depth and berth length

2.5 Design water depth and berth length

[Basic approach]

Wharf design water depth and berth length is to be determined for stable and efficient wharf use, with consideration to the type of fishing boat to access the facility.

[Description]

Design water depth is determined based on the draft for the largest boat berthing at the wharf plus an appropriate water depth margin value. Adopted design depth value is rounded up to the nearest 0.5 m unit:

Wharf design water depth = [draft for largest boat] + [depth margin]

With regard to fishing boat draft, value for fully loaded displacement is adopted in the case of a catch landing and fishing preparation wharf, while the value for unloaded displacement is adopted in the case of a wharf for idle mooring. However, in the case where boat dimensions are either unknown or it is difficult to accurately calculate draft, it is acceptable to determine draft values in accordance with criteria set out in Volume 2, Section 13 (Fishing Boat Salient Features).

Berthing length is determined on the basis of boat length (in the case of sideways berthing), or boat beam (in the case of longways berthing), plus an appropriate margin value:

Berth length = [ship length] + [length margin] (in the case of sideways berthing)
 = [ship beam] + [beam margin] (in the case of longways berthing)

[Points of special note]

Water depth margin is ultimately determined with appropriate consideration to the degree of water stillness within the harbor area. Nevertheless, the following values are commonly adopted. In the case of significantly intense wave activity, it is necessary to further increase the values set out below:

- (i) Seabed is hard: over 0.5 m
- (ii) Seabed is soft: 0.5 m

Length margin and beam margin are appropriately determined with consideration to status of wharf use, method of boat handling, etc. Nevertheless, the following are accepted standard values:

- (i) Length margin: 0.15L (L=boat length)
- (ii) Beam margin: 0.5B (B= boat beam)

Source: Port and Harbor Design Handbook (2003 edition), Japan Port and Harbor Association (edited by Fisheries Agency)

2) Excerpted civil design material B: Guideline for setting apron width

(i) Apron width

In the case where apron width cannot be precisely determined based solely on criteria of intended use, etc., it is acceptable to adopt the values indicated in Table 6-2-6

Table 6-2-6 Apron width

Category		Apron width
On-land	Entire catch transport to storage area	3.0
	Direct transport by vehicle from apron	10.0
Fishing departure preparation		10.0
Idle anchorage		6.0

Source: Port and Harbor Design Handbook (2003 edition), Japan Port and Harbor Association (edited by Fisheries Agency)

3) Excerpted civil design material C: Standard crest height by fishing boat tonnage and by tidal level

2.6 Crest height

[Basic approach]

Wharf crest height is appropriately determined with consideration to tidal levels and nature of facility use.

[Description]

- (i) In the case of a harbor water area where there is a major difference in tidal levels, a compound cross-sectional structure is adopted where a portion of the apron is lower to improve convenience of use by small fishing boats.
- (ii) Crest height is to be determined such that sea water does not excessively overtop the structure and flood the hinterland behind the wharf. This should take into thorough consideration the frequency of high wave activity within the harbor, abnormal tidal levels, the effect of river water level in the case of a structure at a river estuary, as well as the possibility of ground subsidence, etc.

[Points of special note]

In cases where the type and dimensions of fishing boats to access the design facility cannot be readily specified, it is acceptable to apply as the design crest height the mean monthly highest water level (H.W.L.) to which has been added the corresponding value set out in Table 6-2-5. In the case of a wharf for idle mooring, the corresponding supplemental value as also indicated in Table 6-2-5 is to be further added in determining crest height.

(i) Crest height for catch landing and fishing preparation wharf =

[H.W.L.] + [corresponding value in Table 6-2-5]

(ii) Crest height for idle mooring wharf =

[H.W.L.] + [corresponding value in Table 6-2-5] + [supplemental value for idle mooring also as indicated in Table 6-2-5]

Table 6-2-5 Crest height computational values

Tidal level differential (H.W.L. - L.W.L.)	Targeted fishing boats (G.T.)			
	0~20 tons	20~150 tons	150~500 tons	Over 500 tons
0 m ~1.0m	0.7m	1.0m	1.3m	1.5m
1.0 ~ 1.5	0.7	1.0	1.2	1.4
1.5 ~ 2.0	0.6	0.9	1.1	1.3
2.0 ~ 2.4	0.6	0.8	1.0	1.2
2.4 ~ 2.8	0.5	0.7	0.9	1.1
2.8 ~ 3.0	0.4	0.6	0.8	1.0
3.0 ~ 3.2	0.3	0.5	0.7	0.9
3.2 ~ 3.4	0.2	0.4	0.6	0.8
3.4 ~ 3.6	0.2	0.3	0.5	0.7
over 3.6	0.2	0.2	0.4	0.6
Supplemental value in the case of idle mooring	0m	0~0.5m	0.5~1.0m	1.0m

Source: Port and Harbor Design Handbook (2003 edition), Japan Port and Harbor Association (edited by Fisheries Agency)

4) Excerpted civil design material D: Ramp gradient

8.3 Ramp and boat yard design

[Basic approach]

A stable design is to be adopted for ramp and boat yard, taking into consideration wave conditions, conditions of use, etc.

[Description]

- (i) Standard ramp crest height is $H.W.L. + 2H$ (H is the wave height at the front of the ramp).
From the standpoint of convenience of use, it is necessary to give attention to the relationship between the ramp crest height and the height of the adjacent mooring wharf. Nevertheless, in the case of a location where wave height in the water area to the front of the ramp is great, it is necessary to determine crest height with consideration to wave run-up.
- (ii) Ramp gradient is determined so as to enable the efficient raising and lowering of boats with consideration to type of fishing boat, tidal levels, and nature of ramp use. Gradient generally is in the range 1:6 ~ 1:10. It is recommended that gradient be uniform for the entire ramp.
- (iii) Ramp foundation and paving works are to be designed so as to provide a structure stable against external forces including boat bumping, wave activity, etc.
- (iv) With regard to ramp paving works, it is necessary to pay particularly close attention to the ramp surface subject to wave run-up, as there is the danger that underlying foundation material may be sucked out through joint cracks in the pavement thereby raising the possibility of subsidence.

Source: Port and Harbor Design Handbook (2003 edition), Japan Port and Harbor Association (edited by Fisheries Agency)

(7) Details of operation and maintenance cost

(a) Breakdown of personnel cost

Assignment	Annual salary (EC\$/year)	No. of staff	Total (EC\$/year)
1) Facility director	42,400	1	$42,400 \times 1 = 42,400$
2) Facility director assistant/accountant	32,500	1	$32,500 \times 1 = 32,500$
3) Office staff	18,950	1	$18,950 \times 1 = 18,950$
4) Caretaker staff	18,950	1	$18,950 \times 1 = 18,950$
5) Janitorial staff	16,500	1	$16,500 \times 1 = 16,500$
6) Technical staff	30,000	3	$30,000 \times 3 = 90,000$
7) Workers (to be newly recruited)	15,600	2	$15,600 \times 2 = 31,200$
Total (EC\$/year)			250,500

(b) Breakdown of power cost

Item	Type	Capacity (kW)	Rate	Actual operation (hours/day)	Power consumption (kW/day)	Days of operation (per year)	kW/yr
Water supply (weekdays)	Motor	8	0.83	3	29	312	9,048
Water supply (holidays: for ice production only)	Motor	8	0.83	1	10	52	520
Wastewater treatment facility (bilge)	Motor	8	0.83	1	10	365	3,650
Blower for above facility	Motor	1	0.83	24	29	365	10,585
Ice production	Motor	12	0.83	12	173	365	63,145
Ice storage room	Motor	11	0.83	3	40	365	14,600
Cold storage room	Motor	6	0.83	3	22	365	8,030
Office electrical outlets, etc.	Lighting	10	1	8	80	312	24,960
Sanitary control area	Lighting	20	1	3	60	312	18,720
Night illumination	Lighting	10	1	8	80	365	29,200
Total							182,458

Source: Personnel unit costs as taken from the Antigua and Barbuda 2009 budget document.

Note: Days of operation: 6 days (per week, Monday through Saturday) \times 52 weeks/year = 312 days/year.

However, it is assumed that the ice making, ice storage, cold storage and cleaning tank facilities will be operated every day all year round.

Annual electricity fees are: $182,458 \times \text{EC}\$0.6 \text{ kW/h} = \text{EC}\$109,474$

(c) Breakdown of cost for purification tank maintenance service

Cost for purification tank maintenance service comprises the annual contract amount for a maintenance engineer.

Engineer remuneration and chemical cost per year:	EC\$ 1,200	
Engineer travel cost per month (boat travel: EC\$220 × 12 times/mo.)		EC\$ 2,640
<u>Sludge removal</u>		<u>EC\$ 800</u>
Total		EC\$ 4,640

Note: The above are calculated based on performance at the Point Wharf fishery center.

(d) Breakdown of water treatment cost

Cost for water treatment comprises the cost for disinfectant chlorine and filters.

(i) Calculation of daily water quantity to be treated

The quantity of water to be for disinfectant chlorine and filters is estimated at 1.1 tons/day. This comprises the total in the table below minus the quantity of shower water.

Table Breakdown of wastewater quantities (maximum estimate)

Facility	Content	Quantity of wastewater per day
Work area	Floor space : 74.8m ² ×10L Insulated fish : boxes : 5 boxes × 20L Fish tray : 65 × 20L Fish washing : 65L	1.0 tons
Toilet/shower	Shower (18 persons) : 900L Toilet (16 persons) : 400L Other wash facilities : 100 L	1.4 tons
Office water supply, etc.	100L	0.1 tons
Total		2.5 tons

Source: Taken from Item 2) under Section 3.2.2.4 of the main text.

In addition, source water for ice making that requires chlorinating disinfectant treatment is 1.5 times the quantity of ice produced. Accordingly, this is equivalent to:

$$0.435 \text{ (tons/day)} \times 1.5 = 0.65 \text{ tons/day}$$

Accordingly, the daily quantity of water requiring treatment is calculated at:

$$1.1 + 0.65 = 1.75 \text{ (tons/day)}$$

On this basis, the annual total for water requiring treatment is calculated at: 1.75 (tons/day) × 312 (days/year) = 546.0 (tons/year)

(ii) Required chlorine quantity

WHO guidelines stipulate the acceptable ceiling for chlorine concentration at 5.0 mg/L. In the case of Japanese standards for city water, a concentration of at least 0.1 mg/L is stipulated for tap water (this level to ensure disinfectant effect).

On this basis, assuming a necessary chlorine concentration of 2 mg/L, required chlorine quantity

is calculated at:

$$546,000 \text{ L} \times 2 \text{ mg/L} = 1,092,000 \text{ mg} = 10,920 \text{ g} \doteq 10.92 \text{ kg}$$

Accordingly, a mix including 6% sodium hypochlorite in a total 20 kg volume (chlorine content at 1.2 kg), packaged in ten 20 kg sacks will be necessary per year.

(iii) Filters

A combination of two units each of medium mesh and fine mesh filters will be required for replacement every 3 months (i.e. four times per year).

On the basis of i), ii) and iii) above, facility water treatment cost is calculated as follows:

Chlorine: 6% sodium hypochlorite in ten 20 kg sacks:

$$10 \text{ sacks} \times \text{EC\$}200/\text{sack} = \text{EC\$}2,000$$

Filters (1 set / 4 times / year): 4 sets \times EC\$800/set = EC\$3,200

Total

EC\$ 5,200

(e) Cost for equipment replacement

Replacement item	Utility life (years)	Equipment cost (yen)	Annual reserve fund (yen/year)
Ice making plant	13	3,900,000	300,000
Cold storage facility	13	4,030,000	310,000
Emergency generator	15	2,000,000	130,000
Radio	10	250,000	25,000
Crane	7	150,000	21,000
Weighing scale	5	100,000	20,000
Total	—	—	80,600

(8) Marine and terrestrial biological survey

The Project site is faces to Codrington lagoon that is designated as a national park and is a wetland registered to the Ramsar Convention. Marine and terrestrial biological survey was conducted in order to grasp the baseline conditions of the site and its around prior to the project implementation. Names of observed organisms were listed together with the DAFOR indicator, by the belt transect method for marine survey and the quadrat method for the terrestrial survey, respectively. The survey was entrusted to a marine biologist residing in Barbuda. The result is shown in the table below.

<Marine organisms>

Common Name	Scientific Name	DAFOR*
FISH		8 Species
Flagfin Mojarra	<i>Eucinostomus melanopterus</i>	F
Yellowfin Mojarra	<i>Gerres cinereus</i>	F
Bluestripe Grunt	<i>Haemulon sciurus</i>	O
Gray Snapper	<i>Lutjanus griseus</i>	F
Schoolmaster snapper	<i>Lutjanus apodus</i>	O
Great Barracuda	<i>Sphyræna barracuda</i>	O
Doctorfish	<i>Acanthurus chirurgus</i>	R
Sprat	Not identified	O
SEAGRASS		2 Species
Turtle grass	<i>Thalassia testudinum</i>	D
Manatee grass	<i>Syringodium filiforme</i>	D
CRUSTACEANS		3 Species
Spiny Lobster	<i>Panulirus argus</i>	O
Blue Crab	<i>Callinectes sapidus</i>	O
Shrimp	<i>Penaeus sp.</i>	O
CNIDARIANS		
Upsidedown Jellyfish	<i>Cassiopea xamachana</i>	F
Turtle Grass Anemone	<i>Viatrix globulifera</i>	R
Banded Anemone	Not identified: order <i>Actinaria</i>	F
Feather Duster Worms		2 species
Banded	Not identified: family <i>Serpulidae</i>	A
Small calcareous	Not identified: family <i>Serpulidae</i>	F
TUNICATES		1 species
Flat tunicate	<i>Botryllus planus</i>	O
SPONGES		7 species
Chicken Liver sponge	<i>Chondrilla nucula</i>	O
Heavenly sponge	<i>Dysidea etherea</i>	O
Loggerhead sponge	<i>Spheciospongia vesparium</i>	O
Stinker sponge	<i>Ircinia sp</i>	F
Black sponge	Not identified: family <i>spongiidae</i>	F

Common Name	Scientific Name	DAFOR*
Black-Ball sponge	Not identified: class <i>Demospongiae</i>	O
Grey-Ball sponge	Not identified	O
Scleractinian (stony) corals		2 species
Starlet coral	<i>Siderastrea radians</i>	R
Rose coral	<i>Maniciana areolata</i>	R
MOLLUSKS		10 species
Atlantic Modulus	<i>Modulus modulus</i>	A
Common Dove Snail	<i>Columbella mercatoria</i>	O
False Cerith	<i>Batillaria minima</i>	A
Dwarf Olive	<i>Olivella sp.</i>	R
Striated Bulla	<i>Bulla striata</i>	R
Apple Murex	<i>Murex pomum</i>	O
Keyhole Limpet	<i>Diodora cayenensis</i>	R
Atlantic Pearl oyster	<i>Pinctada radiata</i>	O
Stocky Cerith	<i>Cerithium litteratum</i>	A
Cantharus	<i>Cantharus sp.</i>	O
GREEN ALGAE		12 Species
Mermaid's Wineglass	<i>Acetabularia calyculus</i>	A
Sea Lettuce	<i>Ulva lactuca</i>	O
Green moss	<i>Chaetomorpha linum</i>	F
Green moss	<i>Chaetomorpha crassa</i>	F
Caulerpa	<i>Caulerpa prolifera</i>	O
Caulerpa	<i>Caulerpa verticillata</i>	O
Caulerpa	<i>Caulerpa sertularioides</i>	O
Cat tail algae	<i>Bathophora oerstedii</i>	D
Mermaid's Shaving Brush	<i>Penicillus capitatus</i>	O
Halimeda	<i>Halimeda incrassata</i>	F
Halimeda	<i>Halimeda monile</i>	F
Mermaid's fan	<i>Udotea flabellum</i>	O
BROWN ALGAE		1 species
Dictyota	<i>Dictyota linearis</i>	
RED ALGAE		4 species
Acanthophora	<i>Acanthophora spicifera</i>	R
Laurencia	<i>Laurencia poitei</i>	O
Digenia	<i>Digenia simplex</i>	O
Red alga	<i>Ceramium nitens</i>	O

*DAFOR is a subjective rating which provides an indication of whether an organism is Dominant, Abundant, Frequent, Occasional or Rare in a particular ecosystem

<Terrestrial organisms>

Common Name	Scientific Name	Location
Red Mangrove	<i>Rhizophora mangle</i>	Fringing shoreline
White Mangrove	<i>Laguncularia racemosa</i>	Tidal areas and mudflats
Black Mangrove	<i>Avicennia nitida</i>	Tidal areas and mudflats
Buttonwood	<i>Conocarpus erectus</i>	Occasionally wet areas
Poison Mangrove	<i>Bontia daphnoides</i>	Dry land
Cattle Tongue		Dry land
Marsh fleabane	<i>Pluchea odorata</i>	Dry land
Sea Purslane	<i>Sesuvium portulacastrum</i>	Dry land
Salt grass	<i>Sporobolus virginicus</i>	Dry land and tidal areas
Spike Rush	<i>Fimbristylis cymosa</i>	Dry land and tidal areas
Coastal sedge	<i>Cyperus planifolius</i>	Dry land and tidal areas
Seaside Heliotrope	<i>Heliotropium curassavicum</i>	Dry land and tidal areas

(9) Scoping Matrix on Environmental and Social Consideration (incl. possible evasive action/ mitigation measures)

Rating:

A: Serious impact is expected; B: Some impact is expected; C: Extent of impact is unknown; No mark: No impact is expected; +: Positive impact is expected.

No.	Impact	Current Status	Rating		Outline (Issues Concerned)	Possible Evasive Action/ Mitigation Measures
			During construction	After construction		
Social Environment						
1	Involuntary Resettlement	Project site is not a residential area.			There will be no involuntary resettlement.	
2	Local Economy such as employment and livelihood, etc.		+	+	The Project may generate employment for construction and possibly O&M of a new Complex.	
3	Land use and utilization of local resources	There are 23 vessels mooring in and around the Project site. A large portion of the Project site is a vacant lot. However, some portion overlaps with land of an existing facility (therefore the fence needs to be set back). Some fishers collect fish bates in and around the Project site. There will be restriction on shipping sand and stones from 2009. However, said restriction does not apply when it is used for development activities within the Island. Majority of fishers is engaged in marine fisheries targeting lobsters. Yet, there are some who fish within lagoon.	B		Vessels moored at the Project site need to be moved during construction. Barbuda Council, an authority for development activities within the Island, authorised and issued permission for the land usage of the proposed Project site. Fish bates will not be collected in and around the Project site during construction. Barbuda Council authorised and issued permission for the usage of sand and stones for construction of the Complex.	<ul style="list-style-type: none"> • Consensus will be made with fishers before construction starts. • An alternative mooring site will be identified. • A construction supervisor shall re-examine borders of the Project site with Barbuda Council before construction. • Consensus will be made with fishers before construction starts. • A construction supervisor shall examine its usage status with Barbuda Council during construction period. • Fisheries Division shall advise on prevention measures for overfishing within lagoon and monitor resource conditions (e.g. change in body lengths of major fish species)

No.	Impact	Current Status	Rating		Outline (Issues Concerned)	Possible Evasive Action/ Mitigation Measures
			During construction	After construction		
4	Social institutions such as social infrastructure and local decision-making institutions	As it is explained in the main document, Barbuda Council has the authority to decide on development activities within the Island.	C	C	There may be a discrepancy in understanding towards the proposed fisheries development plan between the Fisheries Division and Barbuda Council.	<ul style="list-style-type: none"> Information will be actively shared between Fisheries Division and Barbuda Council.
5	Existing social infrastructures and services	There is a power cable of 11,000 voltages adjacent to the Project site. The power is then dropped to a single phase of 240 voltages by a pole mounted transformer to be supplied to the site. Irregular short blackout is frequently caused by APUA. APUA provides city water from groundwater to 95% of households in Barbuda Island. Yet, the amount is limited to 50L/person/day. Each household has a rain water harvesting tank and uses rain water together with city water.	B	C	Excessive power usage is concerned during construction.	<ul style="list-style-type: none"> During construction period, a construction supervisor shall check power usage status regularly. If there is necessity, he/she will discuss with APUA. A back-up generator will be introduced for blackouts during O&M of the Complex.
6	Poor, indigenous and ethnic minorities	The population of Barbuda Island is 1,325 (National Census, 2001) and majority is African descendants. There is neither poor, indigenous nor ethnic minorities whom to be specifically noted.			Intensive water usage during and after construction may decrease the amount of city water to be provided to households.	<ul style="list-style-type: none"> When intensive water usage is required at a certain stage of construction, both city and rain water need to be stored well in advance. Rain water shall also be actively used even after construction. Monitoring of water usage will be conducted by a construction supervisor during construction and a Complex manager after construction in coordination with APUA.
7	Misdistribution of benefit and damage	Fishery is one of the major industries in Barbuda Island. One third of its population is engaged in fisheries.		+	The Project has no impact on poor, indigenous and ethnic minorities.	-
8	Cultural heritage	There is no cultural heritage in and around the Project site.			The Project has no negative impact. Once a fresh fish distribution system to Antigua is established, fisheries can further be enhanced and activation of local economy is anticipated.	-
					The Project has no impact on cultural heritage.	-

No.	Impact	Current Status	Rating		Outline (Issues Concerned)	Possible Evasive Action/ Mitigation Measures
			During construction	After construction		
9	Local conflict of interests	Currently, there are three lobster traders in Barbuda Island who directly trade lobsters with fishers.	C	C	Activation of overall local economy is anticipated through the implementation of the Project. However, lobster traders are worried that they may not have strong impacts on fishers as they currently do.	<ul style="list-style-type: none"> Barbuda Council shall facilitate a meeting among stakeholders to optimise and evenly distribute benefit of having a Complex.
		The Project site is adjacent to an existing jetty for tourism.			There are some who worries negative impacts on tourism.	
10	Water Usage or Water Rights and Rights of Common	There is no water usage or water rights and rights of common in and around the Project site.			The Project has no impact on water usage or water rights and rights of common.	-
11	Sanitation	Currently, a public garbage collection vehicle collects solid wastes from each household once a week. Some rubbish is found in and around the Project site.	B	B	There will be some wastes to be produced during and after construction.	<ul style="list-style-type: none"> The garbage bin with a lid will be introduced within the Complex in coordination with existing garbage collection system. A worker in charge of waste management shall be posted.
12	Hazards (Risk) Infectious diseases such as HIV/AIDS	There is no data on number of people infected or died of HIV/AIDS on Barbuda Island. Antigua & Barbuda as whole, 4% of death cause is due to infectious diseases and parasites. Of which, 0.07% is caused by STD excluding HIV/AIDS while 1.72% is caused by HIV/AIDS. Looking into areal statistical data in world wide, the rate of population infected by HIV/AIDS is 1.2% (2006) in Caribbean Islands which comes to the second after 5.6% of Sub-Sahara Africa (CAREC, 2007).	B		There may be a risk that workers from outside of the Island spreading infections diseases.	<ul style="list-style-type: none"> Workers can be enlightened on HIV/AIDS through activities currently conducted by 'Antiguan AIDS Secretariat' and 'Health hope & HIV foundation' (i.e. posters, pamphlets and workshops).

No.	Impact	Current Status	Rating		Outline (Issues Concerned)	Possible Evasive Action/ Mitigation Measures
			During construction	After construction		
Natural Environment						
13	Topography and Geographical features	<ul style="list-style-type: none"> The foundation of the Project site is low and flat. In the past, waves reached to the higher side of the site. The foundation is soft along the shoreline. Refer to 2-2-2 Natural Conditions in the main document for further details. 			<p>The sea water level possibly rises by 2m during hurricanes.</p> <p>The soft layer of a foundation has to be replaced.</p>	<ul style="list-style-type: none"> The foundation level of the Complex shall be designed in a way so that machineries will not be flooded when sea level rises during hurricanes. The soft layer of a foundation will be replaced and paved so that no soil erosion can happen when sea level rises.
14	Soil Erosion	Portion of rain water in surrounding areas is discharged into the Project site.	C	B	Soil erosion may occur at the border of the Project site by discharged rain water during heavy rain. This is because the foundation level of the site will be raised in order to mitigate hurricane damages.	<ul style="list-style-type: none"> The rain water drainage based on precipitation and proper discharging channels shall be included in the plan.
15	Groundwater	Ordinary households in Barbuda Island are not using water from wells. City water comes from groundwater, yet its amount is controlled by APUA.			The Project has no impact on groundwater.	-
16	Hydrological Situation	There is no stream or river flowing into lagoon in and around the Project site.			The Project has no impact on hydrological situation.	-
17	Coastal Zone (Mangroves, Coral reefs, Tidal flats, etc.)	An area along the shoreline of northern half of lagoon is a wetland densely covered by mangroves (mainly composed of <i>Rhizophora mangle</i> and <i>Laguncularia racemosa</i>). The Project site is located in the southern end of said wetland where mangrove density rapidly falls down. There are neither coral reefs nor tidal flats in and around the Project site.	B	B	Some mangrove trees need to be cleared for construction which may negatively impact on ecosystem along the shoreline. Yet, since the mangroves are not as dense as they are in the northern part of lagoon, its negative impact is smaller than having the site in other areas of lagoon.	<ul style="list-style-type: none"> The Project site and allocation of the facilities shall be selected and designed in a way to minimise number of mangroves to be cut. Mangrove trees will be replanted around the Project site after construction in order to mitigate negative impact. The effect of replantation will be monitored.
18	Flora, Fauna and Biodiversity	Codrington Lagoon was designated as a National Park in 2005 while the Project site is also within	B	B	There is a possibility to cause negative impacts on ecosystem in and around the	<ul style="list-style-type: none"> Silt screen will be applied during the civil construction works.

No.	Impact	Current Status	Rating		Outline (Issues Concerned)	Possible Evasive Action/ Mitigation Measures
			During construction	After construction		
		the Park. Wide varieties of flora and fauna inhabit in and around the Project site. Yet, non of 'endangered species' appointed by IUCN was observed. The National Park is managed by the Codrington Lagoon Management Board.			Project site by accidentally discharging waste/muddy water, wastes or oil into the lagoon. There may be a discrepancy between conservation principles set forth by the Codrington Lagoon Management Board and optimal allowable catch set forth by the Fisheries Division.	<ul style="list-style-type: none"> A waste water treatment facility will be planned which meets criteria set forth by the Ministry of Health. Coordination between the Codrington Lagoon Management Board and the Fisheries Division shall be made. Two parties shall also share information on its ecosystem monitoring.
19	Meteorology	<ul style="list-style-type: none"> The area is within the route of hurricanes and damages were caused in the past. Temperature can go beyond 33°C during summer. 			The Project has no impact on meteorology.	<ul style="list-style-type: none"> Measures to mitigate damages caused by hurricanes shall be included in the plan (i.e. levelling up the foundation). Air conditioning of a sanitary control area shall be included in the plan.
20	Landscape	There is a jetty for tourism facing to the lagoon with artificial sand beach on its southern side. Some vessels are moored at the sand beach. Further south of the beach, there are mangrove trees.	B	B	The landscape will change by construction of the Complex.	<ul style="list-style-type: none"> The layout, forms and colours of the Complex shall be well planned so that the Complex will be an appropriate facility to be within the National Park.
21	Global Warming	There is no specific status to be noted regarding global warming.			The Project has no impact on global warming.	
Pollution						
22	Air Pollution	There is no specific status to be noted regarding air pollution.	C		There may be air pollutant emission caused by machineries or vehicles during construction.	<ul style="list-style-type: none"> Regular maintenance of machineries and vehicles will be conducted. Sprinkling water for suppressing dust shall be considered.
23	Water Pollution	The values of pH, DO, SS, salinity level, and COD are all at normal level. The result of coliform bacteria test was also negative.	B	B	There is a possibility of contaminated water being discharged during and after construction.	<ul style="list-style-type: none"> Preparation of a prevention manual and monitoring of waste water discharge will be conducted by a construction supervisor during construction and a complex manager after construction.
24	Soil Contamination	There is no specific status to be noted regarding soil contamination.	B	C	There may be a possibility of soil contamination by cement dust and rinsing liquid for paints	<ul style="list-style-type: none"> Oils, poisonous substance, etc. will be disposed to authorized dump site on Barbuda.

No.	Impact	Current Status	Rating		Outline (Issues Concerned)	Possible Evasive Action/ Mitigation Measures
			During construction	After construction		
				After construction	during construction. There may be a possibility of soil contamination by machinery oil from workshops when O&M of the Complex starts.	<ul style="list-style-type: none"> Grease trap will be installed for waste water before entering waste water treatment system Waste oil tank will be provided to the workshop
25	Wastes	There is no specific status to be noted regarding wastes.	B	B	Refer to No. 11	<ul style="list-style-type: none"> Refer to No. 11
26	Noise and Vibration	There is no specific status to be noted regarding noise and vibration.	C		There may be some noise and vibration generated from machineries and vehicles during construction. Yet, since the Project site is located on downwind of residential area, the impact is expected to be minimal.	<ul style="list-style-type: none"> Machines with low noise and less vibration will be used. No construction works will be conducted during evening hours and Sunday morning.
27	Ground Subsidence	There is no specific status to be noted. There is a layer of coral rock bed with more than 50 N value underneath the Project site.				
28	Offensive Odour	The soft layer of a foundation across the shoreline is composed of organic silt and clay. The organic silt is in anaerobic decomposition process which generates offensive odour when exposed to the air.		B	During replacement of soft layer of a foundation, there will be some level of offensive odour where organic silt is temporary piled. However, since the Project site is located on downwind of residential area, the odour is expected to be discharged towards the lagoon. Water used for cleaning fresh fish can be a potential source of offensive odour during O&M of the Complex.	<ul style="list-style-type: none"> A waste water treatment facility will be planned which meets criteria set forth by the Ministry of Health. Solid wastes will be stored in the garbage bin with a lid (see No. 11)
29	Bottom sediment	The bottom sediment in and around the Project site is composed of soft silt covered by perennial sea weeds. Therefore, there expected to be minimal movement of bottom sediment. Through observation and information gathered from local communities, a tidal current within lagoon is small enough not to be disturbing bottom sediment.		B	There may be some silt to be accumulated in the water area between envisioned jetty and existing jetty.	<ul style="list-style-type: none"> A culvert will be installed to the envisioned jetty to minimize water stagnation between two jetty.

No.	Impact	Current Status	Rating		Outline (Issues Concerned)	Possible Evasive Action/ Mitigation Measures
			During construction	After construction		
30	Accidents	There is no specific status to be noted regarding accidents.	B	C	<p>There are possible risks of threatening one's life or damaging the environment through: discharging toxic materials; fire; explosion; traffic accidents; and natural calamities (high tide, gale) during construction. Damages caused by hurricanes are also anticipated after construction.</p>	<ul style="list-style-type: none"> As setting up appropriate notices and promoting active information sharing with communities, cooperation should also be requested to the primary school and the kindergarten adjacent to the Project site. Construction workers will be repeatedly reminded on safety control, and a construction site will be fenced. Construction materials shall be handled and stored in a proper manner, especially the ones which are inflammable and explosive. Based on past damages caused by hurricanes, the foundation level of facilities and introduction of hurricane shutters shall be considered during designing of the facility.

Rating:

A: Serious impact is expected; B: Some impact is expected; C: Extent of impact is unknown; No mark: No impact is expected; +: Positive impact is expected.

(10) Environmental Checklist: 17. Ports and Harbors

Environ. Item	Main Check Items	Confirmation of Environmental Considerations
(1) EIA and Environmental Permits	<p>① Have EIA reports been officially completed?</p> <p>② Have EIA reports been approved by authorities of the host country's government?</p> <p>③ Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied?</p> <p>④ In addition to the above approvals, have other required environmental permits been obtained from the appropriate regulatory authorities of the host country's government?</p>	<p>① DCA has jurisdiction over approving development activities and obliging EIA. DCA assesses a project which needs EIA and requests necessary procedures to be taken by the Project executor based on the Physical Planning Act 2003. Since the Project includes constructions of a port and a waste water treatment facility, the Project executor is ought to be obliged to conduct EIA. However, since the Project Basic Design report being prepared by the JICA Preparatory Study Team fulfills required contents of an EIA report, DCA considers the submission of the EIA report is not required.</p> <p>② and ③ Same as above</p> <p>④ In Antigua & Barbuda, the National Park Authority supervises the management of National Parks based on the National Park Act 1984. However, the management and supervision of National Parks in Barbuda Island falls under the authority of Barbuda council as it is stipulated in the Barbuda Local Government Act 1976. Legal procedures for the implementation of the Project is that the Fisheries Division to obtain a development permission from DCA while obtain an approval from the Barbuda council. Which the Barbuda council has already approved the Project.</p>
(2) Explanation to the Public	<p>① Are contents of the project and the potential impacts adequately explained to the public based on appropriate procedures, including information disclosure? Is understanding obtained from the public?</p> <p>② Are proper responses made to comments from the public authorities?</p>	<p>① The Fisheries Division facilitated several stakeholders meetings during the field survey at Barbuda Island. The objectives and contents of the Project were well explained and comments given by the stakeholders were well studied. The survey team shared information and reached a consensus on the Project with the Fisheries Division and Barbuda council through numbers of discussion.</p> <p>② Same as above</p>
(1) Air Quality	<p>① Do air pollutants, such as sulfur oxides (SOx), nitrogen oxides (NOx), and soot and dust emitted from various sources, such as ships, vehicles, and the ancillary facilities comply with the country's emission standards and ambient air quality standards?</p>	<p>The draft Environmental Protection and Management Bill, 2005 indicates necessity of setting up emission standards and ambient air quality standards and their execution. However the said bill was not yet adopted when the Project field survey was conducted.</p> <p>Under the Project, regular maintenance of machineries and vehicles will be conducted. Simultaneously, sprinkling water for suppressing dust shall also be considered.</p>

(2) Water Quality	<p>① Do general effluents from the related facilities comply with the country's effluent standards and ambient water quality standards?</p> <p>② Do effluents from ships and ancillary facilities (e.g., dock) comply with the country's effluent standards and ambient water quality standards?</p> <p>③ Are adequate measures taken to prevent spills and discharges of materials, such as oils and hazardous materials to the surrounding water areas?</p> <p>④ Is there a possibility that oceanographic changes, such as alteration of ocean currents, and reduction in seawater exchange rates (deterioration of seawater circulation) due to modification of water areas, such as shoreline modifications, reduction in water areas, and creation of new water areas will cause changes in water temperature and water quality?</p> <p>⑤ In the case of the projects including land reclamation, are adequate measures taken to prevent contamination of surface water, seawater, and groundwater by leachates from the reclamation areas?</p>	<p>① & ② Central Board of Health, Ministry of Health adopts effluent and ambient water quality standards of CARICOM based on US-EPA standards. Based on the said standards, preparation of a prevention manual and monitoring of effluent and ambient water quality will be conducted by a construction supervisor during construction and a complex manager after construction.</p> <p>③ In principle, oils and hazardous materials shall be removed from the Complex under the responsibility of whom brought said materials into the Complex. Oil contents in discharged water will be trapped in grease traps and collected. There will also be oil tanks provided for waste oils.</p> <p>④ A forty-meter jetty will be constructed in perpendicular to an existing shoreline. There is also an existing jetty with similar length in parallel to a planned jetty which may cause stagnation of water between two jetties. As it will be explained in 3 (3), waves are unlikely to be formed along the shoreline where the site is located. The tidal current is also minimal. Therefore, there are expected to be no major shoreline modifications. However, there may be deposits in above mentioned water area. The Project will introduce a culvert in the jetty in order to mitigate stagnation of water.</p> <p>⑤ The ground level is raised as a measure to rising sea water level during hurricanes. Yet, leachates or soil runoff is prevented by introducing geotechnical sheets along the shore of reclamation areas.</p>
(3) Wastes	<p>① Are wastes from ships and the related facilities properly treated and disposed of in accordance with the country's standards?</p> <p>② Is offshore dumping of dredged soils properly performed in accordance with the country's standards to prevent impacts on the surrounding waters?</p> <p>③ Are adequate measures taken to prevent discharge or dumping of hazardous materials to the surrounding water areas?</p>	<p>① & ② The garbage bin with a lid will be introduced within the Complex in coordination with existing garbage collection system. A worker in charge of waste management shall be posted.</p> <p>③ Same as 2 (2) ③</p>
(4) Noise and Vibration	<p>① Do noise and vibrations comply with the country's standards?</p>	<p>Noise Abatement Act has been adopted in 1996. The Project shall take an appropriate measure approved by the Ministry of Health. The construction does not accompany processes such as piling which generate big noise. Simultaneously, the Project site is located on downwind of residential area, the impact is expected to be minimal. The Project shall handle machines with care to minimise noise.</p>
(5) Odor	<p>① Are there any odor sources? Are adequate odor control measures taken?</p>	<p>During replacement of soft layer of a foundation, there will be some level of offensive odour where organic silt is temporary piled. However, since the Project site is located on downwind of residential area, the odour is expected to be discharged towards the lagoon. Therefore negative impact is expected to be minimal. A waste water treatment facility will be planned which meets criteria set forth by the Ministry of Health to prevent offensive odour from discharged water from cleaning fish. Solid wastes will be stored in the garbage bin with a lid and collected regularly.</p>

(6) Sediment	<p>① Are adequate measures taken to prevent contamination of sediments by discharges or dumping of materials.</p> <p>① Is the project site located in protected areas designated by the country's laws or international treaties and conventions? Is there a possibility that the project will affect the protected areas?</p>	<p>The activities at the Complex does not accompany hazardous materials. Thus, contamination of sediments by discharges or dumping said materials is not expected under the Project.</p>
(1) Protected Areas	<p>① Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)?</p> <p>② Does the project site encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions?</p> <p>③ If significant ecological impacts are anticipated, are adequate protection measures taken to reduce the impacts on the ecosystem?</p> <p>④ Is there a possibility that the project will adversely affect aquatic organisms? If significant impacts are anticipated, are adequate protection measures taken to reduce the impacts on aquatic organisms?</p> <p>⑤ Is there a possibility that the project will adversely affect vegetation and wildlife of coastal zones? If significant impacts are anticipated, are adequate measures taken to reduce the impacts on vegetation and wildlife?</p>	<p>Codrington Lagoon was designated as a National Park in 2005 while the Project site is also facing to the lagoon. There is a possibility to cause negative impacts on ecosystem in and around the Project site by accidentally discharging waste/ muddy water, wastes or oil into the lagoon. A prevention measure for discharging muddy water during construction will be thought through while a waste water treatment facility will be planned which meets criteria set forth by the Ministry of Health. The Fisheries Division shall monitor discharged water quality from the Complex and collect periodical fisheries statistical data. Fisheries Division shall also actively share information and coordinate activities on ecosystem monitoring with the Codrington Lagoon Management Board.</p>
(2) Ecosystem	<p>① Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)?</p> <p>② Does the project site encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions?</p> <p>③ If significant ecological impacts are anticipated, are adequate protection measures taken to reduce the impacts on the ecosystem?</p> <p>④ Is there a possibility that the project will adversely affect aquatic organisms? If significant impacts are anticipated, are adequate protection measures taken to reduce the impacts on aquatic organisms?</p> <p>⑤ Is there a possibility that the project will adversely affect vegetation and wildlife of coastal zones? If significant impacts are anticipated, are adequate measures taken to reduce the impacts on vegetation and wildlife?</p>	<p>An area along the shoreline of northern half of lagoon is a wetland densely covered by mangroves (mainly composed of <i>Rhizophora mangle</i> and <i>Laguncularia racemosa</i>). The Project site is located in the southern end of said wetland where mangrove density rapidly falls down.</p> <p>There are neither coral reefs nor tidal flats in and around the Project site. Some mangrove trees need to be cleared for construction which may negatively impact on ecosystem along the shoreline. Yet, the Project site and allocation of the facilities was selected and designed in a way to minimise number of mangroves to be cut. Mangrove trees will be replanted through facilitation of the Fisheries Division around the Project site after construction in order to mitigate the impact.</p> <p>Wide varieties of flora and fauna inhabit in and around the Project site. Therefore, the Project plans a waste water treatment facility which meets criteria set forth by the Ministry of Health in order to keep water quality of the lagoon. On the other hand, two species of sea turtles namely: <i>Eretmochelys imbricata</i> and <i>Dermochelys coriacea</i> which are designated as 'endangered species' by IUCN are not observed in and around the Project site. The only endangered species found around the Project site in the past was West Indian Whistling Duck (<i>Dendrocygna arborea</i>). Because the said species is found in wide area of the lagoon and it does not nest near the Project site, the negative impact caused by the Project on said species is expected to be minimal.</p>
(3) Hydrology	<p>① Is there a possibility that installation of port and harbor facilities will cause oceanographic changes? Is there a possibility that installation of the facilities will adversely affect oceanographic conditions, such as induced currents, waves, and tidal currents?</p>	<p>Since the Complex is located at the lowest reaches of an island water system, the Project will not cause any alteration in its system. The shoreline of the Project site is unlikely to be altered by waves or currents since it is on the downwind side from northeast. The water depth of the lagoon is shallow (1-2m). There is neither strong current nor big waves which causes changes on oceanographic conditions by introducing a Complex at its shoreline.</p>
(4) Topography and Geology	<p>① Is there a possibility that installation of port and harbor facilities will cause a large-scale alteration of topographic and geologic features in the surrounding areas or elimination of natural beaches?</p>	<p>Same as 2 (2) ④</p>
(1) Resettlement	<p>① Is involuntary resettlement caused by project implementation? If involuntary resettlement is caused, are efforts made to minimize the impacts caused by the resettlement?</p>	<p>The Project site is not a residential area. Therefore, there will be no involuntary resettlement.</p>

	<p>② Is adequate explanation on relocation and compensation given to affected persons prior to resettlement?</p> <p>③ Is the resettlement plan, including proper compensation, restoration of livelihoods developed based on socioeconomic studies on resettlement?</p> <p>④ Does the resettlement plan pay particular attention to vulnerable groups or persons, including women, children, the elderly, people below the poverty line, ethnic minorities, and indigenous peoples?</p> <p>⑤ Are agreements with the affected persons obtained prior to resettlement?</p> <p>⑥ Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the plan?</p> <p>⑦ Is a plan developed to monitor the impacts of resettlement?</p>	
(2) Living and Livelihood	<p>① Is there a possibility that the project will adversely affect the living conditions of inhabitants? Are adequate measures considered to reduce the impacts? ② Is there a possibility that changes in water uses (including fisheries and recreational uses) in the surrounding areas due to project will adversely affect the livelihoods of inhabitants? ③ Is there a possibility that port and harbor facilities will adversely affect the existing water traffic and road traffic in the surrounding areas? ④ Is there a possibility that diseases, including communicable diseases, such as HIV will be introduced due to immigration of workers associated with the project? Are considerations given to public health, if necessary?</p>	<p>① Excessive power usage is concerned during construction. A construction supervisor shall check power usage status regularly during construction period. Both city and rain water need to be stored well in advance. Rain water shall also be actively used even after construction. Monitoring of water usage will be conducted by a construction supervisor during construction and a Complex manager after construction in coordination with APUA. ② Though vessels moored at the Project site need to be moved during construction, consensus is already made with fishers and an alternative mooring site is identified. The Project site is adjacent to an existing jetty for tourism. Any negative impacts will be mitigated by introducing a buffer zone between the Project site and the site for tourism. ③ The Project does not plan to block any existing roads. As one of the safety measures, the Project facilitate Barbuda council to set up appropriate notices and promote active information sharing with communities. Construction workers will also be told to follow any safety measures set forth. Cooperation should also be requested to the primary school and the kindergarten adjacent to the Project site. A construction site will be fenced in order to prevent accidents. ④ There may be a risk that workers from outside of the Island spreading infectious diseases. Workers can be enlightened on HIV/AIDS and other infectious diseases through activities currently conducted by 'Antiguan AIDS Secretariat' and 'Health hope & HIV foundation' (i.e. posters, pamphlets and workshops). There is no local archaeological, historical, cultural, and religious heritage adjacent to the Project site.</p>
(3) Heritage	<p>① Is there a possibility that the project will damage the local archaeological, historical, cultural, and religious heritage sites? Are adequate measures considered to protect these sites in accordance with the country's laws?</p>	
(4) Landscape	<p>① Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?</p>	<p>An introduction of the Complex may have some changes (not necessarily adversely affect) on the local landscape. Therefore, the layout, forms and colours of the Complex shall be well planned.</p>
(5) Ethnic Minorities and Indigenous Peoples	<p>① Does the project comply with the country's laws for rights of ethnic minorities and indigenous peoples?</p> <p>② Are considerations given to reduce the impacts on culture and lifestyle of ethnic minorities and indigenous peoples?</p>	<p>The population of Barbuda Island is 1,325 (National Census, 2001) and majority is African descendants. There is neither ethnic minorities nor indigenous peoples whom to be specifically noted.</p>

<p>(1) Impacts during Construction</p>	<p>① Are adequate measures considered to reduce impacts during construction (e.g., noise, vibrations, turbid water, dust, exhaust gases, and wastes)?</p> <p>② If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts?</p> <p>③ If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts?</p> <p>④ If necessary, is health and safety education (e.g., traffic safety, public health) provided for project personnel, including workers?</p>	<p>① Refer to '2 Mitigation Measures' for mitigation measures towards pollutions during construction.</p> <p>② Refer to '3 Natural Environment' for mitigation measures towards impacts on natural environment (ecosystem)</p> <p>③ Refer to '4 Social Environment' for mitigation measures towards impacts on social environment</p> <p>④ Refer to '4 Social Environment (2) Living and Livelihood' for health and safety education for project personnel and workers</p>
<p>(2) Monitoring</p>	<p>① Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts?</p> <p>② Are the items, methods and frequencies included in the monitoring program judged to be appropriate?</p> <p>③ Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and adequate budget to sustain the monitoring framework)?</p> <p>④ Are any regulatory requirements pertaining to the monitoring report system identified, such as the format and frequency of reports from the proponent to the regulatory authorities?</p>	<p>A construction supervisor will look into mitigation measures towards pollution during construction including water quality and solid waste management. A complex manager will monitor water quality, solid waste management and conditions of bottom sediment after construction.</p> <p>The Fisheries Division shall collect periodical fisheries statistical data. The Codrington Lagoon Management Board shall monitor overall environmental conditions of the Codrington Lagoon.</p>
<p>Note on Using Environmental Checklist</p>	<p>① Where necessary, impacts on groundwater hydrology (groundwater level drawdown and salinization) that may be caused by alteration of topography, such as land reclamation and canal excavation should be considered, and impacts, such as land subsidence that may be caused by groundwater uses should be considered. If significant impacts are anticipated, adequate mitigation measures should be taken.</p> <p>② If necessary, the impacts to transboundary or global issues should be confirmed (e.g., the project includes factors that may cause problems, such as transboundary waste treatment, acid rain, destruction of the ozone layer, and global warming).</p>	<p>① There is no plan under the Project for the direct groundwater usage. There is a layer of rock bed with N value above 50 underneath the Project site meaning that the Project is unlikely to have impact on land subsidence.</p> <p>② There expected no global environmental impact caused by the Project.</p>

Attached Table 1 Active fishing boat census for Barbuda (2008)

Base of operations	Boat length	Type	Main method of fishing	Hull material	Engine	Hp
PL	13ft	Open	G. net	FRP	Outboard	30
PL	13ft	Open	G. net	FRP	Outboard	40
PL	13ft	Open	F. dive/loop	FRP	Outboard	25
PL	13ft	Open	F. dive/loop	FRP	Outboard	25
PL	14ft	Open	Trap	FRP	Outboard	40
PL	(22ft)	Open	Trap	FRP	Outboard	40x2
PL	22ft	Open	F. dive/loop	FRP	Outboard	40
PL	22ft	Open	Scuba/loop	FRP	Outboard	40
PL	(23ft)	Open	Scuba/loop	FRP	Outboard	40
PL	23ft	Open	Scuba/loop	FRP	Outboard	40
PL	25ft	Open	Trap	FRP	Outboard	90
PL	25ft	Open	Trap	FRP	Outboard	40
CW	13ft	Open	G. net	FRP	Outboard	15
CW	13ft	Open	G. net	FRP	Outboard	40
CW	13ft	Open	F. dive/loop	FRP	Outboard	25
CW	13ft	Open	F. dive/loop	FRP	Outboard	25
CW	13ft	Open	Trap	FRP	Outboard	25
CW	13ft	Open	Trap	FRP	Outboard	25
CW	16ft	Open	F. dive/loop	FRP	Outboard	25
CW	16ft	Open	F. dive/loop	FRP	Outboard	90
CW	16ft	Open	F. dive/loop	FRP	Outboard	25
CW	20ft	Open	Trap	FRP	Outboard	25
CW	22ft	Open	Trap	FRP	Outboard	40
CW	(22ft)	Open	Scuba/loop	FRP	Outboard	40
CW	22ft	Open	Trap	FRP	Outboard	60
CW	23ft	Open	Trap	FRP	Outboard	40
CW	23ft	Open	Trap	FRP	Outboard	40
CW	25ft	Open	Trap	FRP	Outboard	60
CW	25ft	Open	Trap	FRP	Outboard	40
CW	25ft	Open	Trap	FRP	Outboard	40
CW	25ft	Open	Trap	FRP	Outboard	40
CW	25ft	Open	Trap	FRP	Outboard	?
CW	25ft	Open	Trap	FRP	Outboard	85
CW	29ft	Open	Trap	FRP	Outboard	60, 65
CW	(40ft)	Launch	Trap	FRP	Inboard	200
RV	21ft	Open	F. dive/loop	FRP	Outboard	40
RV	21ft	Open	Scuba/loop	FRP	Outboard	40
RV	22ft	Open	Scuba/loop	FRP	Outboard	40
RV	23ft	Open	Scuba/loop	FRP	Outboard	40
RV	25ft	Open	Trap	FRP	Outboard	75
RV	34ft	Launch	Trap	FRP	Inboard	?
RV	46ft	Launch	Trap	FRP	Inboard	210
RV	55ft	Launch	Trap	FRP	Inboard	?
RV	58ft	Launch	Trap	FRP	Inboard	250x2

Source: Vessel Frame Survey 2008, Department of Fisheries, Antigua and Barbuda Ministry of Agriculture Lands, Marine Resources and Agro Industries

Note: PL = Pearl Harbour, CW = Codrington wharf, RV = River mooring wharf, F. dive/loop = spear fishing / lobster loop pole, Parentheses “()” = indicate boats operating from Coco Point during the tourist season

Attached Table 2 Estimated catch quantity by boat size and by fishing method

Landing place	Main Fishing Method										
	Trap				Fish Diving			Gill Net			
	Feet (Hp)	Fish Type	Catch (pond/time)		Feet (Hp)	Catch (pond/time)		Feet (Hp)	Catch (pond/time)		
	M. F. T.		Tourist s.	Off s.	M. F. T.	Tourist s.	Off s.	M. F. T.	Tourist s.	Off s.	
Pearl Habour	14(40)	Lobster	40	30	13(25)	27	22	13(25)	(-)	(-)	
	5times	Fishes	50	25	6times	35	29	8times	35	25	
	22(40)	Lobster	50	30	13(40)	40	30	13(30)	(-)	(-)	
	8times	Fishes	40	30	6times	70	60	8times	35	25	
	25(90)	Lobster	(-)	120	22(40)	50	30	--			
	4times	Fishes	(-)	60	6times	30	30	--			
	25(-)	Lobster	40	25	22(40x2)	(-)	30	--			
	4times	Fishes	40	30	8 times	(-)	30	--			
	--				23(40)	(-)	30	--			
	--				6times	(-)	30	--			
	--				23(40)	40	30	--			
	--				6times	30	30	--			
Sub-total	4 boats				6 boats			2 boats			
Codrn.	13(25)	Lobster	45	35	13(15)	30	20	13(25)			
	8times	Fishes	30	20	6times	40	30	8times			
	13(25)	Lobster	40	30	13(-)	40	20	13(40)			
	8times	Fishes	50	25	6times	35	30	8times			
	20(-)	Lobster	30	25	16(25)	15	15	--			
	4times	Fishes	40	35	4&6times	60	50	--			
	22(40)	Lobster	35	30	16(25)	40	30	--			
	8times	Fishes	(-)	(-)	8&6times	10	8	--			
	22(40)	Lobster	55	45	16(90)	30	20	--			
	6times	Fishes	60	50	6&10times	30	30	--			
	22(60)	Lobster	(-)	(-)	22(40)	(-)	70	--			
	6times	Fishes	60	60	8times	(-)	50	--			
	23(40)	Lobster	60	45	--						
	6times	Fishes	50	40	--						
	25(40)	Lobster	40	25	--						
	4times	Fishes	40	30	--						
	25(40)	Lobster	40	30	--						
	4&6times	Fishes	50	40	--						
	25(48)	Lobster	(-)	(-)	--						
	4&6times	Fishes	80	70	--						
	25(60)	Lobster	50	40	--						
	4&6times	Fishes	60	50	--						
	25(85)	Lobster	60	45	--						
	5times	Fishes	70	50	--						
	25(170)	Lobster	30	20	--						
	8imes	Fishes	50	30	--						
	29(65x2)	Lobster	70	60	--						
6times	Fishes	45	20	--							
40(355)	Lobster	(-)	70	--							
5times	Fishes	(-)	80	--							
Sub-total	15 boats				6 boats			2 boats			
River	25(40)	Lobster	30	30	21(40)	50	45	--			
	6times	Fishes	80	60	10 times	30	30	--			
	34(-)	Lobster	150	70	21(40)	50	40	--			
	4&6times	Fishes	100	80	10 times	(-)	(-)	--			
	46(210)	Lobster	150	70	22(40)	50	40	--			
	4&6times	Fishes	100	80	8 times	20	20	--			
	55(671Gm)	Lobster	300	150	23(40)	55	45	--			
	4&6times	Fishes	200	150	8 times	40	30	--			
	58(250x2)	Lobster	150	70	--						
4&6times	Fishes	100	80	--							
Sub-total	5 boats				4 boats			--			
Coco	40(355)	Lobster	150	(-)	22(40)	50	(-)	--			
	5times	Fishes	100	(-)	8 times	30	(-)	--			
		Lobster			22(40x2)	50	(-)	--			
		Fishes			8 times	30	(-)	--			
		Lobster			23(40)	40	(-)	--			
	Fishes			6 times	30	(-)	--				
Sub-total	Tourist season 1 boat				Tourist season 3 boats			--			
Grand Total	24 boats				16 boats			4 boats			

Source: Barbuda fisheries baseline survey, 2009, JICA Preparatory Survey Team

Note: Asterisk "*" denotes samples under the Barbuda fishing operations baseline survey. In the case of fishing boats not designated with an asterisk, the average catch quantity value for boats of a comparable size that were actually sampled is applied as the catch quantity per fishing operation.

Attached Table 3 Monthly catch quantity by fishing method

Landing Place	Main Fishing Method									
	Trap				Diving/loop				Gill net	
	Feet (Hp)	Fish type	Catch (Lb/mon.)		Feet (Hp)	Catch (Lb/mon.)		Feet (Hp)	Catch (Lb/mon.)	
		Tourist s.	Off s.		Tourist s.	Off s.		Tourist s.	Off s.	
Pearl Harbour	14(40)	Lobster	200	150	13(25)	162	132	13(25)	(-)	(-)
		Fishes	250	125		210	174		280	200
	22(40)	Lobster	400	240	13(40)	240	180	13(30)	(-)	(-)
		Fishes	320	240		420	360		280	200
	25(90)	Lobster	(-)	480	22(40)	300	180	-		
		Fishes	(-)	240		420	180			
	25(-)	Lobster	160	100	22(40x2)	(-)	240	-		
		Fishes	160	120		(-)	240			
		Lobster			23(40)	(-)	180	-		
		Fishes				(-)	180			
		Lobster			23(40)	240	180	-		
		Fishes				180	180			
Sub total		Lobster	760	970	Lobster	942	1,092	Lobster	(-)	(-)
		Fishes	730	725	Fishes	1,230	1,314	Fishes	560	400
Codrn.	13(25)	Lobster	360	280	13(15)	180	120	13(25)	(-)	(-)
		Fishes	240	160		240	180		280	200
	13(25)	Lobster	320	240	13(-)	240	120	13(40)	(-)	(-)
		Fishes	400	200		210	180		800	640
	20(-)	Lobster	120	100	16(25)	60	90			
		Fishes	160	140		240	300			
	22(40)	Lobster	280	240	16(25)	320	180			
		Fishes	(-)	(-)		80	48			
	22(40)	Lobster	330	270	16(90)	180	200			
		Fishes	360	300		180	300			
	22(60)	Lobster	(-)	(-)	22(40)	(-)	560			
		Fishes	360	360		(-)	400			
	23(40)	Lobster	360	270						
		Fishes	300	240						
	25(40)	Lobster	160	100						
		Fishes	160	120						
	25(40)	Lobster	160	180						
		Fishes	200	240						
	25(48)	Lobster	(-)	(-)						
		Fishes	320	420						
	25(60)	Lobster	200	240						
		Fishes	240	300						
	25(85)	Lobster	300	225						
		Fishes	350	250						
	25(170)	Lobster	240	160						
		Fishes	400	240						
	29(65x2)	Lobster	420	360						
		Fishes	270	120						
	40(355)	Lobster	(-)	350						
		Fishes	(-)	400						
Sub total		Lobster	3,250	3,875	Lobster	980	1,270	Lobster	(-)	(-)
		Fishes	3,760	3,490	Fishes	950	1,408	Fishes	1,080	840
River	25(40)	Lobster	180	180	21(40)	500	450			
		Fishes	480	360		300	300			
	34(-)	Lobster	600	420	21(40)	500	400			
		Fishes	400	480		(-)	(-)			
	46(210)	Lobster	600	420	22(40)	400	320			
		Fishes	400	480		160	160			
	55(671Gm)	Lobster	1,200	900	23(40)	440	360			
		Fishes	800	900		320	240			
	58(250x2)	Lobster	600	420						
		Fishes	400	480						
Sub total		Lobster	3,180	2,340	Lobster	1,840	1,530	Lobster	(-)	(-)
		Fishes	2,480	2,700	Fishes	780	780	Fishes	(-)	(-)
Coco	40(355)	Lobster	750	(-)	22(40)		(-)			
		Fishes	500	(-)			(-)			
		Lobster			22(40x2)		(-)			
		Fishes					(-)			
		Lobster			23(40)		(-)			
		Fishes					(-)			
Sub total		Lobster	750	(-)	Lobster	1,040	(-)	Lobster	(-)	(-)
		Fishes	500	(-)	Fishes	660	(-)	Fishes	(-)	(-)
G. Total		Lobster	7,949	7,185	Lobster	4,802	3,892	Lobster	(-)	(-)
		Fishes	7,470	6,915	Fishes	3,620	3,502	Fishes	1,640	1,240

Monthly catch quantity at Barbuda:

Type of catch	Tourist season: lbs/mo. (kg/mo.)	Off season: lbs/mo. (kg/mo.)
Lobster	12,742 (5,780)	11,077 (5,024)
Fish	12,730 (5,774)	11,657 (5,288)
Total	25,472 (11,554)	22,734 (10,312)

Lobster: $[12742 \times 7] + [11077 \times 5] = 144579$ lbs/year 65.6 tons/year

Fish: $[12730 \times 7] + [11657 \times 5] = 147395$ lbs/year 66.8 tons/year

Attached Table 4 Trend in per capita fishery product consumption in Antigua and Barbuda

Per capita fishery product consumption (g/person/year)			
Consumption item	1990 - 1992	1995 - 1997	2003 – 2005
Freshwater fish	1	1	3
Demersal fish	17	64	52
Pelagic fish	1	11	23
Other marine fish	91	50	13
Shellfish	9	4	35
Mollusk, other	7	12	16
Total	126 (46.0kg/pern/yr.)	142 (51.8kg/pern/yr.)	142 (51.8kg/pern/yr.)

Source: FAO fishery statistics

Attached Table 5 Marine product import quantities in Antigua and Barbuda (1998~2005)

Unit: metric tons

Year	1998	1999	2000	2001	2002	2003	2004	2005
Total quantity of imported edible marine products	394	564	470	439	737	1653	1442	1553
Fresh fish / refrigerated and frozen fish	7	119	71	7	269	363	504	461
Salt-cured, dried-salted and smoke-cured fish	327	339	340	310	331	370	480	536
Shellfish/mollusk	19	2	6	4	75	827	325	206
Canned fish	40	102	50	115	60	88	130	330
Canned shellfish/mollusk	1	2	3	3	2	5	3	20

Source: FAO fishery statistics

Note: Only edible marine products

Attached Table 6 Landed catch quantities (MT) by type of fish

Unit: metric tons

Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Total for all types of fish	1013	1041	1164	1274	1779	1875	1728	2162	2280	2257
Tuna	NA	NA	NA	28	12	NA	5	59	22	28
Dolphin	NA	NA	NA	4	7	NA	10	13	9	10
Shark, ray	NA	NA	NA	8	17	NA	29	17	44	30
Boxfish	NA	NA	NA	66	38	NA	66	81	101	81
Scalpel sawtail	NA	NA	NA	158	237	NA	141	254	289	259
Parrotfish	NA	NA	NA	173	252	NA	225	202	278	285
Snapper	NA	NA	NA	284	348	NA	411	296	320	420
Grouper	NA	NA	NA	217	364	NA	398	455	463	454
Grunt	NA	NA	NA	167	259	NA	184	410	385	322
Squirrelfish	NA	NA	NA	29	45	NA	13	32	78	50
Triggerfish	NA	NA	NA	18	83	NA	89	61	124	102
Drummer	NA	NA	NA	8	4	NA	6	9	3	9
Seabream	NA	NA	NA	9	15	NA	16	40	30	28
Sawtooth barracuda	NA	NA	NA	6	8	NA	33	13	12	20
Scad	NA	NA	NA	33	34	NA	65	98	43	72
Blue striped angelfish	NA	NA	NA	0	0	NA	4	12	15	17
Leatherfish	NA	NA	NA	0	0	NA	2	2	2	11
Other fish types	NA	NA	NA	66	13	NA	31	108	62	59
Lobster	357	274	275	272	276	243	245	309	318	318
Conch	45	46	42	37	42	62	74	70	66	69
Total	1415	1361	1481	1583	2097	2160	2047	2541	2664	2644

Source: Fisheries Division statistics

Attached Table 7 Fish sales prices in Barbuda and Antigua

Fish Type	Barbuda				Antigua			
	Tourist s.		Off s.		Tourist s.		Off s.	
	Price (EC\$/lb)	No. of answer	Price (EC\$/lb)	No. of answer	Price (EC\$/lb)	No. of answer	Price (EC\$/lb)	No. of answer
Lobster					20	1		
					18	2	18	2
					16	1	16	2
	15	12						
	14	6						
	13	6	13	13				
	12	2	12	12				
			11	1				
			10	1				
	8 to village	2	8 to village	1				
NA	2	NA	2	NA	26	NA	26	
Sea Breems					15	1	15	1
					14	1	14	1
	13	1			13	2	13	2
	12	3	12	1				
			11	3				
	10	8	10	6				
	9	2	9	3				
	8	3	8	3				
NA	13	NA	14	NA	26	NA	26	
Groupers					14	1	14	1
					13	2	13	2
	12	5			12	1	12	2
			11	4				
	10	8	10	8				
	9	3	9	4				
	8	2	8	3				
NA	12	NA	11	NA	26	NA	26	
Other Reef Fishes	10	2	10	2	10	2	10	2
	9	10	9	10	9	2	9	2
	8	7	8	7				
	7	4	7	5				
	6	7	6	5	NA	26	NA	28
Off shore Pelagics					15	1	15	1
					13	1	13	1
	12	1	12	1				
	10	13	10	11				
	9	3	9	5				
NA	13	NA	13	NA	28	NA	28	
Conch	10 to hotel	3			12	1	12	1
	9	1			10	1	10	1
	60/dozen	10	60/dozen	15				
	50/dozen	1						
	NA	15	NA	15	NA	28	NA	28

Source: Barbuda fisheries baseline survey, 2009, JICA Preparatory Survey Team

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