

Ministry of Environment, Natural Resources,
Physical Planning and Fisheries
The Commonwealth of Dominica

**PREPARATORY SURVEY REPORT
ON
THE PROJECT FOR IMPROVEMENT
OF FISHERY EQUIPMENT AND MACHINERY
IN
THE COMMONWEALTH OF DOMINICA**

FEBRUARY 2015

**JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
OAFIC CO., LTD.**

RD
JR
15-008

PREFACE

Japan International Cooperation Agency (JICA) decided to conduct the preparatory study and entrust the survey to OAFIC, Co., Ltd.

The survey team had a series of discussions with the officials concerned of the Government of the Commonwealth of Dominica, and conducted field investigations. As a result of further studies in Japan, the present report was finalized.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

Finally, I wish to express my sincere appreciation to the officials concerned of the Government of the Commonwealth of Dominica for their close cooperation extended to the survey team.

February, 2015

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SUMMARY

1. Country Profile

The Commonwealth of Dominica is an island nation in the Eastern Caribbean. It has a population of approximately 71,000 (World Bank, 2013) and covers an area of 790km². It is bounded on the west by the Caribbean Sea and on the east by the Atlantic Ocean. The country's gross national income (GNI) is US\$490 million and the GNI per capita is US\$6,760 (World Bank, 2013), ranking it toward the bottom of the nations of the Eastern Caribbean. The economy is rooted in small-scale manufacturing centered on agroindustry, primarily banana growing and soap-making. Compared to other Caribbean nations, tourism in Dominica has been slow to develop, but the government has been putting more effort into attracting tourists with its scenic natural resources. Covered in virgin tropical forests, Dominica is often called the Nature Island of the Caribbean. Although the primary industries on Dominica are agriculture, tourism and manufacturing (e.g., soap), the government is promoting the diversification of the fishery industry and defines it as an important engine of economic growth.

2. Project Background and Outline

Since 2004, fishery industry production in Dominica has hovered between 600 and 700 tons per year. Because the island's precipitous topography gives Dominica only a small area of shallow sea along its coastline, its fishery has developed primarily around pelagic fish which occupies about 90% of total catch. Since the 1990s, the country has installed fish aggregating devices (FAD) for the purpose of forming offshore fishing grounds. Although Dominica has more FADs than any other eastern Caribbean country, the precise number of FADs there is unknown. Looking to ensure the sustainable use of pelagic fishery resources, the Government of the Commonwealth of Dominica is attempting to shift to managed fishery by establishing laws governing the management of FADs. However, the offshore fishery environment is unstable and a number of related issues must be tackled, among them the development of little-used resources and supervision of illegal fishery.

In Dominica, fisheries facilities have been developed in three locations (Roseau, Marigot, and Portsmouth) through past grant aid projects. Although these facilities have been used effectively to improve the distribution of fishery products in the country, cases of aging in some of the larger equipment, such as ice-making and refrigeration equipment, have become apparent. As a result, storage and distribution of fresh fish are being restricted in some regions by insufficient ice and cold storage capacity.

The Commonwealth of Dominica has formulated a national development plan called the *Third Medium-Term Growth and Social Protection Strategy 2012 -2014*. Within this strategy, the fisheries sector is poised for expansion because of efforts to improve the basic fisheries infrastructure through the development of seven zonal centers and to create a fishery management system by way of establishing a legal framework. Furthermore, a 25-year long-term development plan for the fisheries sector called *A Fisheries and Aquaculture Policy for the Commonwealth of Dominica 2012 - 2037*, which is drafted in 2012, lists four long-term objectives - (1) Sustainable development and diversification, (2) Encouragement of sustainable fishing communities and lifestyles, (3) Sustainable resource management, and (4) Governance capacity-building and organizational development. In an effort to achieve the goals mentioned above, the Dominica Fisheries Division conducts regular Basic Fisherman

Training Courses (BFTC) to upgrade the knowledge and skills of fishermen, and it has formulated a draft of new Fisheries Regulations that include rules on FAD fishery management. Moreover, it is focusing efforts on the development of facilities management capacity for fishermen’s cooperatives to enable them to sustainably manage and maintain the existing fisheries complexes.

Amid this backdrop, JICA conducted a data collection survey during between November 2013 and February 2014 to confirm the situation surrounding the fishery industry in the nations of the Eastern Caribbean, assess the current state of the fishery facilities and equipment installed using Japanese grant aid, and examine the possibility of future cooperation in the fishery sector. As a result of these surveys, several needs, including upgrades to existing facilities and equipment and the installation of new facilities and equipment to respond to new issues related to change of fishing status and promotion of fishery management, have been confirmed.

The Government of the Commonwealth of Dominica requested Japanese grant aid for the following initiatives it has deemed as highly urgent: the upgrading of refrigeration equipment at the two fisheries complexes, the installation of two submerged-type FADs, the installation of a surveillance radar and VHF radio system, and the adoption of a multipurpose boat.

3. Outline of Survey Result and Project Scope

In response to this request, JICA sent a preparatory survey team to the country as outlined below, in order to formulate the project for upgrading and new introduction of fishery related machinery and equipment which are urgently required, examine its appropriateness and necessity, and prepare outline design, considering the result of a data collection survey conducted previously.

- 1st field survey: July 21 - August 31, 2014
- 2nd field survey (in-country explanations): November 24 - December 10, 2014

We conducted these field surveys and analyzed the situation in the country to assess the following: the background and content of the project, natural conditions, management and maintenance frameworks, construction conditions, and the materials procurement situation. As a result, this project was found to link closely with the upper level plans of the Government of the Commonwealth of Dominica, and it was confirmed to be necessary for the promotion of the development of the fishery sector. As for the scope of cooperation for this project, it was determined that the upgrading of refrigeration equipment and the installation of two submerged-type FADs were appropriate undertakings, and the preliminary project design was drafted as follows.

Category	Site	Primary equipment	Quantity
Refrigeration facilities	Roseau	Refrigeration equipment for cold storage (70m ³ , -17°C)	1 set
		Cooling tower and circulation pump	3
		Insulated truck (2 tons)	1
	Marigot	Refrigeration equipment for cold storage (40m ³ , -12°C)	1 set
Submerged-type fish aggregating device	Atlantic Ocean side	Submerged-type FAD (Depth: 1,300m)	1
	Caribbean Sea side	Submerged-type FAD (Depth: 2,300m)	1

4. Project Period and Appropriate Cost

The project will require five months for the implementation design and 11 months for procurement of equipment and machinery. Costs to be borne by the Government of the Commonwealth of Dominica is estimated EC\$18,000 (approx. 0.7 million yen).

5. Project Evaluation

(1) Appropriateness

The *Third Medium-Term Growth and Social Protection Strategy 2012 -2014*, the country's national development plan gave the infrastructure development as one of development objectives of fishery sector, while *A Fisheries and Aquaculture Policy for the Commonwealth of Dominica 2012 - 2037*, the country's 25-year fishery plan gave sustainable resource management. The Project will contribute to realization of efficient fish distribution through the improvement of functions of fish distribution facilities (infrastructure), which were introduced by Japan's past grant aid cooperation, as well as to promotion of fisheries management through introduction of submerged-type fish aggregating devices (FAD), in conformity with the objectives set forth in the above national plan.

The Japan's Country Assistance Policy for the Commonwealth of Dominica adopts "fishery" as one of the important sectors, and states that "the cooperation for sustainable development and management of fisheries is extended". In addition, the Japan's Rolling Plan for the Commonwealth of Dominica adopts "support to sustainable development of fishery" as a development issue and "programme for support to development of fisheries and fishing community" as a cooperation programme. In this context, the Project, which will contribute to sustainable development of fisheries, is conformed to Japan's policy of 'Official Development Assistance' (ODA).

Furthermore, the Commonwealth of Dominica has an important cooperative relation with Japan in fishery sector, so that the implementation of the Project is deemed as appropriate.

(2) Effectiveness

By the implementation of the Project, the following quantitative and qualitative effects are expected in the points of the improvement of fish distribution and the promotion of fishery management.

The following is a list of the anticipated quantitative effects:

Indicator	Baseline (2014)	Target (2019)
a) Purchases of fishery products by Newtown Fishermen's Cooperatives (NFC)	39.3t	40t
b) Total number of fishing boats entered to the submerged-type FADs per annum	0	1,600 vessels
c) Annual operating days of an insulated truck	0	120 days

The following is a list of the anticipated qualitative effects of this project.

- Improved freshness of fishery products and consumer satisfaction therewith due to upgrades to refrigeration facilities (as revealed by interview surveys).
- Spread of and enhanced understanding of managed fishery among fishermen due to the installation of submerged-type FADs (as revealed by interview surveys).

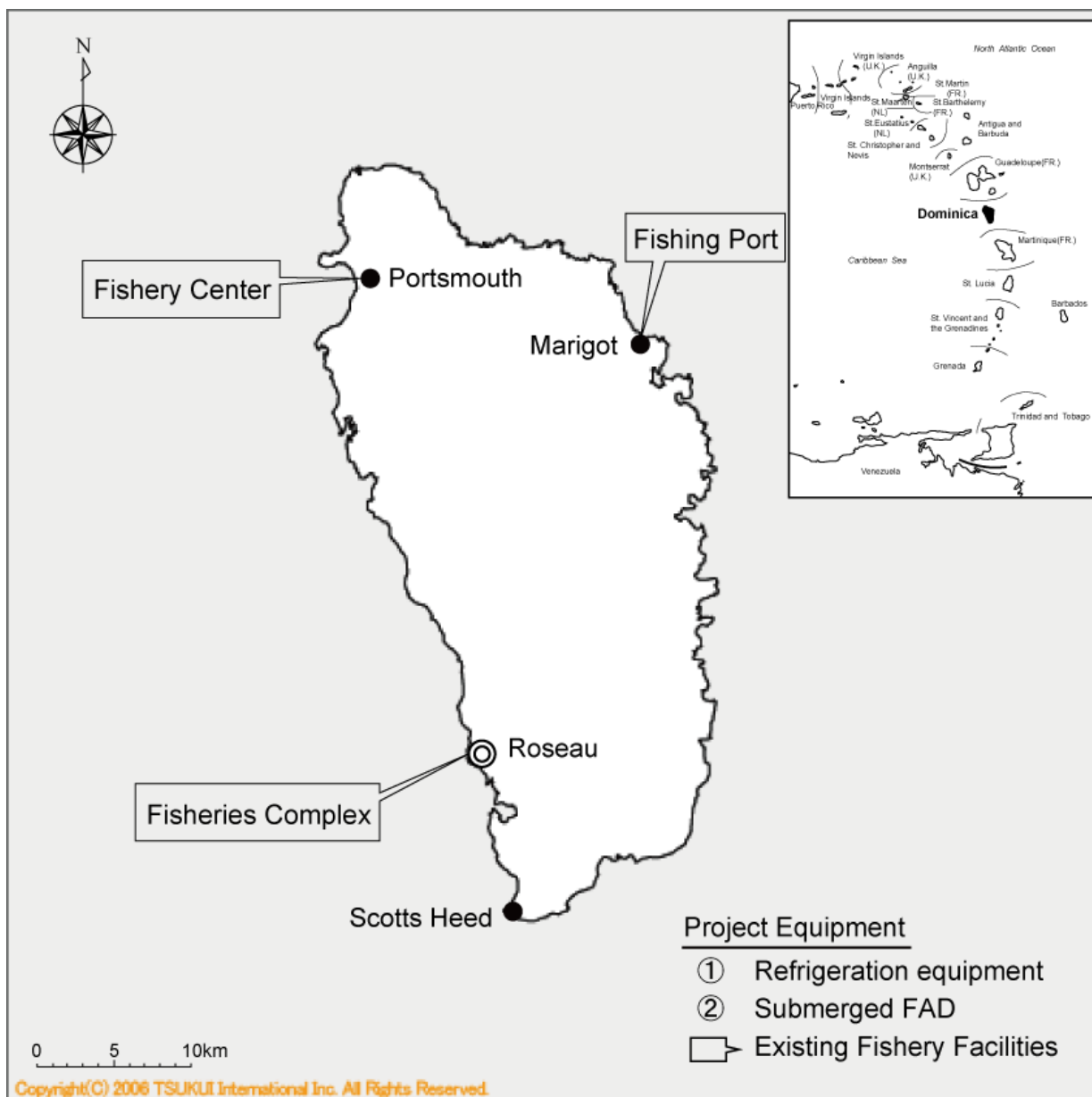
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ABBREVIATIONS

ABS	Acrylonitrile, Butadiene, Styrene
AIS	Automatic Identification System
BFTC	Basic Fisheries Training Course
CARIFICO	Caribbean Fisheries Co-Management Project
EC\$	Eastern Caribbean dollars
FAD	Fish Aggregating Device
FAO	Food and Agriculture Organization
FRP	Fiber Reinforced Plastics
GNI	Gross National Income
HCFC	Hydro-chloro Fluoro-carbon
Lb.	Libra (pounds)
MAGDELESA	Moored Fish Aggregating Device in the Lesser Antilles
NAFCOOP	National Fishermen's Cooperatives Association - Dominica
NFC	Newtown Fishermen Cooperative – Dominica
SUS	Stainless Steel
VHF	Very High Frequency

Chapter 1: Background of the Project

Japan has contributed to the development of the recipient country's fishery industry with grant aid projects and technical cooperation, but due to movements of fishing grounds due to marine phenomena believed to be caused by recent changes in climate change, damage and deterioration of fishery facilities from hurricanes (e.g., Ivan in 2004 and Earl in 2010) and other natural disasters, and the increase in fuel and other production costs, fish catches have plateaued, and it appears that some of the facilities that were built with Japanese grant aid are not being fully utilized. Amid this backdrop, JICA conducted a data collection survey during between November 2013 and February 2014 to confirm the situation surrounding the fishery industry in the nations of the Eastern Caribbean, assess the current state of the fishery facilities and equipment installed using Japanese grant aid, and examine the possibility of future cooperation in the fishery sector.

As a result of these surveys, several needs, including upgrades to existing facilities and equipment and the installation of new facilities and equipment to respond to new issues related to change of fishing status and promotion of fishery management, have been confirmed.

In response to the request made by the Government of the Commonwealth of Dominica, JICA implemented this preparatory survey to formulate the project relating to upgrading and new introduction of the equipment deemed especially urgent, to examine its appropriateness and necessity, and to prepare the outline design for this project, taking into consideration of the cooperation needs confirmed by the data collection survey.

Chapter 2: Contents of the Project

2-1. Basic Concept of the Project

2-1-1. Ultimate Objective and Project Objectives

In Dominica, fisheries facilities have been developed in three locations (Roseau, Marigot, and Portsmouth) through past grant aid projects. Although these facilities have been used effectively to improve the distribution of fishery products in the country, cases of aging in some of the larger equipment, such as ice-making and refrigeration equipment, have become apparent. As a result, storage and distribution of fresh fish are being restricted in some regions by insufficient ice and cold storage capacity.

Because the island's precipitous topography gives Dominica only a small area of shallow sea along its coastline, its fishery has developed primarily around pelagic fish. Since the 1990s, the country has installed fish aggregating devices (FAD) for the purpose of forming offshore fishing grounds. Although Dominica has more FADs than any other eastern Caribbean country, the precise number of FADs there is unknown. Looking to ensure the sustainable use of pelagic fishery resources, the Government of Dominica is attempting to shift to managed fishery by establishing laws governing the management of FADs. However, the offshore fishery environment is unstable and a number of related issues must be tackled, among them the development of little-used resources and supervision of illegal fishery.

The Government of the Commonwealth of Dominica has formulated a national development plan called the *Third Medium-Term Growth and Social Protection Strategy 2012 -2014*. Within this strategy, the fisheries sector is poised for expansion because of efforts to improve the basic fisheries infrastructure through the development of seven zonal centers and to create a fishery management system by way of establishing a legal framework. Furthermore, a 25-year long-term development plan for the fisheries sector called *A Fisheries and Aquaculture Policy for the Commonwealth of Dominica 2012 - 2037*, which is drafted in 2012, lists four long-term objectives - (1) Sustainable development and diversification, (2) Encouragement of sustainable fishing communities and lifestyles, (3) Sustainable resource management, and (4) Governance capacity-building and organizational development.

In an effort to achieve the goals mentioned above, the Dominica Fisheries Division conducts regular Basic Fisherman Training Courses (BFTC) to upgrade the knowledge and skills of fishermen, and it has formulated a draft of new Fisheries Regulations that include rules on FAD fishery management. Moreover, it is focusing efforts on the development of facilities management capacity for fishermen's cooperatives to enable them to sustainably manage and maintain the existing fisheries complexes.

The aim of this project is two-fold: 1) to improve the distribution of fishery products by upgrading the two fisheries complexes, and 2) to improve fishery management by creating offshore fishing grounds and ensuring that fishing operations comply with the regulations.

2-1-2. Project Overview

To achieve the objectives outlined above, this project calls for the upgrading of refrigeration equipment at the two fisheries complexes and the installation of two submerged-type FADs as well as the appropriate operation and

maintenance of these elements. The scope of cooperation will be the upgrading of refrigeration equipment and the installation of submerged-type fish aggregating devices (FAD).

2-1-3. Project Details

The equipment requested by the Government of the Commonwealth of Dominica is listed in the following table.

Table 1: Equipment requested by the Government of the Commonwealth of Dominica

Equipment requested	Remarks
a) Replacement refrigeration facilities	
1) Switching of refrigerants (R-22→R-404A) (Roseau, Marigot)	Recipient government intention based on international agreements.
2) Conversion of quick freezers into cold storage (Roseau)	Conversion of existing equipment
3) Insulated truck (500 kg x 1) (Roseau)	Upgrade existing equipment
4) Refrigeration equipment for cold storage (Marigot)	Same as above
b) Replacement water supply facilities	
1) Reservoir tank (36m ³ , including pump and pipes) (Roseau)	Not necessary since the recipient government converted the system to draw water directly from the tap water supply.
2) Water supply system (Marigot)	Not necessary since the recipient government plans to convert the system to draw water directly from the tap water supply.
c) Surveillance radar system (Control center x 1, radar sites x 3, AIS transponders x 300)	
d) VHF radio system (VHF radio repeater x 1, VHF radio stations x 2)	
e) Submerged-type fish aggregating devices (x 2)	Bring in new equipment
f) Multipurpose boat (x 1)	Same as above
g) Locally procured FAD materials (anchors, ropes and brackets for 10 FADs)	Same as above
h) Fishery data processing system (server x 1, computers x 2)	Not necessary since it is planned to be introduced as part of CARIFICO.
i) Repair tools (special tools for repairing four-stroke outboard engines)	Bring in new equipment
	Same as above

2-1-3-1. Upgrade of Existing Equipment and Machinery

In Dominica, fisheries facilities have been developed in three locations (Roseau, Marigot, and Portsmouth) through past grant aid projects. Although these facilities have been used effectively to improve the distribution of fishery products in the country, cases of aging in some of the larger equipment, such as ice-making and refrigeration equipment, have become apparent. As a result, storage and distribution of fresh fish are being restricted in some regions by insufficient ice and cold storage capacity. By restoring existing equipment and machinery to its initial capacity and converting equipment in light of current needs, this project strives to improve fishery product distribution and stabilize fishery management.

(1) Refrigeration facilities

Replacement of R-22 refrigerant in refrigeration equipment with R-404A

In line with national policy, the decision was made to replace the refrigerant R-22 with R-404A or ammonia. This move was established in law in 2013. The “HCFC Management Plan (August 2010)” that was prepared by Dominica’s Environmental Coordinating Unit (ECU) sets as targets a 10% reduction in R-22 use by 2015 and 35% reduction by 2020. It also plans for the gradual phasing out of R-22 through use of a refrigerant import quota system, with the aim of complete elimination by 2030. Given the difficulty of handling ammonia and the fact that it is not widely used in Dominica, the Fisheries Division is requesting that R-22 be replaced with R-404A based on consideration of cost and operational aspects. However, the Fisheries Division is concerned about rising electricity costs that could result from the switch in refrigerant. It therefore intends to continue using R-22 in

ice-making and cold-storage facilities in Roseau, which do not require physical upgrade.

a) Roseau Fisheries Complex (Coastal Fisheries Development Project, completed 1997/2002)

Between 12 and 17 years have passed since these facilities, which are managed and operated by the Fishermen's Cooperatives and the Fisheries Division, were completed. Twelve years have passed since the completion of all refrigeration equipment, and therefore the time for equipment upgrade is approaching.

Table 2: Status of existing equipment and machinery at Roseau Fisheries Complex

Component	Physical condition	Status of use	Status of operation and maintenance	Remarks
i) Condensing units (4 units)	Three of the 4 units are operating. One of the cooling towers has been disassembled to acquire parts.	Used as part of refrigeration equipment for existing ice plants and cold storage	Operation of ice plants, cold storage, and insulated trucks are entrusted (leased) to the Newtown Fishermen's Cooperative (NFC). Equipment maintenance is handled by the Fisheries Division. When necessary, machinery repairs are outsourced to a private company.	Heat exchangers in the ice plants and cold storage is indispensable.
ii) Cooling towers (4 units)				
iii) Conversion of quick freezers (2.5 tons) into cold storage	No problem	Completely unused due to high electricity cost compared to cold storage. Tuna and other such fish are not eaten raw, and therefore quick freezing is not required.		Existing cold storage is being used at close to full capacity. Therefore, utilization will further increase by converting freezers into cold storage.
iv) Insulated truck (500 kg x 1 truck)	Two 1-ton trucks and two 2-ton trucks were provided through previous grant aid (1997). The one 1-ton truck that is currently operating is very old.	Used to transport ice to Marigot, etc., and collect fishery products from landing areas.		The existing vehicle is being used to collect fishery products from rural fishing villages and distribute ice. Additionally, as activities to popularize fish eating campaign, vehicles will be also needed to supply fishery products inland in the future.
v) Ice plants (2.5 tons x 4 units)	No problem	In October, the peak month of 2013, a daily average of 10,253lb (4,645kg) of ice was sold. (This increased to 6,636kg when the ice sold by NFC for in-house consumption is included.)		
vi) Refrigeration equipment for cold storage (-20°C ; approx. 70 m ³ x 2 units)	See above	Existing cold storage units have daily arrivals and shipments of fishery products and are running at close to capacity.		

b) Marigot Fishing Port (Project for Construction of Marigot Fishing Port; completed in 2004)

Ten years have passed since this facility, which is managed and operated by the Fishermen's Cooperatives and the Fisheries Division, was complete. The installation of an ice plant (2 tons/day) through follow-up cooperation has been approved.

Table 3: Status of existing equipment and machinery at Marigot Fishing Port

Component	Physical condition	Status of use	Status of operation and maintenance	Remarks
i) Refrigeration equipment for cold storage (-20°C; approx. 40 m ³) (1	Cold storage temperature is not sufficiently cold due to aging equipment. The cold storage floor is frozen/has	Fishery products are brought in/shipped out frequently each day.	Leased to the local fishermen's cooperative. Maintenance is handled by the Fisheries Division.	The current cold storage will continue to be utilized, making upgrade necessary.

condensing unit, 1 cooling tower)	buildup due to frozen drains.			
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(2) Water-supply facilities

With annual precipitation of 4,000 mm, Dominica has abundant water resources. Water is supplied without problem in almost all regions of the country. Moreover, water pressure for this supply is maintained so that it arrives in Roseau and Marigot at 0.4 MPa. In the initial design, a system was used whereby water was temporarily stored in receiving tanks and then pumped up to elevated tanks. From there it was distributed by gravity to each location. However, with the passage of time, pump malfunctions and leaks in elevated tanks have occurred frequently. The Fisheries Division is responding by switching to a direct-supply method that does not involve transmitting water through receiving tanks and elevated tanks.

2-1-3-2. Equipment and Machinery envisioned for New Installation

Because the island's precipitous topography gives Dominica only a small area of shallow sea along its coastline, its fishery has developed primarily around pelagic fish. Since the 1990s, the country has installed fish aggregating devices (FAD) for the purpose of forming offshore fishing grounds. Although Dominica has more FADs than any other eastern Caribbean country, the precise number of FADs there is unknown. Looking to ensure the sustainable use of pelagic fishery resources, the Government of the Commonwealth of Dominica is attempting to shift to managed fishery by establishing laws governing the management of FADs. However, the offshore fishery environment is unstable and a number of related issues must be tackled, among them the development of little-used resources and supervision of illegal fishery. Bringing in the new machinery listed below and effectively utilizing it is expected to strengthen the fishery management system of Dominica.

(1) Surveillance radar system

Although laws and action plans for the control of illegal fishing boats have yet to be drawn up, preparations are underway toward the development of laws based on the Castries Declaration of the Caribbean Regional Fisheries Mechanism (CRFM). Dominica takes the problem of illegal fishing boats seriously. The numbers of illegal fishing boat seizures by the Coast Guard during the past five years are as shown below. Moreover, it has been reported that 17 boats are stacked up onshore at the Coast Guard's Roseau base, and that those boats will not be released until fines are paid.

Table 4: Numbers of illegal fishing boats seized by the Dominican Coast Guard

Year	Foreign fishing boats		Dominican fishing boats	
	No. of seized boats	Illegal activities	No. of seized boats	Illegal activities
2009	3 (French registry)	Illegal operation, violation of order to suspend operation, acts of violence	—	-
2012	2 (French registry)		—	-
2013	3 (French registry)		1 (<i>Blue Royal</i>)	Operating without a license

In case that this system is introduced, it will not only allow the Coast Guard to reduce operating expenses for its patrol vessels, it is expected to rein in illegal fishing by unlicensed fishing vessels, thereby ensuring the proper management of marine resources. It will also enable the Fisheries Division to collect and analyze data on domestic fishing vessel operations (e.g., fish catch volumes around the FADs) that could potentially be used in the formulation of future Fishery Management Plans.

a) Monitored waters and radar sites

The radar sites were examined from existing telecommunication tower sites and existing fishery complex sites with the conditions that they were government property and therefore available for use and would allow surveillance over as broad an area as possible. Three sites were selected: 1) Marigot Fishing Port, 2) the top of Morne Espagnol (on the outskirts of Portsmouth), and 3) Fond St. Jean. The priority targets of surveillance will be illegal foreign fishing boats and fishing boats around FADs. It should be noted that the total number of fishing boats operating in Dominica is 343, of which 224 are keel boats and 119 are fiber-reinforced plastic (FRP) boats. The surveillance areas (radar wave reach distance) covered by each radar site are as shown in the figure below.

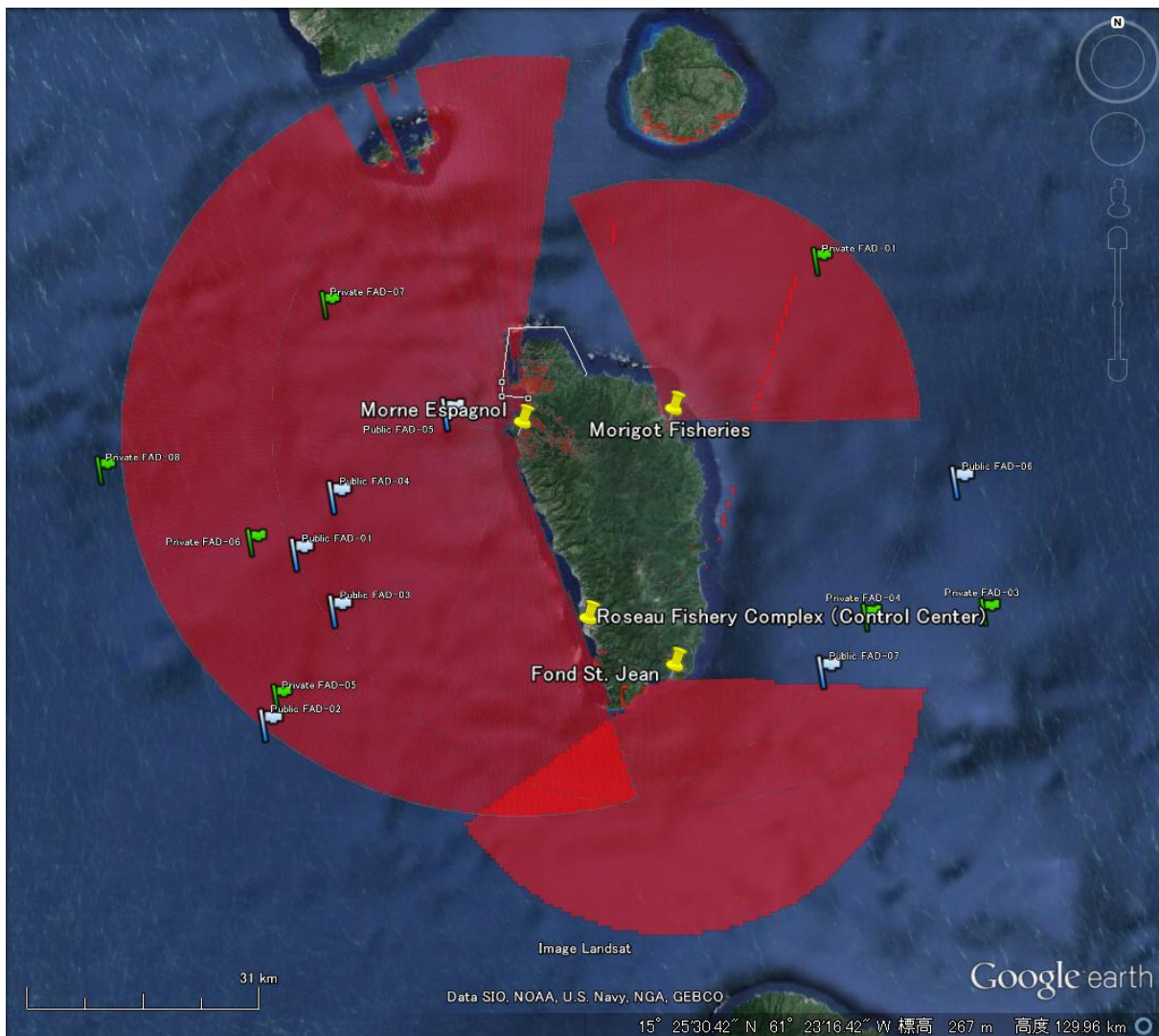


Figure 1: Areas that can be monitored by radar (based on simulation)

b) Operation and maintenance framework

In Dominica, the responsibility for monitoring illegal fishery belongs to the Fisheries Division, while that for surveillance and control of all vessels engaged in illegal activity (including fishing boats) and sea rescue falls to the Coast Guard (an arm of the Dominican police). The Coast Guard possesses five small patrol boats (30 to 40 feet), of which one is ordinarily patrolling on the sea.

Both organizations were positive to a framework in which both will operate the radar system in partnership. Specifically, the Fisheries Division will aggregate data on daily numbers of fishing boats entering the area around each FAD, the lengths of time they stay there, and the directions they take when entering and leaving for fishery management around FADs. It will build a system for the automatic aggregation of data by personal computers. On the other hand, the Coast Guard will conduct radar surveillance on a 24-hour basis (three shifts per day). If any suspicious vessels are detected, it will dispatch a patrol boat to confirm the identity of the vessel and enforce regulations. If the Fisheries Division discovers a vessel that it thinks may be an illegal fishing boat, it will notify the Coast Guard of its position and request the dispatch of a patrol boat. The main monitoring room will be set up in the Fisheries Division. Images received by the room will also be viewable in real time on personal computers of the Coast Guard. In addition, as the radar system is installed, the Fisheries Division will implement new training on portable automatic identification system (AIS) terminals and make additions to fishery regulations that will require boats to always carry those terminals when they are fishing. It is also explaining the system to fishermen through stakeholders' meetings held during this survey and confirming their general consent. It is anticipated that the operational and maintenance cost of the system will be approximately US\$1,000/month (US\$300 x 3 sites). Currently, the Coast Guard consumes between 1,000 and 3,000 gallons (US\$6,000 to \$18,000) of fuel per month. The system's coming into operation is expected to allow the Coast Guard to reduce the fuel costs of its patrol boats, and therefore a cost-sharing scheme with the Coast Guard is planned.

(2) VHF radio system

Although the number of fishing boats that currently possess VHF radios is limited, the use of handheld VHF radios is being promoted under the Basic Fishermen Training Course (BFTC). To expand this effort throughout the country, it will be essential to establish a VHF radio network. The Fisheries Division is providing training on VHF radio operation as part of BFTC, and there is a framework in place whereby fishermen who complete this training can obtain a radio operator's license from the National Telecommunications Regulatory Commission (NTRC). During the past three years, 60 fishermen have completed training. However, it is unknown how many of them have actually installed VHF radios.

Looking at VHF radio stations, a radio and antenna is currently installed in the Roseau Fishery Complex. These items were provided without charge in 1997. Given this, two new stations will be built in Portsmouth and Marigot (specifically, antennas will be installed on radar towers to expand the communications area as much as possible). Additionally, an unmanned remote-control radio station will be set up on a radar tower that is scheduled for construction in Fond St. Jean. As for the links between stations, a network using Internet connections will be built due to topographical considerations that make installing functional relay stations difficult. This network will make it possible to communicate via VHF radio in many of the ocean areas within 30 nautical miles of Dominica's coast. The result will be greater operational efficiency based on information-sharing among vessels at sea and better fishing boat safety.

(3) Submerged-type fish aggregating devices

Many of the floating-type FADs that were installed by fishermen have been lost to the sea and repeatedly replaced. The Fisheries Division has also installed floating-type FADs with assistance from JICA and aid organizations in France and other countries; however, many have been lost within a short period of time due to the

effects of hurricanes and high waves and cutting by vessels. Given these circumstances, employees of the Fisheries Division who received training through JICA's technical cooperation are requesting the introduction of submerged-type FADs. Submerged-type FADs are resistant to the effects of the ocean waves and have a structure that is not damaged by passing vessels. These characteristics give them long-term durability and make them effective in attracting fish. In Japan, these FADs have been used for many years and their effectiveness is recognized. It is expected that submerged-type FADs will contribute to improve conditions there and as part of fishery management (creation of permanent fishing ground, stabilization of catch volume, and saving of operation cost of fishing boat).

a) Existing fish aggregating devices (FAD)

In Dominica, private sector-led installation of FADs began earlier than other eastern Caribbean countries (in the 1990s). Currently, at least 20 FADs have been installed. Many of the FADs were installed without notification to the Fisheries Division, and therefore the total number of FADs that exist is unknown. According to interviews that were conducted, there are currently 11 FADs near Marigot, at least 11 near Roseau, and at least five near Portsmouth. On the other hand, there are seven official FADs that have been installed under government leadership since 2011 (four by the Fisheries Division, two by MAGDELESA, and one by JICA); however, at the current time, all have been washed away except for one that was installed by MAGDELESA. The management framework for the official FADs is vague, and therefore fishermen have little awareness that the FADs are theirs, and as a result they do not maintain them. Moreover, because the locations of the FADs are publicly announced, there is a feeling among fisherman that they are being monitored.

According to data possessed by the Fisheries Division, a total of 178 fishing boats engaged in FAD fishery during 2013. These boats conducted operations a total of 1,741 times during the year and caught 263,144 lbs (approximately 119 tons) of fish (37.4% of the entire catch).

b) Installation plan

During a stakeholders' meeting held during this survey, a request was made for the installation of one submerged-type FAD each on the Atlantic Ocean side (20 nautical miles east of the Marigot coast) and Caribbean Sea side (20 nautical miles west of the central west coast). Although locations cannot be set with consideration for existing FADs because information on the locations of private-sector FADs is unavailable at the present time, it is examined to install FADs in two locations—one 20 nautical miles east of Marigot on the Atlantic Ocean side and one 20 nautical miles west of Salisbury, which is situated on the central west coast, on the Caribbean Sea side—with the condition that fishermen from all regions can have access to them.

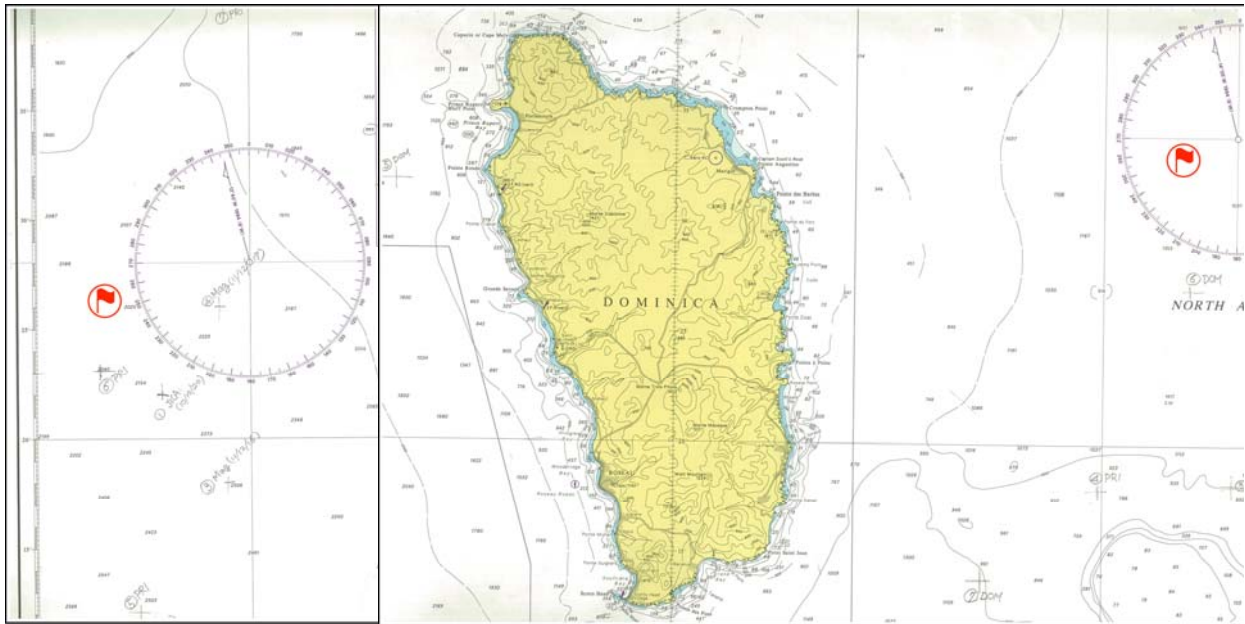


Figure 2: Planned installation sites for the submerged-type FADs

Submerged-type FADs are not affected by the passage of large vessels or hurricanes and can last more than 10 years. Therefore, their introduction will contribute to greater stability in offshore pelagic fishing as part of fishery management.

c) Operation and maintenance framework

The Fisheries Division formulated “fisheries regulations (revised draft)” and “regulations on FAD fishery (draft)” in 2013 for the purpose of establishing a management framework for FAD fishery that is based on the promotion of co-management between the government and fishermen that is moving forward under CARIFICO. These drafts were submitted to the House of Assembly in July 2013 but did not receive approval (notation in a government gazette). These regulations clearly state that all FAD fishermen who engage in fishery using FADs must obtain a special license, and that all FADs will be placed under the management of the National Association for Fishermen’s Cooperatives (NAFCOOP). According to the Minister, the procedures will be continued toward approval of the regulations and their establishment as law before the completion of the project implementation. With the enactment of these regulations, a management framework for public FADs was clarified and all existing private FADs were outlawed. At the stakeholders’ meetings held during this survey as well, attended fishermen have promised, under the guidance of the Fisheries Division, to comply with the laws once they are put in place.

(4) Multipurpose boat

The introduction of a multipurpose boat will enable the Fisheries Division to conduct at-sea fisherman training, implement various fish catch experiments, and safely and efficiently install and monitor FADs. It is also expected to improve the quality of fishing activities required for the shift to managed fishery.

a) Operational status of existing boats

The Fisheries Division currently owns one small boat named *Iida* (30-foot 100-hp inboard engine boat). At the present time, the Basic Fisherman Training Course borrows Coast Guard vessels and fishing boats for training purposes, and this does not appear to present any problems. Existing fishing boats are also utilized in the same way to install FADs.

Boat operations for the period of 2011 to 2014 are as shown below.

Table 5: Status of boats owned by the Dominica Fisheries Division

Purpose	Details	Frequency of operation
Trial operation for diamond back squid (DBS)	DBS fishing ground survey (fishing ground & depth); water quality survey using portable CTD; recording of caught DBS weight, mantle length, sex, etc. (together with trial processing and cooking of DBS, presentation of recipes and advertising, and opening of sales avenues for processed products)	2011 – 2012 (once weekly) 2013 (continuing with decreasing frequency compared to the previous year)
Installation of FADs as a NAFSCOOP project	Installation and monitoring of 4 FADs	August 2011 and 2012
FAD project by MAGDELESA	Support of installation work by a FAD installation boat readied by MAGDELESA and post-installation maintenance and monitoring	December 2012
SSMR DAY (Soufriere Scotts Head Marine Reserve Day)	Actual boat boardings and tour of the Soufriere Scotts Head Marine Reserve as part of marine activities and environmental education for primary school children	June 2011 June 2012 June 2013
Other	Cooperation with TV filming of fishery activity; DBS fishing See above (NHK); DBS and FAD fishery	March 2014 June 6-8, 2014

b) Operating plan for the new boat

The multipurpose boat is planned for use in BFTC special courses (radio, safe navigation), trial operations for DBS and ruby snapper, and FAD monitoring (fishing tests, survey of fish concentration conditions, water temperature survey, etc.). A prerequisite is that the operation of the multipurpose boat must be self-sustaining. It should be mentioned that the existing boat covers its expenses for fuel and other items with sales of its catches, and therefore it operates in a self-sustaining manner.

The operating plan and income/expenditure plan are as follows.

Table 6: Operating plan of Multipurpose Boat

Purpose	Number of Operation days			OPERATION SCHEDULE											
	Days/ time	Times /year	Total	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1. Training of fishermen on board (BFTC Special course) 1) Radio communications 2) Safety/Navigation 3) Fishing	4	4	16 days	BFTC			BFTC				BFTC			BFTC	
2. Experimental fishing for Dimond Back Squid	1	40	40 days	DBS											DBS
3. Experimental fishing on deep slopes (vertical long line)	2	6	12 days		VLL										
4. Installation of FAD and Monitoring															
- for installation	2	10	20 days												
- for monitoring/fishing	3	12	36 days												
Total number of operation days			124 days												

In case that the new boat comes into service, plans call for the existing boat to be leased to a fishermen's cooperative or individual fisherman.

Table 7: Operating Income/Expenditure Plan of Multipurpose Boat

	Sales (EC\$)	Expenditure (EC\$)	Income (EC\$)	Remarks
a) Fishermen's training at sea	7,920	8,902	- 982	DBS, ruby snapper, tuna: 210 lbs/voyage x 4 voyages/year
b) Trial operation				
1) DBS fishing	31,200	17,066	14,134	DBS: 60 lbs/voyage x 40 voyages/year (@EC\$13/lb)
2) Longline fishing	9,000	8,096	903	Ruby snapper: 150 lbs/voyage x 6 voyages/year (@EC\$10/lb)
c) FAD installation				
FAD installation	-	5,691	- 5,691	No catches
FAD monitoring	4,900	5,536	- 636	Tuna: 100 lbs/voyage x 7 voyages/year (Caribbean Sea) (@EC\$7/lb)
	7,000	7,961	- 961	Tuna: 200 lbs/voyage x 5 voyages/year (Atlantic Ocean) (@EC\$7/lb)
Total	60,020	53,252	6,768	Income to be allocated to maintenance and management expense

Remarks: The operational cost includes (the cost of purchasing fuel, ice, bait, and fishing equipment (personnel costs are not included).

c) Operation and maintenance framework

The plan is to employ a fisherman (Mr. Popo) who has helped out in operation of the existing boat on a part-time basis as the boat operator of the multipurpose boat. The plan also calls for the selection of one of the three current mechanics of the Fisheries Division for assignment as a full-time maintenance worker. It should be noted that operational expenses (fuel cost) for the multipurpose boat will be covered by sales of fish catches obtained through the boat's operation.

(5) Materials for building FADs

Floating-type FADs of various specifications are being introduced by the Fisheries Division, MAGDELESA, JICA, and the private sector (fishermen's groups and individuals). Within the CARIFICO project that is currently underway, there is a plan to introduce 30 FADs of an improved design (10 FADs/year x 3 years).

(6) Fishery data processing system

At the present time, there are six PCs in the Fisheries Division, of which one is used as a virtual server. However, given that data cannot be shared among the three Fishery Complexes, a Fisheries Division website cannot be set up on the existing system, and information cannot be shared with the Coast Guard, it is thought that a server capable of handling networked sharing will need to be installed in the Fisheries Division. Moreover, of the three existing complexes, Portsmouth does not have a PC, and therefore there is a plan to move two older PC models (for data entry and secretarial work) that exist in the Fisheries Division to Portsmouth and then to install two new PCs in the Fisheries Division.

In case that this system is introduced, fishery data processing will be accelerated (It takes normally 3 to 4 months without this system. It will be accelerated to 1 month with this system). It will also lead to lower fuel costs, as raw data from regional landing sites, which data collectors now transport by car once monthly, will become transferable by computer.

(7) Repair tools

The introduction of four-stroke outboard engines is progressing under the current technical cooperation project CARIFICO. The project is also providing support by transferring outboard engine repair skills. Dominica also

plans to promote the use of four-stroke engines in expectation that they will reduce fuel costs. At the present time, there are 33 fishing boats using four-stroke outboard engines (three types: 50, 75, and 100 horsepower) in Dominica (5 in Marigot, 4 in Roseau, 3 in Fond Cole, 1 in Anse de Mai, 2 in Layou, 4 in Scotts Head, 3 in Stowe, 6 in Portsmouth, 3 in Du Blanc, and 2 in San Sauveur). However, repairing the existing four-stroke engines presents a difficult challenge due to a lack of the special tools needed to repair them. Because workshops currently exist in Roseau and Marigot, two sets of special tools are examined.

In case that these repair tools are introduced, it will make easy to maintain and repair four-stroke engines, which will lead to their greater popularity. And by extension, the use of these engines should bring benefits in terms of economic considerations (lower fuel costs) and the global economy (lower CO₂ emissions), enhance fishermen's understanding of management-based fishery, and make it easier to gain their cooperation in such fishery.

It must be noted, however, that Yamaha Motor Co., Ltd., an outboard engine manufacturer that does the most business in four-stroke engines in the Caribbean, has two agencies (Caribbean Marine Co., Ltd. and Auto Trade Co. Ltd.) in Dominica, and it has been confirmed that Yamaha plans to unify a local agent into Auto Trade Co., Ltd. to improve its repair service framework through its agency. At the same time, given that the Fisheries Division and Caribbean Marine Co., Ltd. have been undertaking engine repair services for fishermen in Dominica, Yamaha plans to provide the repair parts and repair tools to the Fisheries Agency and Caribbean Marine through Auto Trade. In other words, all major repairs for four-stroke engines are concentrated in the local agency, and routine inspections and general repairs are handled by the Fisheries Division and Caribbean Marine.

2-2. Outline Design of the Japanese Assistance

2-2-1. Design Policy

(1) Refrigeration facilities

Basic policy

The refrigerant used in the oldest refrigeration facility in Dominica, namely, Roseau Fishery Complex, is R-22. However, as there are no physical problems with the existing facility, R-22 will continue to be used. On the other hand, considering the situations that the existing quick freezer has higher electricity costs than the cold storage and the existing cold storages are almost full in use, the existing quick freezer will be converted into cold storage based on a request from the Dominican side. The cold storage equipment using a refrigerant R-22 in Marigot Fishing Port has deteriorated with age and must be upgraded, and therefore it will be replaced with equipment that uses R404-A.

The existing water-cooled condensation method will be used in both Roseau and Marigot.

Because R-404A has higher condensation pressure, compression power will rise by approximately 20% and the capacity of condenser motors and other equipment will similarly increase by approximately 20%. As a result, initial costs will increase due to changes in wiring, as will power consumption. However, the existing motor capacity will be used for the purposes of this project. While this will result in lower cooling capability, it will not be a problem in terms of the required demand or fish catch quality.

Design policy

1) The size, capacity and specifications of the refrigeration facilities will be rational in light of user intentions,

catch volume over time and other factors.

- 2) Equipment will not be replaced solely for the purpose of changing refrigerant.
- 3) Existing ice storage and cold storage structures (in all cases, installed by assembling prefabricated heat-insulating panels) will be used.
- 4) The island of Dominica has abundant water resources throughout the year, and therefore there is no risk of water stoppages. All refrigeration facilities that were installed with grant aid use water in their condensation systems, and this method will be continued for the project.
- 5) Work will center on equipment replacement, and therefore no permits or approvals (including for construction, in particular) will be required. Wiring materials and other items that are paid for by local governments will be changed to handle increased power consumption arising from higher refrigeration capability.
- 6) There are two local companies that handle refrigeration equipment. However, both primarily deal with air-conditioning equipment and have almost no experience working with refrigeration facilities. Consequently, the Japanese equipment company will lead installation work and the local businesses will provide support.
- 7) In case of replacing a refrigerant of refrigeration facilities, a Freon-based R-404A will be selected taking into consideration of the intentions of the Government of the Commonwealth of Dominica.
- 8) In the selection of equipment and machinery, convenience for local users will be maintained by respecting the devices and systems of existing facilities for which local personnel have acquired sufficient maintenance skills and primarily using Japanese equipment that is similar to existing equipment.
- 9) Work schedules will be planned so as to minimize effects on the operation of existing facilities. Replacement work at the two sites will take place one site at a time, with care given to ensure that facility users are not inconvenienced.

(2) Water supply facilities

These do not need to be repaired or replaced under this project because Dominica has converted them on its own accord.

(3) Surveillance radar system

Although we fully recognize the need for a surveillance radar system, an ongoing careful examination of whether or not the radar system that would likely be installed will effectively function is necessary in light of the actual situation concerning illegal fishery in Dominica. As such, this system falls outside of the scope of cooperation.

(4) VHF radio system

In terms of the project objectives, since the VHF radio system must be brought online together with the surveillance radar system and since the number of Dominican fishing boats equipped with VHF radios at this point is limited, this system falls outside of the scope of cooperation.

(5) Submerged-type fish aggregating devices

Design guidelines

- 1) The ocean around Dominica has a deep-sea topography that plunges to depths of more than 2,000 meters within several nautical miles of the shore. It is also an area through which tropical storms and hurricanes pass. The submerged-type FADs that will be utilized will be designed for deep water and have the durability needed to withstand high waves during hurricanes. Moreover, they must be of a type that has been used in numerous locations in Okinawa - Japan, which has a marine and climatic environment similar to that around Dominica, and be recognized as having durability of at least 10 years.
- 2) The sites for submerged-type FAD installation will be in sea areas that are accessible from fishing villages. One FAD will be installed on the Caribbean Sea side and one will be installed on the Atlantic Ocean side, based on the request from the Dominican side.
- 3) Submerged-type FADs are devices and technologies that were developed in Japan. They will be procured from a manufacturing company in Japan that has many years of actual experience manufacturing and installing them.
- 4) To ensure the effectiveness and durability of the submerged-type FADs, experienced technicians will construct a model of an FAD that is frequently utilized in Japan and has demonstrated durability of at least 10 years using materials of the same quality.
- 5) Technicians from the company to manufacture the submerged-type FADs will prepare components in Dominica, conduct depth and sea-bottom topography surveys at the installation points, fix anchor ropes, guide installation work at the work sites, and check installation.

(6) Multipurpose boat

Necessity and appropriateness of the multipurpose boat are recognized. However, the plan to operate the boat based on a self-sustaining method is risky, as operation according to plan may not be possible if catch sales do not rise as anticipated. For the time being, the activities that are planned for the multipurpose boat should be carried out by effectively utilizing and maintaining the existing Fisheries Division boat (inboard diesel engine boat). Accordingly, the multipurpose boat will be excluded from this project.

(7) Materials for FADs

Materials for the fabrication of FADs will not be procured as part of this project.

(8) Fishery data processing system

We understand there is a need for this system, but it falls outside of the scope of cooperation because it is composed of small-scale, general-purpose equipment.

(9) Repair tools

The requested repair tools fall outside of the scope of this project. Since some of the basic tools that are scheduled to be procured as part of CARIFICO are the same as those special tools that the Fisheries Division needs, we have determined that these do not need to be procured under this project.

2-2-2. Basic Plan (Equipment Plan)

The following table lists the equipment that falls under the scope of cooperation for this project.

Table 8: Equipment that falls under the final scope of cooperation

Category	Site	Primary equipment	Quantity
Refrigeration facilities	Roseau	Refrigeration equipment for cold storage (40m ³ , ±0°C)	1 set
		Cooling tower and circulation pump	3
		Insulated truck (2 tons)	1
	Marogot	Refrigeration equipment for cold storage (40m ³ , ±0°C)	1 set
Submerged-type fish aggregating device	Atlantic Ocean side	Submerged-type FAD (Depth: 1,300m)	1
	Caribbean Sea side	Submerged-type FAD (Depth: 2,300m)	1

2-2-2-1. Refrigeration facilities

The common specifications of refrigeration facilities to be introduced through the project are as follows:

Refrigerant: R-404A

Disposal of old refrigerant: Disposal of old refrigerant will take place prior to replacement work. Transport of recovered refrigerant to the designated location will be included in the project.

Removal of existing equipment: As is the case for refrigerant, removal of existing refrigeration equipment will include transport to the designated location.

Design conditions (common items only)

External air temperature: +35°C

Water temperature: +28°C

Water quality: Tap water

Power source: AC 380 V x 50 Hz x 3 phs x 4 wires, AC 220 V x 50 Hz x 1 ph

Cooling method: R-404A direct expansion sensation method

Condensation method: Air cooling

1) Roseau Fisheries Complex

Conversion of the freezer into cold storage

The existing 2 units of cold storages are fully used having the cases of over capacity placing fishes on the walking space inside cold storage, while the existing quick freezer is not used due to high electricity cost. In accordance with a request from the Government of the Commonwealth of Dominica, chronic shortages of cold storage capacity will be eliminated by converting the freezer into cold storage. In consideration for local power supply conditions (i.e., sharply rising electric power charges), motor capacity will be kept as is in order to suppress rising power demand that will arise from the change in refrigerant. The existing refrigeration equipment for the freezer will be removed and refrigeration equipment for cold storage (one condensing unit, one defrosting pump, one cooling tower, and one coolant circulation pump) will be installed.

Ice-making facility

Ice is supplied from the Roseau ice-making facility (2.5 tons/day x 4 units) to catch landing sites in Marigot and

other regions. According to ice sales data of the Newtown Fishermen’s Cooperatives (NFC) for 2013, ice is sold at an average rate of 10,253 lbs (4,645 kg) per day during the peak period (October) (see the table below). In addition to this, when ice used for fishery product processing and sales by NFC is included (in-house consumption: approximately 30% of the total), the total reaches 6,636 kg per day. Moreover, when the effective operating rate of the ice-making equipment (80%) is considered, daily production comes to 8.3 tons, which means that existing equipment has appropriate ice-making capacity (10 tons/day). Given that an ice-making facility capable of producing two tons per day will be installed in Marigot through a follow-up project that is currently underway, the facility at Roseau should be able to meet ice demand even if its ice-making capacity diminishes somewhat due to age.

Table 9: Ice sales at the Roseau Fisheries Complex (2013)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
Sales amount (ECS)	8,722	13,893	9,098	8,930	11,024	9,638	10,924	11,205	10,143	18,310	12,081	11,985	135,953
Sales volume (lb)	122,114	194,508	127,371	125,024	154,336	134,936	152,940	156,863	141,999	256,333	169,131	167,787	1,903,340
Average volume per day (lb)	4,885	7,780	5,095	5,001	6,173	5,397	6,118	6,275	5,680	10,253	6,765	6,711	76,134
Remarks: ECS5/70lb (Selling price of ice)													

Cold storage

The existing cold storages (two units x 40 m³) are fully utilized by the Newtown Fishermen’s Cooperatives (NFC) daily. The purchase volume of fish by NFC during 2012 – 2013 was 38.5 – 40.1 tons (39.3 tons/year), of which the most are stored in the cold storages. The monthly volume of purchase shows that large quantities of fish are purchased during March – June and October – November, that are sold during July – September and December – February in low fishing season. Provided that same volume of fish is shipped out every month, it is estimated that the average holding period of fish in cold storage is 3 – 4 months with the holding volume of 5.67 tons in average and 11 tons in maximum. Since the actual shipping volume is irregular, cold storages are almost full and cannot hold any more fish in certain period. To mitigate such a situation, as mentioned in the above, the unused quick freezer will be converted to cold storage so as to increase the holding capacity of frozen fish. As for the existing cold storages, which does not suffer from any physical problems, will be able to continue to use.

Table 10: Monthly volume of fish purchase by Newtown Fishermen’s Cooperatives (Unit: kg)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
2012	0	343	4,972	5,614	5,242	5,377	65	2,079	3,466	3,786	5,878	3,273	40,096
2013	359	1,075	4,149	7,959	9,697	5,205	1,508	69	1,721	3,451	3,337	0	38,531
Average	179	709	4,561	6,787	7,470	5,291	786	1,074	2,593	3,619	4,608	1,636	39,313
Shipping volume	3,276	3,276	3,276	3,276	3,276	3,276	3,276	3,276	3,276	3,276	3,276	3,276	3,276
Holding volume	2,566	0	1,285	4,796	8,990	11,005	8,515	6,313	5,630	5,973	7,303	5,663	5,670

Source: Newtown Fishermen’s Cooperatives (NFC). Shipping and holding volumes are estimate of the Consultant.

Cooling towers

There are four existing cooling towers. However, one of the towers is disassembled and out of use, and the remaining three are showing age and may require replacement in a few years. Of the four existing cooling towers, one will be upgraded as a component of the “conversion of the freezer into cold storage” that was mentioned above. Accordingly, the remaining three cooling towers will have their parts exchanged (including their three coolant circulation pumps). Additionally, one defrosting pump for the existing cold storage (two units) will be

replaced.

Insulated truck

Although the insulated truck (1-ton x 1 truck) has been in service for 17 years, it continues to be used nearly every day to transport ice to Marigot and other outlying fishing villages and to collect catches. However, it must be replaced quickly, as it is very old over its serviceable life. Additionally, it is anticipated that the insulated truck will be used to transport fresh fish to inland destinations as the current “Eat Fish Campaign” produces results.

The insulated trucks supplied by a Japanese grant aid in 1997 were consisted of two 1-ton trucks and two 2-ton trucks, namely, 4 trucks (max. load capacity 6 tons) in total, aiming to transport fresh fish from rural fish landing sites to Roseau. The planned fish landing volume at that time (1996) was 2,775 tons/year, of which 763 tons were assumed to be transported to Roseau. On the other hand, the present fish landing volume (2013) is approx. 540 tons, and it is assumed that the fish collecting volume is 148 tons per annum (540 tons x 763/2,775), if fish is collected at same ratio. Therefore, the optimum scale of insulated truck to meet the current fish collecting volume is 1.16 tons (load capacity: 6 tons x 148/763).

Table 11: Summary of plan for refrigeration facilities (Roseau Fisheries Complex)

Equipment description	Existing equipment details (refrigerant: R-22)	Converted equipment details (refrigerant: R-404A)
Refrigeration equipment for cold storage (conversion of freezer into cold storage)	Daily freezing: 1.5 tons/day -25°C Conversion to cold storage due to disuse Use of open-type two-stage compressor, water-cooled condensation method	Conversion as cold storage (3) Capacity: 70 m ³ , temperature: approx. -17°C Use of open-type compressor, water-cooled condensation method
Cooling towers	3 cooling towers 3 coolant circulation pumps 1 defrosting pump (for 2 existing cold storage units)	See left
Insulated truck	Vehicle type: 4WD pickup truck (single cab) Bed: Aluminum insulated container Max. loading capacity: 500 kg No. of vehicles: 1	Vehicle type: Truck (single cab) Bed: Aluminum insulated container Max. loading capacity: 1 – 2 tons No. of vehicles: 1

Because a local mechanic has enough maintenance capability of refrigeration equipment using Freon, the change in refrigerant to the Freon-based R-404A will have no impact on maintenance capability, there is no need for a “soft component.” Furthermore, it is also considered that no spare parts other than standard accessories will be necessary.

2) Marigot Fishing Port

Cold storage

The existing cold storages in Marigot are used for keeping the most catch until the time that fish collector come from Roseau, except small volume sold at local market on same day of catch. Although fish collection from Roseau is made almost every day (5 days a week), the existing insulated van can carry only 500 kg of fish per day (max. 10 tons per month). Fish landing volume at Marigot (average of 2011 – 2013) is about 113 tons, varying monthly volume from 4.6 tons in December to 18.0 tons in March (See Table below). Fishing season is during March – May, when capacity of fish collection is not enough and the cold storages in Roseau are also full with fish, it is necessary to store fish in cold storages in Marigot.

Table 12: Monthly fish landing volume at Marigot

(Unit: kg)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2011	13,384	13,024	21,532	13,353	6,086	6,701	11,396	13,257	11,319	6,453	8,657	4,988	130,149
2012	4,833	8,960	17,640	10,379	10,763	9,091	7,452	11,189	8,961	5,305	6,280	6,943	107,794
2013	7,725	5,048	14,869	12,127	16,818	13,924	9,104	2,868	5,832	4,387	7,176	1,893	101,771
Average	8,647	9,011	18,013	11,953	11,222	9,905	9,318	9,104	8,704	5,382	7,371	4,608	113,238

Source: Dominica Fisheries Division

Cold storage takes place in two separated rooms (each room measuring roughly 30 m³ with a temperature of between -5 and -15°C) with one condensing unit (one evaporator is installed in each room). Based on the same thinking applied to Roseau, the motor capacity of the condensing unit will not be changed in order to keep power consumption down. Specifications designed to lower cooling temperature as far as possible with the new refrigerant will be used. Accordingly, using the new refrigerant while keeping motor capacity at the same level will result in a 20% reduction in capacity and an internal temperature of -12°C.

Table 13: Summary of plan for refrigeration facilities (Marigot Fishing Port)

Equipment description	Existing equipment details (refrigerant: R-22)	Converted equipment details (refrigerant: R-404A)
Cold storage unit (1)	Approx. 20 m ³ : -5 and -15°C	Approx. 20 m ³ , -12°C
Cold storage unit (2)	Same as above Each unit is separated by a partition 1 condensing unit (water-cooled condensation) cools 2 rooms	Same as above Same as above 1 condensing unit (evaporation-type condensation) cools 2 rooms

This equipment will similarly not require a “soft component” and spare parts, as well as Roseau Fishery Complex.

2-2-2-2. Submerged-Type Fish Aggregating Devices

Design conditions

A maximum wave height of 12 meters and wave cycle of 12 seconds are set as design conditions. These figures were arrived at by considering the 30-year probabilities for offshore wave height and cycle that were used as conditions for past grant aid-based fishery facilities construction in Dominica and neighboring countries and then selecting equivalent values. A tidal current of five knots is set as a design condition. This is the surface tidal current value used as a design condition for similar FADs in the sea areas around Okinawa, which have similar topographic conditions as Dominica and where numerous submerged-type FADs are installed.

Basic requirements for the submerged-type FADs to be used: The ocean area around Dominica has a deep-sea topography that plunges to depths of more than 2,000 meters within several nautical miles of the shore. Because of this, the FADs will be installed in deep-water areas, and thus submerged-type FADs that are designed for deep waters will be used. The FADs will have a structure that is resistant to the effects of the ocean waves and does not interfere with passing vessels, and will have long-term durability and effectiveness in attracting fish. Experienced technicians will construct a model of an FAD that is frequently utilized in Japan and has demonstrated durability of at least 10 years using materials of the same quality.

Number of FADs to be introduced: A total of two FADs (one on the Caribbean Sea side and one on the Atlantic Ocean side) will be introduced to ensure that fishing boats from multiple fishing villages will be able to travel to and utilize them.

General specifications

Submerged-type FAD: 2

Basic structure: To be comprised of a floating component (reef), tether, and anchor for fixing the device in place.

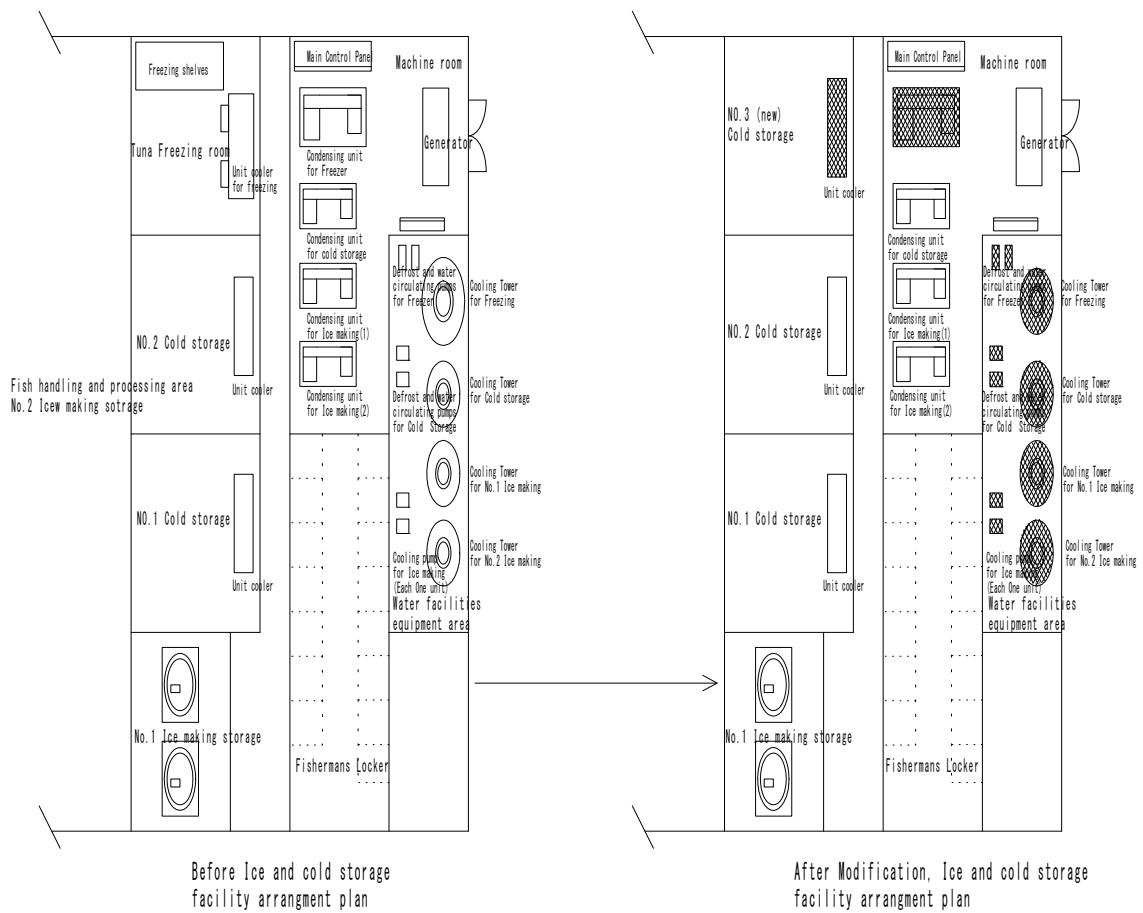
- Float shape and size: The floating component will have a basket-like or net-like structure. It will form a vertical cylinder when installed in the water. It will have a diameter of 1.5 to 2 meters and a length of 5 to 7 meters.

Float part of the floating component: Water pressure-resistant ABS spherical float; the necessary number to be lashed to an FRP frame.

- Mooring rope: To be constructed of synthetic fiber rope with sufficient strength and durability. The upper portion of the tether will be covered with a resin exterior material that will include SUS wire to prevent friction with fishing gear, etc.
- Anchor: Concrete block with sufficient weight to fix the FAD in place. A steel anchorage ring or truck tire for tying the mooring rope will be embedded into the top of the concrete block together with reinforcing bars. Suspending bars will be similarly prepared in four locations. Concrete strength: 180 kg/cm².
- Marking buoy: A marking buoy with a dry-battery type buoy light will be attached to the top of the floating component for the convenience of local fishing boats. The marking buoy is a consumable item and its tether strength will be such that the tether will break without harming the floating component if it becomes entangled with a fishing boat.

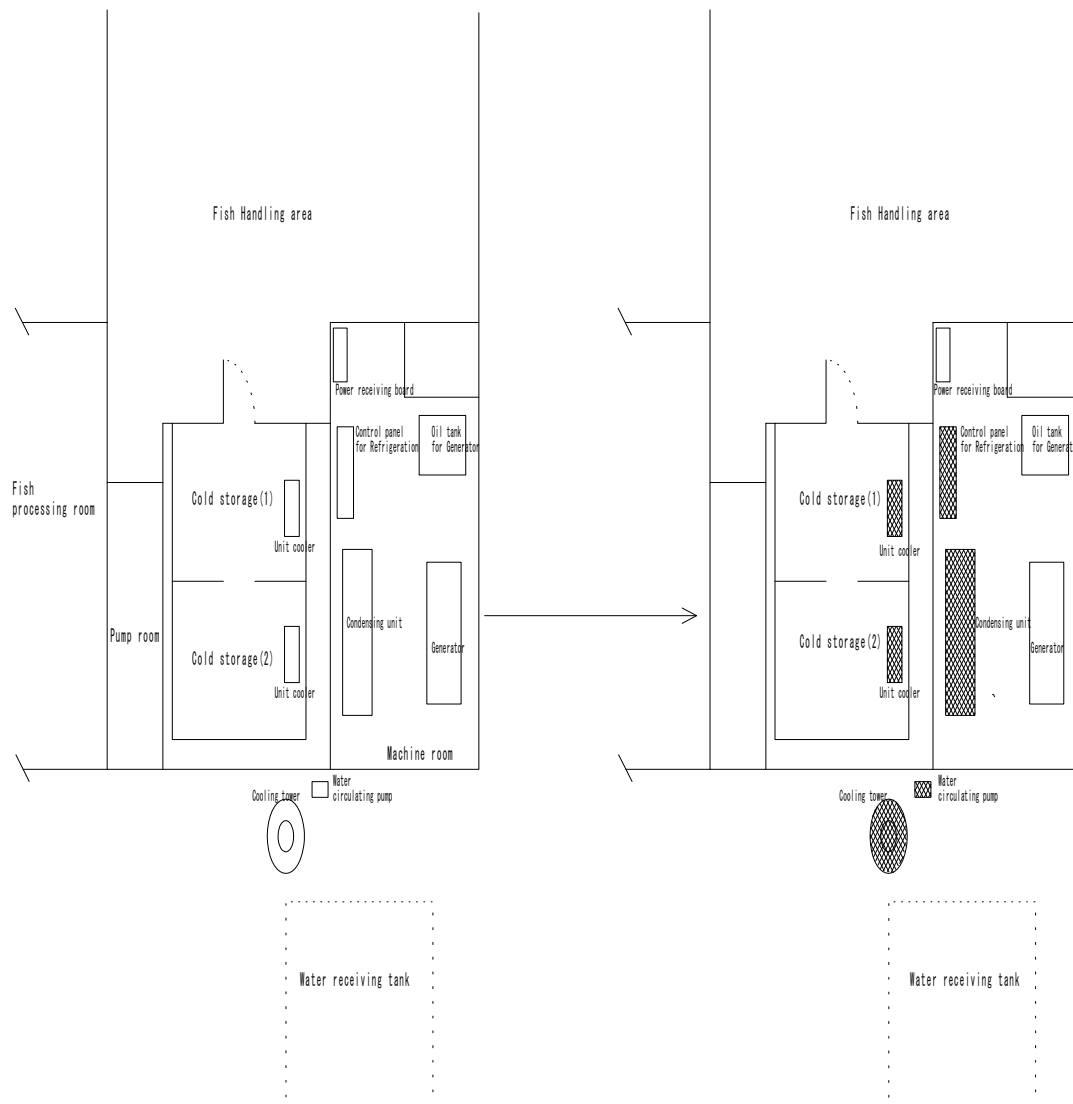
2-2-3. Outline Design Drawing

(1) Refrigeration facilities



Roseau Fisheries Complex
Ice and Cold storage facilities
Arrangement Plan

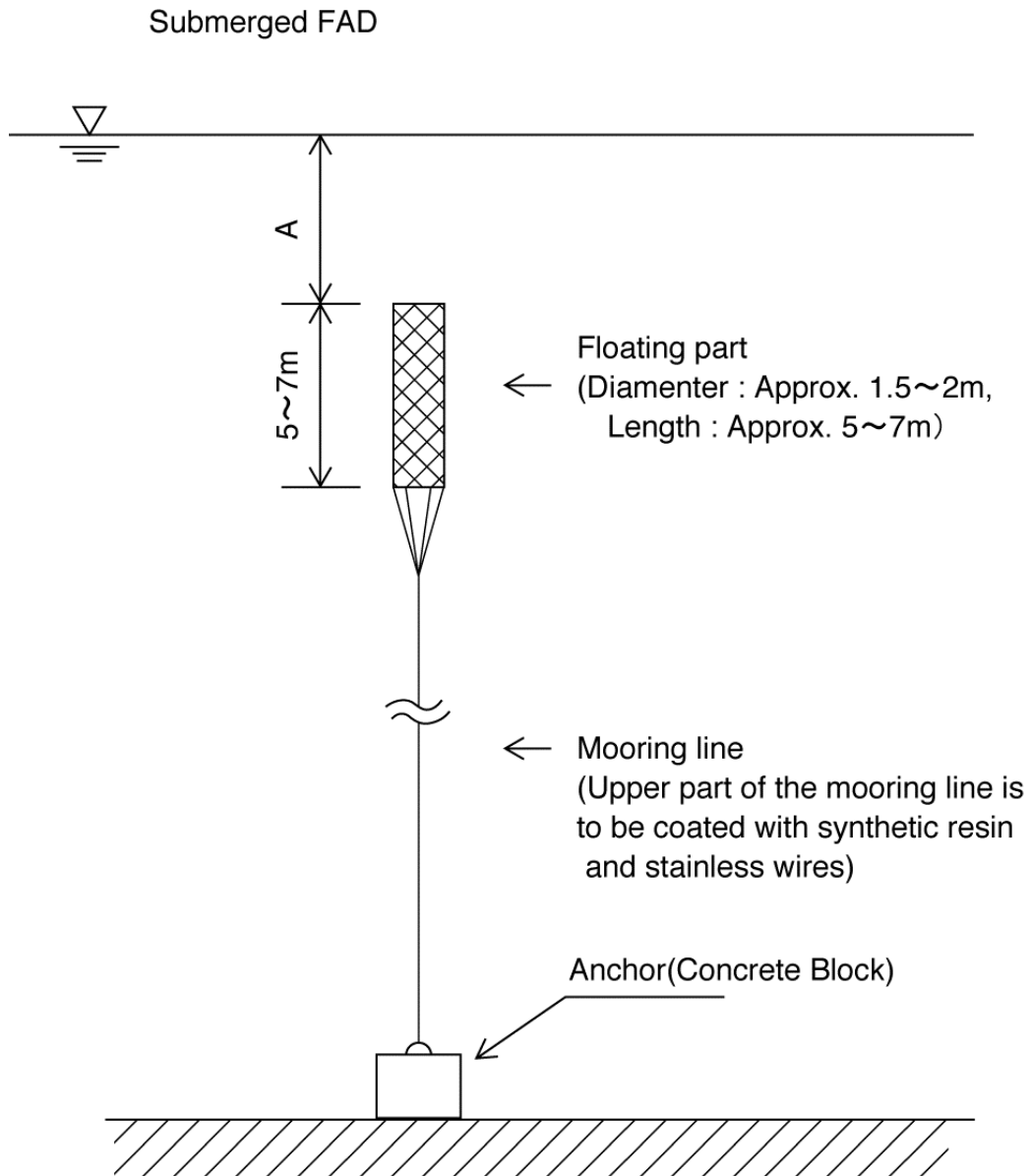
Figure 3: Refrigeration facilities at the Roseau Fisheries Complex



Marigot Fish port
Cold storage arrangement Plan

Figure 4: Refrigeration facilities at Marigot Fishing Port

(2) Submerged-type fish aggregating devices



(Note) A=Depth of Floating part : 20m or deeper when no current.
Under fishing condition (Wave height (H_{1/3}) : 3m, Period (T_{1/3}) 8 sec,
surface current 2 knot) : Approx. 100m or shallower.

Figure 5: Submerged-type fish aggregating device schematic

2-2-4. Implementation Plan

2-2-4-1. Implementation Policy

(1) Refrigeration facilities

- a) Given that replacement devices will be brought in for existing facilities and be installed together with plumbing work, it is preferable to use the same devices as the existing devices wherever possible. Therefore, Japanese-made products considered to have the same specifications will be procured.
- b) Selection of device specifications and device procurement will be made so as to ensure that the capacitance of newly introduced devices does not increase.
- c) Due to a lack of devices from manufacturers who maintain local agencies, Japanese products having the same specifications as existing devices will be procured. Products having the same structure and component composition will be procured whenever possible.
- d) Given the need to consider seawater salt damage, as the installation locations will be near the coastline, and in the interest of keeping material costs down, stainless steel products and products treated with salt-resistant coatings will be procured.

(2) Submerged-type FADs

- a) A manufacturer possessing specialized technical knowledge for the design, manufacture, and installation of submerged-type FADs and having long and abundant actual experience with them will be selected.
- b) FADs will be installed based on instructions provided by technicians to be dispatched by the manufacturer. Installation based on the technicians' instructions will take place after the technicians make final confirmation of the installation location's depth through a sounding/sea bottom topography survey at the planned location, determine the tether length, and then tie the tether.
- c) Of the structural components of submerged-type FADs, the concrete blocks that serve as anchors can be manufactured locally. Thus, they will be manufactured by a local business.

2-2-4-2. Implementation Conditions

(1) Refrigeration facilities

- a) During removal of devices inside the freezers, extreme care must be taken to ensure that walls and floors of the freezer (to be used as cold storage) are not damaged.
- b) The work schedule must be arranged so that major obstruction to the operation of existing cold storage does not occur during conversion of the freezer to cold storage.
- c) During installation, full attention will be paid to connections to existing power sources and water intakes, and efforts will be made to ensure that there are no inconsistencies.

(2) Submerged-type FADs

- a) The topography of the planned locations for submerged-type FADs must be as flat as possible, and the water depth must be accurately ascertained.
- b) There are no sounding devices available in Dominica that are capable of sounding in deep water, and thus sounding equipment must be brought from Japan for the depth survey. The same is true for flow

speed measurement equipment.

- c) Installation work will require a barge/crane, tugboat, work boat, and survey boat. However, because these items are unavailable in Dominica, it will be necessary to make prior arrangements for them in neighboring countries that have such marine construction equipment and then to bring them to Dominica in accordance with the installation schedule.
- d) Waiting time during rough weather: Consideration must be given to the arrangement of extra days for times when offshore work cannot proceed due to weather or ocean conditions.

2-2-4-3. Scope of Works

If this project is implemented based on grant aid from the Government of Japan, the scope of works will be as follows:

(1) Work undertaken by the Japanese side

- a) Procurement, testing, transport, installation, trial operation, and acceptance inspection of equipment and machinery
- b) Provision of services connected with detailed design and procurement/installation supervision
- c) Handling of procedures and acquisition of permits and approvals that are associated with manufacturing on the Japanese side
- d) Procurement of other required ancillary equipment and machinery and ancillary work

(2) Work undertaken by the Dominican side

- a) Disposal of equipment and machinery (industrial waste) after removal (The Japanese side will handle removal and transport to the designated site in Dominica.)
- b) Destruction of recovered refrigerant (Japan will handle recovery and transport to the designated site in Dominica.)
- c) Payment of electricity and water fees needed for the installation of refrigeration facilities
- d) Explanation to and securing of agreements from facility users

2-2-4-4. Consultant Supervision

Based on the content of the project's design, the consultant will conduct thorough examinations of the manufacturing details (construction in the case of the boat), details of device installation work, the work process plan, procurement plan, and the quality plan provided on the following page. The consultant will then engage in appropriate procurement management and installation management.

(1) Refrigeration facilities

The procurement of parts presents no particular problem, as they will be procured from Japan. However, given complaints from the recipient country that suppliers (including those in Japan) are unidentified, the consultant must note suppliers' names as well as the address, telephone number, and E-mail address of the departments in charge in completion documents.

(2) Submerged-type FADs

As part of management duties in Japan, the consultant will inspect and approve drawings and conduct an inspection at completion. In onsite management, the consultant will support the sounding/sea bottom topography surveys at the scheduled installation sites by the manufacturer's technicians and confirm sounding results, support installation work, confirm the completion of installation, and provide an explanatory report to the Fisheries Division.

2-2-4-5. Quality Control Plan

Full quality control will be practiced during the project in accordance with the following guidelines:

(1) Refrigeration facilities

- a) The consultant will clearly note on tender documents not only numerical values for cooling capability, etc., that will provide technical justification in line with project plans but also standards for materials.
- b) The inspection clearance forms will be submitted by manufacturers for all pressure devices for equipment.
- c) The consultant will attend with a local mechanic attached to the Fisheries Division for pressure tests and performance tests conducted for refrigerant pipes that are characteristic of refrigeration equipment, to confirm that new equipment maintains the same level of performance as replaced equipment.

(2) Submerged-type FADs

The consultant will conduct documentary inspections and floating component inspections. The consultant will be present for the sounding/sea bottom topography surveys to take place during local installation, confirm the results of sounding, be present during installation work, and confirm completion of installation.

2-2-4-6. Procurement Plan

In general, equipment and machinery that can be easily repaired with locally available parts will be selected and procured. However, items for which there is no local agency or that have insufficient local availability will be procured from Japan or a third country. The source of procurement of major equipment are as shown below:

Table 14: Source of procurement of major equipment

Name of equipment	Source of procurement		
	Local	Japan	Third Country
Refrigeration facilities		○	
Submerged-type FADs	○	○	
Insulated truck		○	○

(1) Refrigeration facilities

Since the Fisheries Division has already been purchasing and replacing the parts by procuring directly from Japan if necessary, it is enough to include spare parts for 1 year as standard accessories of manufacturers.

(2) Submerged-type FADs

Equipment and materials to be used in the FADs will be manufactured to have 10-year durability. Accordingly, no replacement parts will be needed. In actuality, the FADs will be unserviceable once they are installed.

2-3. Obligations of the Recipient Country

The recipient country will be responsible for the following items. The execution of these items should present no problems for Dominica in terms of the capabilities of its Ministry of Environment, Natural Resources, Physical Planning & Fisheries (responsible agency) and Fisheries Division (implementing agency).

Recipient country responsibilities	Implementation period
a) Import clearance procedures for project equipment and machinery into Dominica and exemption from import duties	Before equipment and machinery arrive at the port
b) Tax exemption measures for project equipment and machinery to be procured in Dominica	Before equipment and machinery are procured in-country
c) Acquisition and provision of places for installation of project equipment and machinery <ul style="list-style-type: none"> • Places for installing refrigeration facilities (inside existing fisheries complexes) 	Before equipment and machinery are installed in-country
d) Registration of the insulated truck	At the time of equipment and machinery delivery
e) Development of the environment at places for installation of project equipment and machinery <ul style="list-style-type: none"> • Supply of water and electricity to refrigeration facilities 	At the time of equipment and machinery installation
f) Disposal of equipment and machinery (industrial waste) after removal (The Japanese side will handle removal and transport to the designated site in Dominica.)	In accordance with recipient government standards
g) Destruction of recovered refrigerant (Japan will handle recovery and transport to the designated site in Dominica.)	In accordance with recipient government standards
h) Explanation to and securing of agreements from facility users	Before public announcement of bids for equipment and machinery
i) Provision of permit for installation of submerged-type FADs	Before public announcement of bids for equipment and machinery

2-4. Project Operation Plan

In general, the Fisheries Division will handle the operation and maintenance of equipment and machinery after completion of the project. All equipment and machinery can be sufficiently operated and maintained by existing personnel of the Fisheries Division, and therefore new staff increases will not be required.

Table 16: Operation and maintenance framework for project equipment and machinery

Component	Site	Equipment/machinery	Operation	Maintenance
Refrigeration facility	Roseau	Cold storage, cooling towers, insulated truck	Roseau Fishery Complex	Fisheries Division (outsourced)
	Marigot	Cold storage	Marigot Fishing Port	See above.
Submerged-type FADs	Caribbean Sea side, Atlantic Ocean side		Fisheries Division and NAFCOOP	See left

2-5. Project Cost Estimation

2-5-1. Initial Cost Estimation

(1) Costs to be borne by the Dominican side: EC\$18,000

- a) Commission charge for issuance of Authorization to Pay (A/P) EC\$18,000

(2) Conditions for estimation

- a) Time of estimate: August 2014
- b) Exchange rates: 1 US\$ = 102.87 yen
1 EC\$ = 38.26 yen
- c) Procurement period: Detailed design and equipment procurement periods are as noted in the Implementation Schedule.
- d) Other matters: Estimation shall be conducted based on the Grant Aid Cooperation scheme of the Government of Japan.

2-5-2. Operation and Maintenance Cost

(1) Refrigeration facilities (including facilities that will not be upgraded through the project)

- a) Roseau ([Ice plant capable of producing 4 tons per day x 2 plants] x 2 facilities; cold storage unit (2 rooms) x 1 unit; cold storage unit (1 room) x 1 unit)

Cost item	Breakdown	Estimated annual expense (EC\$)
Electricity	<p>Electric power consumption: Ice plants (22 kW) x 2; cold storage (2 rooms + 1 room; 22 kW) x 2 Ice-making operation time: 24 hours; actual cold storage operating time: 16 hours (22 x 2) 24 hr/day x 30 days = 31,680 kWh, (22 x 2) x 16 hr x 30 days = 21,120 kWh; total: 52,800 kWh</p> <p>Electricity charges: Basic charge: EC\$0 Contract capacity charge: EC\$95.04/22KVA = EC\$95.04 Fuel share: 0.4599/kWh Usage fee: EC\$0.713/kWh x 52,800 = EC\$37,646.4 Fuel charge: 0.4599 x 52,800 = EC\$24,283 Total monthly payment: 5.04 + 37,646.4 + 24,283 = EC\$62,024.44</p>	744,293
Water	<p>Water use: Ice-making: (4,000 x 1.05 x 2)/day x 30 days = 126,000 liters, 126,000/4.5=28,000 gallons Coolant water: ([0.022 x 30 x 60 x 60 x 0.01] 24/day x 4) x 30 days = 68,428.8 liters 68,428.8/4.5 = 15,166 gallons; total: 28,000 + 15,166 = 43,166 gallons</p> <p>Water charges: Meter use charge: EC\$0; basic charge: EC\$0 Usage fee: EC\$21.62/1,000gallons (up to 1,000 gallons) EC\$10.12/1,000 gallons (when use exceeds 1,000 gallons) Total monthly payment: 21.62 + 10.12 x (43,166/1000) = 21.62 + 436.84 = EC\$458.46/month</p>	5,501
Maintenance	<p>Annual maintenance cost: EC\$200 x 12 months = EC\$2,400/year Fund to cover major repair costs every five years (yearly): EC\$300/month x 12 months = EC\$3,600/year</p>	6,000
Total		755,794

b) Marigot (cold storage facility x 1)

Cost item	Breakdown	Estimated annual expense (EC\$)
Electricity	<p>Electric power consumption: Cold storage (5.5 kW) x 1, actual cold storage operating time: 16 hours $5.5 \times 16 \text{ hr} \times 30 \text{ days} = 2,640 \text{ kWh}$</p> <p>Electricity charges:</p> <p>Basic charge: EC\$0</p> <p>Contract capacity charge: $EC\\$95.04/22\text{KVA} = EC\\95.04</p> <p>Fuel share: 0.4599/kWh</p> <p>Usage fee: $EC\\$0.713/\text{kWh} \times 2,640 = EC\\$1,882.30$</p> <p>Fuel charge: $0.4599 \times 2,640 = EC\\$1,212.10$</p> <p>Total monthly payment: $95.04 + 1,882.3 + 1,212.1 = EC\\$3,189.44$</p>	38,273
Water	<p>Water use:</p> <p>Coolant water: $(0.022 \times 7.5 \times 60 \times 60 \times 0.01) 24/\text{day} \times 30 \text{ days} = 4,276.8$ $4,276.8/4.5 = 950.4$ gallons</p> <p>Water charges:</p> <p>Meter use charge: EC\$0; basic charge: EC\$0</p> <p>Usage fee: $EC\\$21.62/1,000\text{gallons}$ (up to 1,000 gallons) $EC\\$10.12/1,000$ gallons (when use exceeds 1,000 gallons)</p> <p>Total monthly payment: EC\$21.62/month</p>	259
Maintenance		
	Total	38,532

(2) Submerged-type fish aggregating devices

The main components of the submerged-type FADs will not require maintenance expenditure. If a marking buoy is attached to the floating component due to the need to improve convenience in fishing boat operation and aid fishery management, maintenance expenditure must include funding for replacement of buoys that are lost. Based on the frequency of past losses of floating-type FADs, it is assumed that a buoy will need to be replaced every three months, which will generate a yearly cost of EC\$2,800 per unit (EC\$5,600 for 2 units of submerged-type FADs). However, replacement and maintenance will be handled by the fishing boats that engage in FAD fishery, and therefore no fuel expenditure will be required.

The management organization will procure cylindrical reflectors, battery-powered flashing lights, floats, and other buoy parts, and using fishermen will assemble them. One buoy set will cost approximately EC\$600. When multiplied by four times per year, the cost will come to EC\$2,400. On top of this, the replacement of batteries every two weeks will cost EC\$400 annually. It should be noted that solar batteries become damaged when a marking buoy becomes submerged. For this reason, the above calculation assumes the use of batteries (automatic flashing day and night) with a certain degree of water pressure resistance (around 50 to 80 m).

Chapter 3: Project Evaluation

3-1. Preconditions

The preconditions for the implementation of this project, which include the customs clearance and tax exemption measures to be enacted by the Government of the Commonwealth of Dominica, are outlined below.

- a) Securing of sites for the disposal and processing of equipment and machinery
- b) Securing of sites for the appropriate management and processing of recovered refrigerants
- c) Issuance of permits for the installation of submerged-type FADs in the planned areas

3-2. Necessary Inputs by Recipient Country

The necessary inputs of the Government of the Commonwealth of Dominica to achieve and sustain the effectiveness of this project are outlined below.

- a) Assignment of a dedicated freezer repair technician (Roseau)
- b) Securing of budget funds for electricity, spare parts purchases etc.
- c) Continuous implementation of fisherman training for FAD fishing
- d) Re-installation of FAD site marking buoys (if they are washed away)

3-3. Important Assumptions

The assumptions that must be made in order to achieve and sustain the effectiveness of this project are outlined below.

- a) Wind, waves and currents exceeding the design conditions (i.e., historic maximum values recorded within the past 30 years) will not occur.
- b) Fishing grounds will not move and fishery resources will not decline due to climate change or other impacts.
- c) The number of fishermen and fishing vessels will not drastically decline due to socio-economic changes.
- d) The budget of the Fisheries Division will not be drastically cut due to the deterioration of national finances.

3-4. Project Evaluation

3-4-1. Relevance

The *Third Medium-Term Growth and Social Protection Strategy 2012 -2014*, the country's national development plan gave the infrastructure development as one of development objectives of fishery sector, while *A Fisheries and Aquaculture Policy for the Commonwealth of Dominica 2012 - 2037*, the country's 25-year fishery plan gave sustainable resource management. The Project will contribute to realization of efficient fish distribution through the improvement of functions of fish distribution facilities (infrastructure), which were introduced by Japan's past grant aid cooperation, as well as to promotion of fisheries management through introduction of submerged-type

fish aggregating devices (FAD), in conformity with the objectives set forth in the above national plan.

The Japan's Country Assistance Policy for the Commonwealth of Dominica adopts "fishery" as one of the important sectors, and states that "the cooperation for sustainable development and management of fisheries is extended". In addition, the Japan's Rolling Plan for the Commonwealth of Dominica adopts "support to sustainable development of fishery" as a development issue and "programme for support to development of fisheries and fishing community" as a cooperation programme. In this context, the Project, which will contribute to sustainable development of fisheries, is conformed to Japan's policy of 'Official Development Assistance' (ODA). Furthermore, the Commonwealth of Dominica has an important cooperative relation with Japan in fishery sector, so that the implementation of the Project is deemed as appropriate.

3-4-2. Effectiveness

(1) Quantitative effects

a) Purchases of fishery products by the Newtown Fishermen Cooperative (NFC)

Based in the Roseau Fishery Complex, NFC purchases fishery products primarily from Roseau and Marigot and stores and sells them. Under this project, the freezer at Roseau will be converted into cold storage and the aging cold storage at Marigot will be retrofitted, thus enabling the proper storage of fish catches. Additionally, the upgrade of the aging insulated truck will facilitate the effective transport of fish catches from the fishing villages in the Marigot region to Roseau. This is expected to allow NFC to continue purchasing the same volume of fishery products it currently does. NFC fishery product purchases reached 40.1 tons in 2012 and 38.5 tons in 2013, so the anticipated outcome of this project is that NFC will be able to continue purchasing 40 tons of fishery products per year.

b) Total number of fishing boats using the submerged-type FADs

There are currently 178 fishing vessels registered to use FADs. Although the Commonwealth of Dominica has formulated a draft of new Fisheries Regulations, they have not been officially enacted yet; therefore, there are still many privately-owned FADs, and the Fisheries Division does not know the precise number. In line with this project, FAD fishing regulations will be enacted, and all FADs and FAD fishermen will need to be licensed by the Fisheries Division. As such, all currently operating FAD fishing vessels will switch to using submerged-type FADs that are administered by the Fisheries Division. FAD fishing vessels do not engage in FAD fishing every day, but they fish elsewhere, or fish both inside and outside the FADs, on some days depending on market demand, fishing ground condition and/or fish catch level.

In Dominica, Fisheries Division monitoring data indicate that 178 FAD fishing vessels made 1,741 trips to FADS in 2013 (i.e., 9.8 trips per vessel), so based on this, if we assume that each boat will use submerged-type FADs at least nine times per year, then the target for the total annual number of vessels using FADs can be set at 1,600 vessels².

In cooperation with CARIFICO, the Fisheries Division has been instructing all FAD fishing vessel operators to keep complete log books, so it will be possible to obtain records on frequencies of fishing vessels operating around FADs at the time for 3 years after the project completion.

² No. of the licensed fishing vessels for FAD fishery : 178 currently registered vessels x 9 trips/year = 1,602 vessel-time.

c) Number of operating days of an insulated truck

Out of 4 units of insulated trucks (1-ton x 2 units and 2-tons x 2 units), which were introduced under Japan’s grant aid in 1997, the Fisheries Division has still been using a 1-ton insulated truck for ice delivery to and fish collection from Marigot. Fish collection is done almost every day during fishing season of pelagics, such as March – May, October – December. In this point of view, the project 2-ton insulated truck will be utilized for fish collection at least 120 days per year (6 days/week x 4 weeks/month x 6 months). On the other hand, it will not be necessary to transport ice from Roseau to Marigot as frequent as the present, since a 2-ton/day flake-ice making machine will be installed under the JICA’s follow-up project in 2015,

As such, the following have been defined as effect indicators for this project.

Indicator	Baseline (2014)	Target (2019)	Monitoring method
a) Purchases of fishery products by Newtown Fishermen’s Cooperatives (NFC)	39.3t	40t	Fishery product purchasing data (NFC)
b) Total number of fishing boats entered to the submerged-type FADs per annum	0	1,600 vessels	Data collected from FAD fishermen’s log books (Fisheries Division)
c) Annual operating days of an insulated truck	0	120 days	Vehicle operating record (Fisheries Division)

(2) Qualitative effects

The following is a list of the anticipated qualitative effects of this project.

- Improved freshness of fishery products and consumer satisfaction therewith due to upgrades to refrigeration facilities (as revealed by interview surveys).
- Spread of and enhanced understanding of managed fishery among fishermen due to the installation of submerged-type FADs (as revealed by interview surveys).

APPENDICES

Appendix 1. Member List of the Study Team

JICA

Name	Role	Organization	Field Survey
Mr. Yoshihisa MASANAGA	Team Leader	Deputy Director, Field Crop Based Farming Area Division, Rural Development Department, JICA	1 st
Mr. Isao KOYA	Team Leader	Senior Advisor to the Director General, Rural Development Department, JICA	2 nd
Mr. Hiroyuki TANAKA	Cooperation Plan	Advisor, Grant Aid Project Management Division 3, Financial Cooperation Implementation Department, JICA	2 nd

Consultant

Name	Role	Organization	Field Survey
Mr. Hiroshi FUKAO	Chief Consultant / Operation and Management Plan	OAFIC Co., Ltd.	1 st and 2 nd
Mr. Junichiro MORI	Refrigeration Facilities Plan / Cost Estimate 1	OAFIC Co., Ltd.	1 st
Mr. Kazumi IIDA	Fishery Related Equipment Plan / Environmental & Social Consideration / Cost Estimate 2	OAFIC Co., Ltd.	1 st
Mr. Kazuo TAKEDA	Fishing Boat Surveillance Plan / Cost Estimate 3	OAFIC Co., Ltd.	1 st

Appendix 2. Study Schedule

【1st Field Survey】			Activity (Consultant)	
Date	Activity (JICA)	Chief Consultant	Other members	
1 7/21 Mon		15:05 Narita→14:49 New York (DL172)		
2 7/22 Tue	0:30 Haneda→17:55 Seattle 21:58→06:06 New York 08:55→13:09 Saint Maarten 16:00→16:40 Antigua (DL580/DL1542/DL461/ L1501)	07:00 New York→10:54 San Juan 14:40→16:05 Antigua (DL2365/L1563)		
3 7/23 Wed	Antigua Fisheries Division: Explanation of IC/R. Site survey.			
4 7/24 Thu	Site survey			
5 7/25 Fri	Discussion on scope of project. Signing on Minutes of Discussion.			
6 7/26 Sat	09:55 Antigua→ 10:25 St. Kitts (LI310)			
7 7/27 Sun	Rest			
8 7/28 Mon	St. Kitts Department of Marine Resources: Explanation of IC/R. Site survey.			
9 7/29 Tue	Discussion on scope of project. Signing on Minutes of Discussion. 21:50 St. Kitts → 22:20 Antigua (LI369)	15:05 Narita→14:49 New York (DL172)		
10 7/30 Wed	06:00 Antigua →06:40 Dominica (LI361) Dominica Fisheries Division: Explanation of IC/R. Site survey.	07:00 New York→10:50 San Juan 14:20→16:05 Dominica (DL315 / L1565)		
11 7/31 Thu	Site survey (Fond St. Jean, Morne Espanol, Marigot, Portsmouth)			
12 8/1 Fri	Discussion on scope of project. Signing on Minutes of Discussion.	Site survey (Roseau) on refrigeration facility, fishing boats/fishers, and rader sites.		
13 8/2 Sat	Document Arrangement			
14 8/3 Sun	07:00 Dominica → 09:35 Port of Spain (LI361)	Rest		
15 8/4 Mon	10:30 Courtesy call to EOJ	National holiday in Dominica (August Monday)		
16 8/5 Tue	00:35 Port of Spain → 05:50 New York 09:40 → 12:46 Seattle 15:01 → (BW520/DL480/DL167)	Visit NTRC. Hearing to local construction companie. Refrigeration facilities syrvey and stakeholders meeting (Marigot).		
17 8/6 Wed	16:55 Narita	Visit Coast Guard. Hearing to local construction companies. Stakeholders meeting (Roseau).		
18 8/7 Thu		Survey on radar sites (Fond St. Jean, Petit Savanne). Refrigeration facilities syrvey and stakeholders meeting (Portsmouth).		
19 8/8 Fri		Wrap-up meeting at Dominica Fisheries Division and data collection. Courtesy call to the Minister.		
20 8/9 Sat		15:35 Dominica→16:15 Antigua (LI364)		
21 8/10 Sun		Rest		
22 8/11 Mon		Meeting at Antigua Fishereis Division. Site survey (Point Wharf/Market Wharf). Visit LIME.		
23 8/12 Tue		Site survey and stakeholders meeting (Urlings and Parham). Visit Ministry of Information, Telecommunication, Broardcasting , Science and Technology.		
24 8/13 Wed		Survey on radar sites (Mt. Obama, Freetown). Hearing to local construction companies. Survey on boats and FADs of Fisheries Division.		
25 8/14 Thu		Visit Coast Guard, APU/A and private construction companies. Survey on operation plan of multipurpose boat.		
26 8/15 Fri		Meeting with AFL Chairman. Document arrangement.		
27 8/16 Sat		Site survey (Barbuda Island).		
28 8/17 Sun		Rest		
29 8/18 Mon		Wrap-up meeting with Antigua Fisheries Division and data collection.		
30 8/19 Tue		09:55 Antigua→10:25 St. Kitts (LI310). Meeting at St. Kitts Department of Marine Resources. Hearing to local construction companies.		
31 8/20 Wed		Visit Dept. of Physical Planning and Environment, Coast Guard, and The Cable. Site survey (Basseterre) on refrigeration facility.		
32 8/21 Thu		Survey on radar sites (Dieppe Bay, Bayfords, Otley's Level). Stakeholders meeting (Old Road).		
33 8/22 Fri		Wrap-up meeting with Dept. of Marine Resources. Meeting with LIME.		
34 8/23 Sat		Site survey (Nevis Island). Visit VON Radio and radar site.		
35 8/24 Sun		Rest		
36 8/25 Mon		Survey on FAD fishing and boats of DMR. Discussion on operation plan of multipurpose boat.		
37 8/26 Tue		Data collection at DMR. Meeting with DIGICEL. Hearing to local construction companies.		
38 8/27 Wed		14:55 St. Kitts→15:25 Antigua 17:25→20:00 Port of Spain (LI315 / LI309)	09:00 St. Kitts→09:30 Antigua 10:30→11:55 San Juan 14:29→18:30 Atlanta (LI521 / LI362 / DL1595)	
39 8/28 Thu		Courtesy call to Embassy of Japan in Trinidad	13:47 Atlanta →(DL295)	
40 8/29 Fri		06:00 Port of Spain→09:10 Antigua 10:30→11:55 San Juan 16:30→20:20 New York (LI310 / LI362 / DL332)	16:30 Narita	
41 8/30 Sat		14:50 New York→(DL473)		
42 8/31 Sun		17:35 Narita		
【2nd Field Survey】			Activity (Chief Consultant)	
Date	Activity (JICA)	Activity (Chief Consultant)		
1 11/24 Mon		Narita→New York		
2 11/25 Tue	Haneda→Los Angeles→Miami→Antigua→Dominica	New York→San Juan→Antigua→Dominica		
3 11/26 Wed	Dominica Fisheries Division: Explanation of outline of Preparatory Survey Report (Draft). Site obseration (Roseau). Survey on Yamaha local agents.			
4 11/27 Thu	Discussion and signing on Minutes (Dominica). Site obseration (Portsmouth, Anse de Mai, Marigot)			
5 11/28 Fri	Site obseration (Stowe, Fond St. Jean, Scotts Head)			
6 11/29 Sat	Dominica→Antigua→St. Kitts (LI580/LI312,08:50/09:30, 10:35/11:05)			
7 11/30 Sun	Rest			
8 12/1 Mon	St. Kitts Department of Marine Resources: Explanation of outline of Preparatory Survey Report (Draft).			
9 12/2 Tue	Discussion and signing on Minutes (St. Kitts).			
10 12/3 Wed	St. Kitts→Antigua(LI521, 09:00/09:30). Antigua Fisheries Division: Explanation of outline of Preparatory Survey Report (Draft). AFL: Explanation of equipment for AFL. Site obseration (Point Wharf, Market Wharf, Keeling Point).			
11 12/4 Thu	Site obseration (Parham, Urlings)			
12 12/5 Fri	Discussion and signing on Minutes (Antigua).			
13 12/6 Sat	Antigua→Port of Spain	Rest	Antigua→St. Martin	
14 12/7 Sun	Rest	Antigua→Dominica→San Juan→Santo Domingo	St. Martin→New York	
15 12/8 Mon	Embassy of Japan in Trinidad	JICA Office in Dominican Republic	Lv. New York	
16 12/9 Tue	Port of Spain→New York→	Santo Domingo→New York→	Ar. Narita	
17 12/10 Wed	Ar. Narita	Ar. Narita		

Appendix 3. List of Parties Concerned in the Recipient Country

Ministry of Environment, Natural Resources, Physical Planning & Fisheries

Hon. Dr. Kenneth Darroux	Minister
Mr. Harold Guiste	Permanent Secretary
Fisheries Division	
Mr. Andrew Magloire	Chief Fisheries Officer
Mr. Norman Norris	Senior Fisheries Officer
Mr. Jullien Defoe	Fisheries Officer
Mr. Riviere Sebastin	Fisheries Officer
Mr. Derrick Theophile	Fisheries Officer
Ms. Glenda Thomas	Manager - Portsmouth Fishery Center

Environment Coordination Unit (ECU)

Mr. Lloyd Pascal	Head
Mr. Collin GUISTE	Staff

Physical Planning Division

Mr. Kelvin Rolie	Chief Physical Planner
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Land & Survey Division

Mr. Vivlan Eugene	Land Surveyor
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National Telecommunication Regulatory Commission (NTRC)

Mr. Craig Nesty	Executive Director
Mr. George James	Engineer

Dominica Police Force

Mr. Daniel Carbon	Chief
Mr. Cornelius Francis	X/O Training Officer
Mr. Clim Bruno	Inspector of Coast Guard

Private Companies

Mr. Patrick Paul	Director – Caribbean Contractors Dominica Ltd.
Mr. Stewart F. Paris	Managing Director – Stewco Construction Co., Ltd.
Mr. Christopher B. Sorhaindo	Director – ACE Engineering
Mr. Swanston Carbon	Manager – Carbon Refrigeration Services Co., Ltd.
Mr. Kentish Pascal	Manager – Subzero Degrees

Appendix 4. Minutes of Discussion (M/D)

(1) At the First Field Survey


MINUTES OF DISCUSSIONS
ON
THE PREPARATORY SURVEY
FOR
THE PROJECT FOR IMPROVEMENT OF FISHERY EQUIPMENT AND MACHINERY
IN
THE COMMONWEALTH OF DOMINICA

The Japan International Cooperation Agency (hereinafter referred to as "JICA") decided to conduct a Preparatory Survey for "the Project for Improvement of Fishery Equipment and Machinery in the Commonwealth of Dominica" (hereinafter referred to as "the Project") and sent the survey team (hereinafter referred to as "the Team") to the Commonwealth of Dominica, headed by Mr. Yoshihisa MASANAGA, Deputy Director, Rural Development Department, JICA. The Team is scheduled to stay in the country from 30th of July to 9th of August, 2014.

The Team held a series of discussions with officials concerned of the Government of the Commonwealth of Dominica (hereinafter referred to as "GOCD") and conducted field surveys at the study area.

As a result of the discussions and the field surveys, both parties confirmed the main items described in the attached sheets.

Roseau, 1st of August, 2014



Mr. Yoshihisa MASANAGA
Leader,
Preparatory Survey Team,
Japan International Cooperation Agency



Mr. Harold Guiste
Permanent Secretary,
Ministry of Environment, Natural Resources,
Physical Planning and Fisheries,
The Commonwealth of Dominica

ATTACHMENT

1. Title of the Project

Both sides confirmed that the title of the Project was "the Project for Improvement of Fishery Equipment and Machinery in the Commonwealth of Dominica".

2. Objective of the Project

Both sides defined the objective of the Project as to improve fishery product distribution and fisheries management, by upgrading and replacing of equipment/machinery and its accompanying facilities that were previously installed by Japan's Grant Aid, as well as, by installing new equipment/machinery responding to new needs on fisheries management.

3. Responsible and Implementing Agency

The responsible agency shall be the Ministry of Environment, Natural Resources, Physical Planning and Fisheries.

The implementing agency shall be the Fisheries Division under the Ministry of Environment, Natural Resources, Physical Planning and Fisheries.

The organization chart of the Ministry of Environment, Natural Resources, Physical Planning and Fisheries, and the Fisheries Division is shown in Annex-1.

4. Project site

The Project site is shown in Annex-2.

5. Items requested by the GOCD

After discussion, both sides confirmed the items requested by the GOCD. They are listed in Annex-3. However, Annex-3 shall be revisable, if both sides ascertain needs to new items, which are consistent with the objective of the Project, in the course of this survey.

6. Japan's Grant Aid Scheme

The Dominican side understood the Japan's Grant Aid Scheme explained by the Team as described in the Annex-4 and shall take the necessary measures as specified in the Annex 5 for smooth implementation of the Project.

7. Further schedule of the Study

- (1) Based on the survey results, JICA will prepare the draft report including the outline design of the Project and dispatch a mission in order to explain its contents tentatively scheduled in November, 2014.
- (2) Once both sides agree in principle on the contents of the report, JICA will finalize the report and send it to the GOCD by the end of March, 2015.

8. Environmental and social considerations

In order to ensure that appropriate environmental and social considerations are to be made for the Project, the Dominican side agreed to abide by 'JICA Guidelines for Environmental and Social Considerations' in addition to the national environmental laws and regulations in the Commonwealth of Dominica.

It was affirmed that the Fisheries Division would take charge of conducting the Environmental Impact Assessment and obtain an environmental permission from the authorities concerned in the GOCD before the implementation of the Project.

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9. Other important issues

(1) Official request letter for Grant Aid from Japan

The Dominican side agreed that the the GOCD should submit "Application Form for Grant Aid from Japan" to the Government of Japan (hereinafter referred to as "GOJ") through diplomatic channel during the survey. The list of items requested as Annex-3 should be attached to the application form.

(2) Decision of the final items of the Project

The Dominican side understood the followings:

- a. After this survey, JICA would prepare the outline design and estimate costs of the Project through further studies in Japan.
- b. The GOJ would scrutinize the outline design and costs, taking the Japanese side's budget into consideration.
- c. Through these processes, the Japanese side would decide the final items of the Project.
- d. Therefore, all items listed in Annex-3 might not be assured to be the final items.

(3) Disposal of equipment/machinery/facilities

The Dominican side agreed that if it is necessary to dispose for implementation of the Project any fishery equipment/machinery/facility installed by the previous Japan's Grant Aid, the GOCD should inform the GOJ through the diplomatic channel based on the Exchange of Notes (E/N) before disposing it.

(4) Explanation to stakeholders

The Dominican side agreed that the GOCD should explain to the stakeholders concerned the equipment/machinery/facilities that would be disposed for the Project before starting the Project, and to ensure that they could obtain substitutes.

(5) Undertakings to be taken by the GOCD

The Dominican side understood that the GOCD should take necessary measures by its own expenses if existing equipment/machinery/facilities should be disposed and/or enough space should be assured for implementation of the Project.

However, both sides agreed that they would explain to their own Government the appropriateness that installation of new equipment/machinery/facilities and disposal of existing equipment/machinery/facilities should be implemented as a work in the Project, if installation and disposal is inseparably related to each other.

(6) Questionnaires

The Team requested the Dominican side to submit answers to Questionnaires mentioned in Inception Report by 8th of August. The Dominican side agreed with this request.

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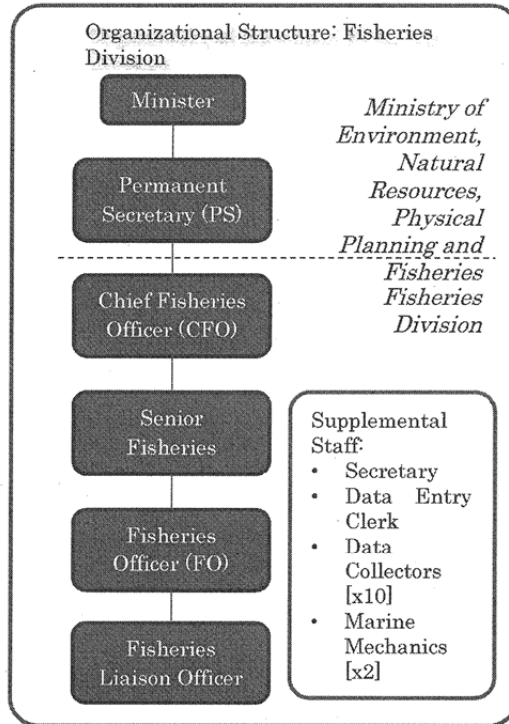
Annex 1	Organization charts
Annex 2	Location of the Project site
Annex 3	List of items requested by the Government of the Commonwealth of Dominica
Annex 4	Japan's grant aid scheme
Annex 5	Major undertakings to be taken by each Government

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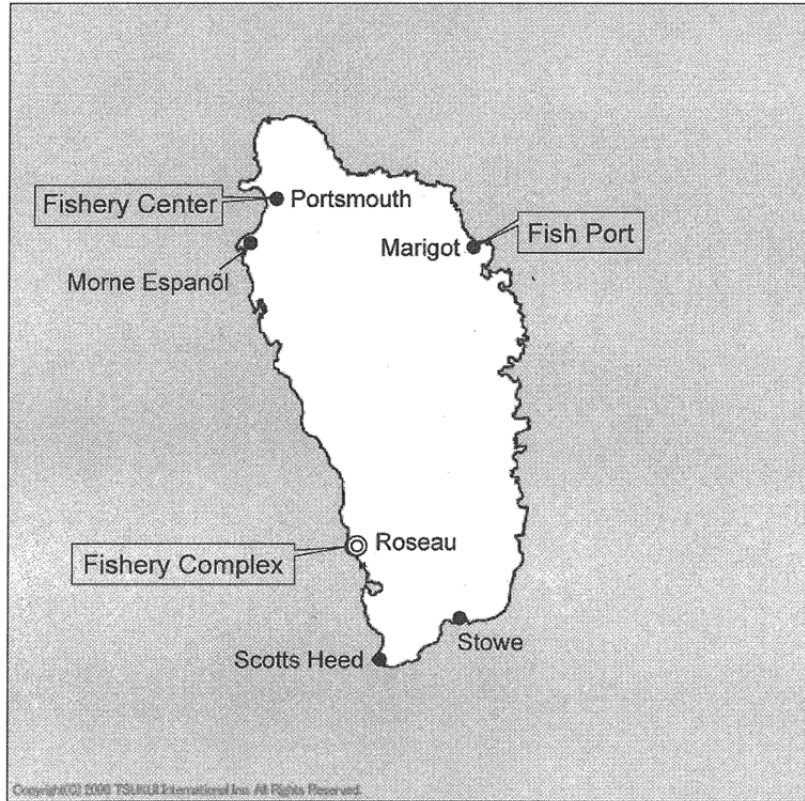
Organization charts

Annex 1



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List of items requested by the GOCD

[Replacement of existing equipment and incidental facilities]

- ① Replacement of Refrigeration and Marketing Equipment
 - 1) Conversion of blast freezer to cold storage for Roseau
 - 2) Insulated truck (500 kg x 2 units) for Roseau
 - 3) Water-cooled condenser, cooling tower, compressor for Marigot
- ② Replacement of water supply equipment
 - 1) Water reservoir tank (with pump and piping) for Roseau
 - 2) Water supply system for Marigot
- ③ Repair tools for the existing machinery and equipment

[Equipment which is assumed to be newly introduced]

- ④ Surveillance radar system (3 sets)
- ⑤ VHF repeater and VHF base station (2 sets)
- ⑥ Submerged type fish aggregating device (2 sets)
- ⑦ Multipurpose boat for deployment and monitoring of FADs (1 unit)
- ⑧ Materials for local FADs (sinker, rope, float, fittings, etc.)
- ⑨ Fishery data collection and analysis system

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Japan's grant aid scheme

The Government of Japan (hereinafter referred to as "the GOJ") is implementing the organizational reforms to improve the quality of ODA operations, and as a part of this realignment, a new JICA law was entered into effect on October 1, 2008. Based on this law and the decision of the GOJ, JICA has become the executing agency of the Grant Aid for General Projects, for Fisheries and for Cultural Cooperation, etc. The Grant Aid is non-reimbursable fund provided to a recipient country to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for its economic and social development in accordance with the relevant laws and regulations of Japan. The Grant Aid is not supplied through the donation of materials as such.

1. Grant Aid Procedures

The Japanese Grant Aid is supplied through following procedures:

- Preparatory Survey
 - The Survey conducted by JICA
- Appraisal & Approval
 - Appraisal by the GOJ and JICA, and Approval by the Japanese Cabinet
- Authority for Determining Implementation
 - The Notes exchanged between the GOJ and a recipient country
- Grant Agreement (hereinafter referred to as "the G/A")
 - Agreement concluded between JICA and a recipient country
- Implementation
 - Implementation of the Project on the basis of the G/A

2. Preparatory Survey

(1) Contents of the Survey

The aim of the Preparatory Survey is to provide a basic document necessary for the appraisal of the Project made by the GOJ and JICA. The contents of the Survey are as follows:

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of relevant agencies of the recipient country necessary for the implementation of the Project.
- Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, financial, social and economic point of view.
- Confirmation of items agreed between both parties concerning the basic concept of the Project.
- Preparation of an outline design of the Project.
- Estimation of costs of the Project.

The contents of the original request by the recipient country are not necessarily approved in their initial form as the contents of the Grant Aid project. The Outline Design of the Project is confirmed based on the guidelines of the Japan's Grant Aid scheme.

JICA requests the Government of the recipient country to take whatever measures necessary to achieve its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the organization of the recipient country, which actually implements the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country based on the Minutes of Discussions.

(2) Selection of Consultants

For smooth implementation of the Survey, JICA employs (a) registered consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms.

(3) Result of the Survey

JICA reviews the Report on the results of the Survey and recommends the GOJ to appraise the implementation of the Project after confirming the appropriateness of the Project.

3. Japan's Grant Aid Scheme

(1) The E/N and the G/A

After the Project is approved by the Cabinet of Japan, the Exchange of Notes (hereinafter referred to as "the E/N") will be signed between the GOJ and the Government of the recipient country to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Government of the recipient country to define the necessary articles to implement the Project, such as payment conditions, responsibilities of the Government of the recipient country, and procurement conditions.

(2) Selection of Consultants

In order to maintain technical consistency, the consulting firm(s), which conducted the Survey, will be recommended by JICA to the recipient country to continue to work on the Project's implementation after the E/N and G/A.

(3) Eligible source country

Under the Japanese Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. When JICA and the Government of the recipient country or its designated authority 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, constructing and procurement firms, and the prime consulting firm are limited to "Japanese nationals".

(4) 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 JICA. This "Verification" is deemed necessary to fulfill accountability to Japanese taxpayers.

(5) Major undertakings to be taken by the Government of the Recipient Country

In the implementation of the Grant Aid Project, the recipient country is required to undertake such necessary measures as Annex.

(6) "Proper Use"

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

(7) "Export and Re-export"

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

(8) Banking Arrangements (B/A)

a) The Government of the recipient country or its designated authority should open an account under the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). JICA 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 JICA under an Authorization to Pay (A/P) issued by the Government of the recipient country or its designated authority.

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(9) Authorization to Pay (A/P)

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

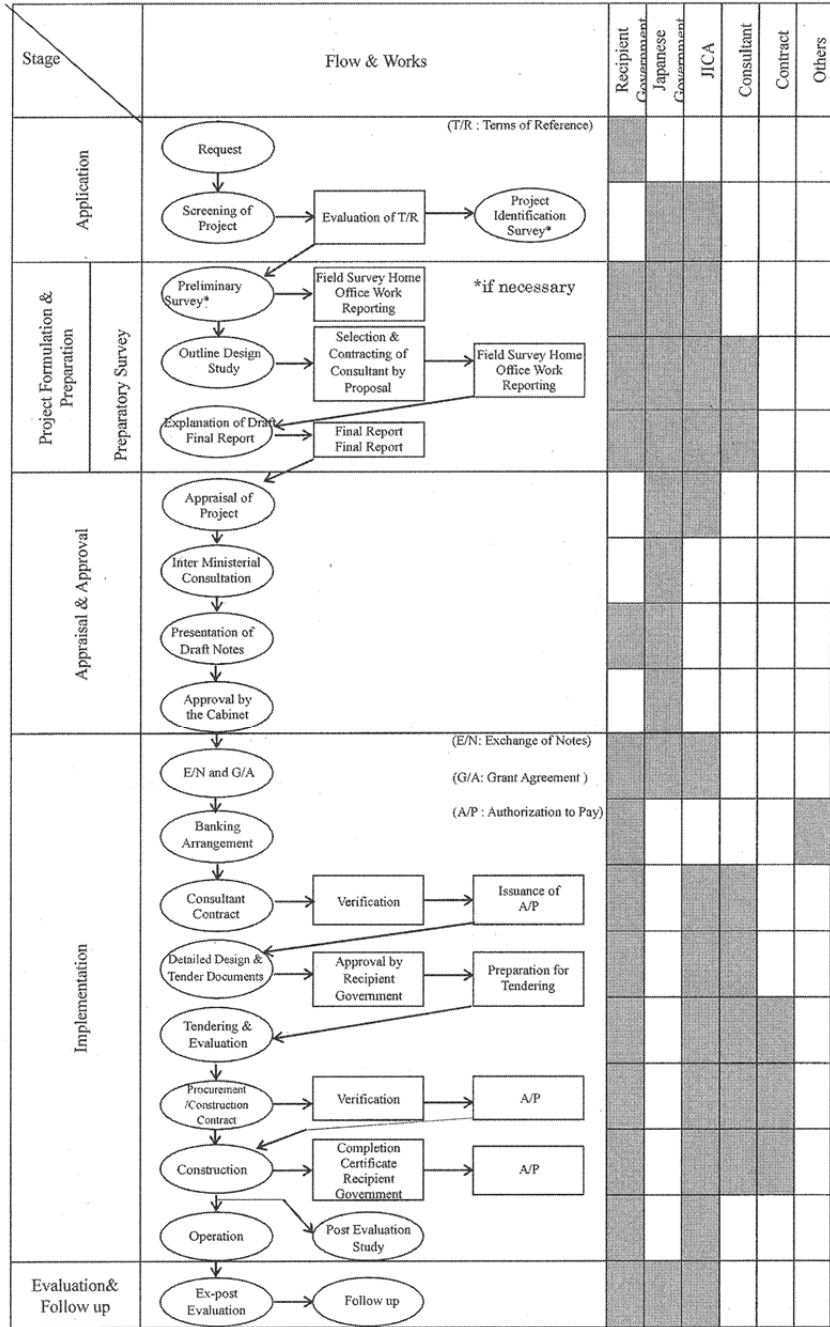
(10) Social and Environmental Considerations

A recipient country must carefully consider social and environmental impacts by the Project and must comply with the environmental regulations of the recipient country and JICA socio-environmental guidelines.

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FLOW CHART OF JAPAN'S GRANT AID PROCEDURES



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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 [in lot] / [lots] of land necessary for the implementation of the Project and to clear the sites;		●
2	To construct the following facilities		
	1) The gates and fences in and around the site		●
	2) The road outside the site		●
3	To provide facilities for distribution of electricity, water supply and drainage and other incidental facilities necessary for the implementation of the Project outside the sites.		
	1) Electricity		
	a. The distributing power 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 city water distribution main to the site		●
	b. The supply system within the site (receiving and elevated tanks)	●	
	3) Furniture and Equipment		
	a. General furniture		●
	b. Project equipment	●	
4	To ensure prompt unloading and customs clearance of the products at ports of disembarkation in the recipient country and to assist internal transportation of the products.		
	1) Marine (Air) transportation of the Products from Japan to the recipient country	●	
	2) Internal transportation from the port of disembarkation to the project site	(●)	(●)
5	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the purchase of the products and the services be exempted.		●
6	To accord Japanese physical persons and / or physical persons of third countries whose services may be required in connection with the supply of the products and the services such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work		●
7	To ensure that the Facilities and the products be maintained and used properly and effectively for the implementation of the Project		●
8	To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project		●
9	To bear the following commissions paid to the Japanese bank for banking services based upon the B/A		
	1) Advising commission of A/P		●
	2) Payment commission		●
10	To give due environmental and social consideration in the implementation of the Project.		●

(B/A : Banking Arrangement, A/P : Authorization to pay)

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(2) At the Second Field Survey (Explanation of Draft Report)

MINUTES OF DISCUSSIONS
ON
THE PREPARATORY SURVEY
FOR
THE PROJECT FOR IMPROVEMENT OF FISHERY EQUIPMENT/ MACHINERY
IN
THE COMMONWEALTH OF DOMINICA
(EXPLANATION OF DRAFT REPORT)

In July and August 2014, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Preparatory Survey Team on "the Project for Improvement of Fishery Equipment/ Machinery in the Commonwealth of Dominica" (hereinafter referred to as "the Project"). Through discussions, field surveys and technical examination of the results of the survey in Japan, JICA prepared the draft report of the Project.

In order to explain and to discuss with the authorities concerned to the Government of the Commonwealth of Dominica (hereinafter referred to as "GOCD") about the components of the draft report, JICA sent a Preparatory Survey Team (hereinafter referred to as "the Team") to the Commonwealth of Dominica from November 25 to 29, 2014 headed by Mr. ISAO KOYA, Senior Advisor to Director General, Rural Development Department, JICA.

As a result of the discussions, both sides confirmed the main items described in the attached sheets.

Roseau, November 27, 2014

甲谷伊佐雄

Mr. Isao KOYA
Leader,
Preparatory Survey Team,
Japan International Cooperation
Agency



Mr. Harold Guiste
Permanent Secretary
Ministry of Environment, Natural
Resources, Physical Planning and Fisheries
The Commonwealth of Dominica

ATTACHMENT

1. Components of the draft report

The GOCD agreed and accepted the components of the draft report explained by the Team including obligations of the recipient country which are mentioned in the Chapter three (3) of the draft report. It is understood that further request of change in the Project components shall not be considered; however, the components of the Project are still subject to change depending upon the result of the tender for contractor.

2. Japan's Grant Aid Scheme

The GOCD reconfirmed its understanding of the Japan's grant aid scheme and major undertakings of each Government as described in the Annex 4 and 5 of the Minutes of Discussions signed on August 1, 2014.

3. Further schedule of the Preparatory Survey

JICA will complete the final report in accordance with the confirmed items and send it to the GOCD by the middle of March, 2015.

4. Estimated cost of the Project

The Team provided the estimated cost of the Project as described in the Annex 1. The GOCD understood that the estimated cost was not final and was subject to change in the course of appraisal by the Government of Japan.

5. Confidentiality of the Project

The GOCD affirmed that the estimated cost of the Project, together with other information related to the Project such as facility design drawings and specifications of equipment, shall not be duplicated and released to any outside parties before conclusion of all the contract(s) for the Project since they are confidential information that is concerned with the tender.

6. Environment and Social Considerations

In order to ensure that appropriate environmental and social considerations are to be made for the Project, the GOCD agreed to abide by 'JICA Guidelines for Environmental and Social Considerations' in addition to the national environmental laws and regulations of the Commonwealth of Dominica.

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ANNEX 1 Estimated cost of the Project

This Page is closed due to the confidentiality.

(2) Estimated Cost to be borne by the Commonwealth of Dominica

Commission charge for insurance of Authorization to Pay (A/P): EC\$ 18,000

Note:

(1) The cost estimates in the above table are provisional and will be further examined by the government of Japan for approval of the Grant.

(2) Condition for estimation

- a) Time of estimation : August, 2014
- b) Exchange rates : 1US\$=102.87 JPY
1EC\$=38.26 JPY
- c) Implementation schedule : Referred to "Implementation Schedule"
specified in the draft report of the Preparatory
Survey

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ANNEX 2 Obligation of the recipient country

Recipient country responsibilities	Implementation period
a) Acquirement and provision of places for installation of project equipment and machinery · Places for installing refrigeration facilities (inside existing fisheries complexes)	Before equipment and machinery are installed in-country
b) Registration of the insulated truck to be undertaken by Dominica	At the time of equipment delivery
c) Development of the environment at places for installation of project equipment and machinery · Supply of water and electricity to refrigeration facilities	At the time of equipment and machinery installation
d) Disposal of equipment and machinery (industrial waste) after removal (The Japanese side will handle removal and transport to the designated site in Dominica.)	In accordance with recipient government standards
e) Destruction of recovered refrigerant (Japan will handle recovery and transport to the designated site in Dominica.)	In accordance with recipient government standards
f) Explanation to and securing of agreements from facility users	Before public announcement of bids for equipment and machinery
g) Provision of permit for installation of submerged-type FADs	Before public announcement of bids for equipment and machinery

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M. G.