Internal Ex-Post Evaluation for Grant Aid Project

conducted by Saint Lucia Office: January, 2023

Country Name	**the Project for Improvement of Fishery Equipment and Machinery in Antigua and Barbuda**
Antigua and Barbuda	

I. Project Outline

Background	In Antigua and Barbuda, the government was exploring the diversification of industries, which had relied on tourism, and one of them was to further develop fishery by effectively utilizing its own resources. Japan had contributed to the promotion of fishery through the provision of fisheries facilities and equipment through grant aid and technical cooperation. However, some of the fishery equipment provided had deteriorated due to aging, etc., resulting in a shortage of ice and fresh fish storage space. This led to not only distribution problems such as deterioration of freshness but also a reduction of fishing frequency. At the same time, in order to control overfishing in coastal waters, the government had been shifting from bottom fishery to offshore floating fisheries and had started using fish aggregating devices (FADs) to create offshore fishing grounds. However, it was facing many issues such as ensuring stable commercial fishing in offshore fishing grounds, developing underutilized resources and promoting their distribution, and monitoring illegal fishing.			
Objectives of the Project	This project aimed to improve fish distribution and to promote fishery management by upgrading part of the equipment developed under the past grant aid projects and related equipment at the four fisheries complexes (Point Wharf, Market Wharf, Parham, and Urlings) as well as by installing new equipment for fishery management, thereby contributing to the sustainable fishery development of the country.			
Contents of the Project	1. Project Site: Point Wharf and Market Wharf (St. John's), Parham (St. Peter's), Urlings and Mt. Obama (St. Mary's), Freetown (St. Philip's), Codrington (Barbuda), and Offshore. 2. Japanese side: Provision of grant necessary for the procurement of refrigeration equipment (3 locations),[1] air-conditioning equipment (1 location), water supply equipment (3 locations), submerged FADs (2 locations), radar system (5 locations), VHF radio system (1 location), an insulated truck, and a multipurpose boat. 3. Antigua and Barbuda side: Securing of permits related to the radar system and the radio system; sharing of radar images with the Coast Guard (i.e., purchase and installation of equipment required to enable data sharing); disposal of equipment and machinery after removal; destruction of recovered refrigerant; explanation to and securing of agreements from facility users; etc.			
Project Period	E/N Date	June 11, 2015	Completion Date	November 17, 2016 (Completion of installation of equipment)
	G/A Date	July 15, 2015		
Project Cost	E/N Grant Limit / G/A Grant Limit: 584 million yen, Actual Grant Amount: 554 million yen			
Executing Agency	Ministry of Agriculture, Lands, Fisheries and Barbuda Affairs (MALFB)			
Contracted Agencies	Main Contractor(s): NITTOSEIKO Co., Ltd. Main Consultant(s): OAFIC Co., Ltd.			

II. Result of the Evaluation

<Constraints on Evaluation>

・ Due to COVID-19, both Antigua and Barbuda and Japanese sides faced the difficulty in usual communication filling out the questionnaire as well as carrying out the projects site visits. Following travel restrictions, quarantine measures and work from home policy, it took extra months to complete the survey. As a result, JICA St. Lucia Office contracted the Caribbean Regional Fisheries Mechanism (CRFM) to support the office in implementing a smooth evaluation process. This evaluation report is a result reflecting such constraints and limited site visits.

1 Relevance

<Consistency with the Development Policy of Antigua and Barbuda at the Time of Ex-Ante Evaluation>

At the time of ex-ante evaluation, the project was consistent with the development policies of Antigua and Barbuda as the government was tackling sustainable fishery development through the Fisheries Development Strategy 2011-2015, a five-year plan for fisheries development. The plan includes the development goals of (1) Preparation of a comprehensive Fisheries Management Plan, (2) Utilization of under-exploited species, (3) Infrastructure development (fishery complexes and hurricane shelters), (4) Revision of fisheries legislation, and (5) Development of National Plan of Action to Address the Illegal, Unreported and Unregulated (IUU).

<Consistency with the Development Needs of Antigua and Barbuda at the Time of Ex-Ante Evaluation>

At the time of ex-ante evaluation, there was a need to improve fish distribution and fishery management promotion, as mentioned in "Background" above.

<Consistency with Japan's ODA Policy at the Time of Ex-Ante Evaluation>

Fisheries was one of the two priority areas of Japan's assistance for Antigua and Barbuda in 2015. Japan aimed to continue to cooperate for sustainable development and management of the fisheries industry for diversification of industries.[2]

<Evaluation Result>

In light of the above, the relevance of the project is high.

2 Effectiveness/Impact

[1] The refrigerant was converted from R22 (one of hydrochlorofluorocarbons: HCFC) to R404a (one of hydrofluorocarbons: HFC) except for Point Wharf, where the existing refrigerating system was still in good condition. The Montreal Protocol on Substances that Deplete the Ozone Layer was designed to phase-out or to reduce the production and consumption of HCFC to zero by 2030 for developing countries; the target for HFC was undetermined as of 2014. It was desirable to select natural refrigerant (e.g., ammonia) having less impact on ozone depletion and global warming. However, since there was a technical difficulty involved with handling ammonia, which was not widely available in the country, the executing agency wished to switch to R-404a.

[2] Ministry of Foreign Affairs, ODA Data Collection (2015)

<Effectiveness>

The project's objective, namely, "to improve fish distribution and to promote fishery management," was partially achieved in the target year (2019). Among the five quantitative indicators, the achievement of Indicators a, c, d, and e was limited, and Indicator b was not verifiable. However, many of the expected qualitative effects have manifested.

Regarding the improvement of fish distribution, the refrigeration equipment procured under this project has been in operation in all three target fisheries complexes. Ice sales (Indicator a) data for all these sites were available only for the target year, 2019, with actual results for that year being slightly less than half of the target level. In other years, the available performance data were also below the target for the respective sites. The Fisheries Division of the MALFB, the executing agency, explained the reason as follows. First, drought conditions caused the unavailability of water for making ice. Second, the late disbursement of monies from the Treasury to address routine maintenance resulted in more frequent breakdowns of the equipment. Third, there is competition from a private supplier supplying ice at more convenient hours and with mobility using a refrigerated truck. Forth, at Urlings, a significant portion of the fleet is comprised of dive boats targeting queen conch (Strombus gigas) and, to a lesser extent, live Caribbean spiny lobster (Panulirus argus). In this case , ice is not required; ice is detrimental to the survival of live lobsters, and queen conch can survive out of water for extended periods. In addition, the amount of ice being sold is less than before this project because, with the older system, plate ice that is heavier was used while the crushed ice is sold now. Nevertheless, it was confirmed that the freshness of fishery products has improved due to the greater use of ice in fishing operations post-2016. For example, the percentage of finfish trips using ice increased from 86% in 2015 to 93% and 98% in 2018 and 2019, respectively. In 2020, the percentage was 86% as cases of COVID-19 amongst staff resulted in closures of various ice plants. Also, the COVID-19 pandemic caused more nearshore operation due to the limited fishing time. Therefore, fish were still fresh. In addition, and there was less demand given the closure of hotels, etc. In sum, the fishing operations were downscaled; therefore, there was less demand for ice, but the product freshness improved.

Regarding the promotion of fishery management, the project's submerged FADs have been in use. The total number of fishing boats that entered the submerged FADs per annum (Indicator b) cannot be directly compared with the target value because the units are different between the target and actual values (vessel-trip and vessel-day, respectively; see the note under the table below). Also, some FADs were not in full operation at all times, and this accounted for the decreased number of fishing days in 2019. Nevertheless, certain utilization has been constantly made, and it has promoted fishery management, which had also been supported by the Caribbean Fisheries Co-Management Project (JICA technical cooperation project known as the CARIFICO project, 2013-2018). Under the CARIFICO Project, a co-management governance structure for the moored FAD fishery was facilitated with the formation of the Antigua and Barbuda FAD Fishers Association under the Friendly Societies Act in 2017. This allowed for greater input and understanding of fisheries management decisions and devolution in terms of fisheries governance.

The effects of the equipment for monitoring and surveillance for fishery management are limited. Among related quantitative indicators, annual operating days of the multipurpose boat (Indicator c) and the total number of detections of assumed illegal vessels per annum (Indicator d) have been almost zero, and the number of annual operating days of the surveillance radar (Indicator e) has been 51-57% of the target. According to the Fisheries Division, problems with the multipurpose boat include that the cruising speed (approx. 6 knots; maximum of approx. 8 knots) does not support traveling more than a few miles from the port. Also, the high noise level causes in communication issues between the captain and crew as well as headaches. These issues have resulted in fisher-folks refusing to accompany Fisheries Division on training or exploratory fishing exercises. As for the radar system and the radio system, there are connectivity issues and the inability to detect small fishing vessels without a radar reflector installed on vessels. These issues were discussed with the contractors during the initial phase of operation and the review after one year, and technicians were sent to check the system and make adjustments to the devices. The communication systems between the two sites in Antigua are functional but not in Barbuda due to the physical damage caused by Hurricane Irma in August 2017. Under such situations, it was not practical for the Fisheries Division to have the radar operating all the time. The radar is turned on when necessary.

<Impact>

The expected impact of this project, namely, "contribution to the sustainable fishery development," has manifested. The Fisheries Division acknowledged the following positive impacts. First, as mentioned above, the refrigeration equipment has enhanced the safety and quality control of seafood. Second, the human resource development of fishers has been enhanced regarding gear construction, deployment, and maintenance, as well as fishing techniques. Local FAD fishers have been modifying the original design of the FADs and are now sharing their knowledge in FAD design, construction, and utilization with fishers in Barbuda and Montserrat. Third, fishery management in the areas of monitoring, control, and surveillance has been improved to some extent, although the radar system did not function as intended, e.g., the use of the fisheries monitoring center in the Fisheries Division. Fourth, data collection has been improved to better guide decision-making. Employees at the Urlings and Parham Fisheries Complexes[3] with the ice production are responsible for collecting data from fishers. These catch and effort data and biological data can be validated via independent surveys and to inform stock assessments. Validation of these types of data was done in 2017/18, and the multipurpose boat was useful for this in the South of the island.

The Fisheries Division also pointed out a positive impact on gender: as authorized fishers, female captains, crews, and fish vendors benefited from improved access to affordable ice, thereby enhancing the quality of fish sold or processed. No adverse impacts were observed.

<Evaluation Result>

Therefore, the effectiveness/impact of the project is fair.

Quantitative Effects

Indicators	Baseline 2014 Baseline Year	Target 2019 3 Years after Completion	Actual 2017 1 Year after Completion	Actual 2018 2 Years after Completion	Actual 2019 3 Years after Completion	Actual 2020 4 Years after Completion
Indicator a: Annual ice sales (Total	1,140	2,000	671	766	927	707

[3] At Market Wharf Fisheries Complex, Antigua Fisheries Limited (AFL), a statutory body that is outsourced the operation, has their own arrangement for data collection.

volume of Market Wharf, Parham, and Urlings) (ton/year) [1]			(2 locations only)	(2 locations only)	(All 3 locations)	(2 locations only)
Indicator b: Total number of fishing boats entered the submerged-type FADs per annum (vessel-trip) [2]	0	700	N.A.	N.A.	N.A.	N.A.
(Reference) Total number of fishing boats entered the submerged-type FADs (vessel-day) [3]	-	-	1,092	1,326	390	N.A.
Indicator c: Annual operating days of the multipurpose boat [4]	0	140	7	16	1	N.A.
Indicator d: Total number of detections of the assumed illegal vessels per annum [5]	0	200	0	0	0	N.A.
Indicator e: Annual operating days of Surveillance radar [6]	0	350	180	220	200	N.A.

Source: Ex-ante Evaluation Report; Fisheries Division

Note: (1) For Indicator a, the target value was estimated as the total amount of ice production from new ice-making equipment to be installed at each site. The actual figures for the years except 2019, the target year, are the sum of Market Wharf and Urlings, as data for Parham is not available.

(2) For Indicator b, the target value was estimated as 82 vessels with FAD license (22 registered vessels at the time of planning + 60 new vessels) x 9 trips/year (based on Dominican data) = 738. The unit is vessel-trip.

(3) For reference related to Indicator b, the values were estimated by 15 vessels x 1.4, 1.7, or 0.5 day/week (in 2017, 2018, and 2019, respectively) x 52 weeks. The unit is vessel-day. The values include the number of fishing boats operating around the two FADs installed by this project and smaller FADs deployed under the JICA CARIFICO Project.

(4) For Indicator c, the target value was estimated as 36 days for at-sea training, 44 days for FAD installation and monitoring, and 60 days for trial pot fishing.

(5) For Indicator d, the target value was estimated as 1,992t (fish reportedly caught by illegal vessels) ÷ 8.4t (fish catch per vessel) = 237 illegal vessels estimated to have operated (figures are all as of 2006). The project plan anticipated that there would be a possibility that the number of illegal vessel detections might be lower than the target by the effects of a deterrent through the operation of surveillance radar.

(6) For Indicator e, the target value was estimated as 365 days minus 15 days for maintenance and inspection.

3 Efficiency

Both the project cost and the project period were within the plan (ratio against the plan: 95% and 94%, respectively). The outputs were produced as planned. Therefore, the efficiency of the project is high.

The sharing of images of illegal fishing boats detected by the Fisheries Division with the Coast Guard, one of the planned undertakings of the Antigua and Barbuda side, has not been carried out as the Coast Guard has not prepared the necessary infrastructure (e.g., optical fiber). While this has affected the maximization of the effects of this project, it shall not be treated as a factor that reduces efficiency since it does not affect the functioning of the radar system itself.

4 Sustainability

<Institutional/Organizational Aspect>

There is an organizational structure for operation and maintenance (O&M) of each of the equipment procured by this project. For the refrigerating system and water supply system, except for Market Wharf, the operation is carried out by each fishery complex under the Fisheries Division (around five staff members are assigned), and maintenance is carried out by maintenance staff (two staff members assigned) of the Fisheries Division. O&M of the equipment at Market Wharf is outsourced to Antigua Fisheries Limited (AFL), a statutory body dealing with seafood processing, marketing, and ice sales. For the submerged FADs, the Fisheries Division and fishers carry out O&M. For the multipurpose boat and the surveillance radar system, the Fisheries Division carries out O&M. For the radio system, O&M is carried out by Parham Fisheries Complex, where the system is installed. According to the Fisheries Division, there is enough staff to properly conduct their O&M responsibilities respectively.

<Technical Aspect>

The technical level for O&M at the time of the ex-post evaluation for the facilities of the fisheries complexes, FADs, the multipurpose boat, and surveillance radar system was considered to be sufficient, as confirmed by the Fisheries Division. For the refrigerating system, the Senior Maintenance Officer has previous training in refrigeration and electrical engineering, and both maintenance officers would have completed training in Japan in refrigeration. For the water supply system, assistance from the Public Works Department is available. For the surveillance radar system, maintenance support from Antigua Public Utilities Authority (APUA) is available. As for the training mechanism, the Fisheries Division has partnered with the Antigua and Barbuda Institute for Continuing Education (ABICE) in the Work Experience Training program for students enrolled in the Refrigeration Department. The Fisheries Division received two trainees in 2021. An issue is that the remuneration packages offered by the private sector for skilled technicians are usually more attractive than that offered by the Fisheries Division/Government, so it is usually difficult to retain the technicians in the Fisheries Division/Government system.

<Financial Aspect>

The Fisheries Division acknowledged that the O&M budget was not enough; what is allocated in the approved budget is normally less than what is requested in budget submission to properly support O&M. The Fisheries Division also gave information that there is an issue of the late disbursement by the Treasury for the purchase of material/parts required for O&M. Though the budget is insufficient, a minimum budget seems to be secured to operate facilities and equipment as far as observed at the project sites. The concrete budget data was not available.

<Current Status of Operation and Maintenance>

The project's equipment is mostly operated with breakdowns and repairs; however, maintenance is not always at the scheduled time due to late payment from the Treasury. The issues at the time of the ex-post evaluation include the refrigeration equipment at Market Wharf (the condition of the compressor is poor, and assistance is being sought for an upgrade), the submerged FADs (the surface markers were lost), and the surveillance radar system at Codrington (Barbuda) (not in use due to a destruction of the microwave communication antenna by Hurricane

Irma).

<Evaluation Result>

In light of the above, some problems have been observed in terms of the financial aspects and the current status of the operation and maintenance system. Therefore, the sustainability of the project effect is fair.

5 Summary of the Evaluation

The project partially achieved the objective of improving fish distribution and promoting fishery management as the freshness of fish improved by using the refrigerating equipment and offshore fishing increased utilizing the submerged FADs, although the performance did not reach the targeted level quantitatively, and some equipment was not utilized as expected. Regarding sustainability, some problems were found in the financial aspect and the status of some equipment due to insufficient budget and slow disbursement for O&M. However, no problems were found in the institutional/organizational and technical aspects. Also, both the project cost and the project period were within the plan, and thus the efficiency of project implementation is high. Considering all of the above points, this project is evaluated to be satisfactory.

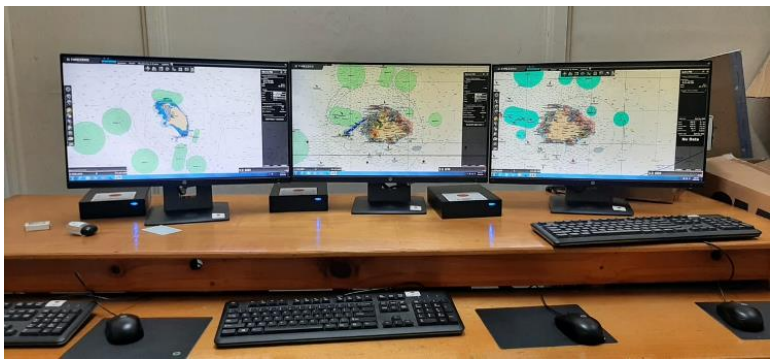
III. Recommendations & Lessons Learned

Recommendations to the Executing Agency:

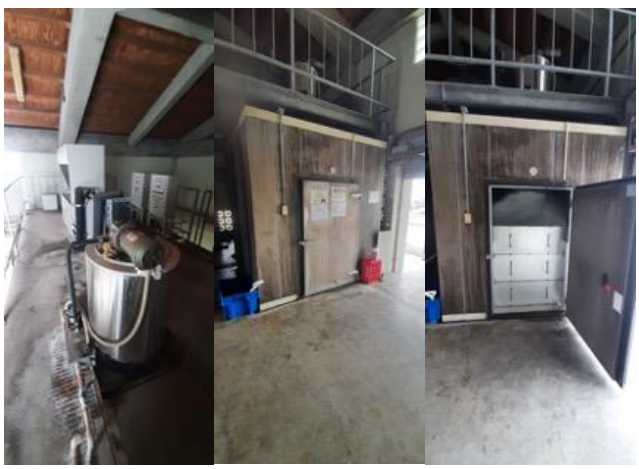
- There is a downtime of the ice plants at Market Wharf, Parham, and Urlings Fisheries Complexes – late disbursement of monies from the Treasury to address routine maintenance resulted in more frequent breakdowns. The Fisheries Division is recommended to continue advocating for the disbursement of funds to address routine maintenance.
- The ice machines, the multipurpose boat, FADs, and radar system are not used as expected. The equipment was procured based on needs surveys conducted by JICA, but on the ground, realities and challenges have limited the full use of this equipment. In order to determine how best to utilize the equipment under the current conditions would require stakeholders' engagement and technical expertise to determine feasible options. Thus, the Fisheries Division is recommended to initiate such activities to improve equipment utilization.
- The Fisheries Division is encouraged to continue to adopt the co-management approach on the development of FAD fisheries between fishers and the Fisheries Division for the sustainable use of fishery resources through FADs, including those procured under this project.

Lessons Learned for JICA:

- FAD fishers have improved upon their techniques for the harvesting of pelagic fish to the point where they have been able to share their knowledge in FAD design, construction, and utilization with fishers in Barbuda and Montserrat. When introducing FAD fishing, the installation of FADs could go with the introduction of the collaborative co-management approach regarding the development of FAD fisheries with fishers and the Fisheries Division.
- The establishment of the Antigua and Barbuda FAD Fisheries Association under the CARIFICO project is a promoting factor for the utilization of the submerged FADs through the enhancement of fisheries governance and. This is a good example of collaboration between a grant aid project and a technical cooperation project for institution building, which not only promoted the use of procured equipment, but also increased the sustainability of the institution where sharing of knowledge and experience gained through the use of the equipment was established.
- The cruising speed of the multipurpose boat does not support traveling more than a few miles from the port. The boat also appears to be improperly trimmed and underpowered, which results in inefficient operation in the water. The boat is also noisy, which interrupts communication between the captain and crew. The multipurpose boat was intended to be used for at-sea training for fishers, installation, monitoring, and maintenance of FADs, and surveys of reef fish and lobster catch. Field validation and trials using the boat should have been done to ensure that it would fit for purpose and to allow necessary adjustments in the design.
- Connectivity issues resulted in a lack of data transmission between the radar sites up until the third quarter of 2017. By the time the technicians had addressed the issue, the radar units had to be replaced. The communication sites on Antigua are functional; however, the one on Barbuda was damaged by Hurricane Irma. Additionally, the radar system is unable to detect small fishing vessels. The surveillance radar system was intended to be an effective tool for conducting efficient coastal and offshore surveillance and patrol activities as set out in the Antigua and Barbuda Plan of Action to Prevent, Deter and Eliminate IUU Fishing. Field validation and trials using the surveillance system should have been done to ensure that it would fit for purpose and that the system would capture the target small fishing vessels. The risk of natural disasters such as hurricanes also needs to be taken into account when designing.



Fisheries monitoring system (monitoring station equipment of the radar surveillance system) at Fisheries Division



Ice machine, ice storage, and ice inside at Urlings Fisheries Complex