

Country Name	The Project for Improvement of Fishery Equipment and Machinery
Saint Lucia	

I. Project Outline

Background	The fisheries industry is an important industry of Saint Lucia besides tourism and agriculture. However, the reduction of coastal marine resources due to overfishing in the entire Caribbean region, including Saint Lucia, had become an issue. The Caribbean Community (CARICOM) had established the Caribbean Regional Fisheries Mechanism (CRFM) in March 2003, and CRFM had begun activities aimed at managing fisheries resources throughout the region. For sustainable use of fishery resources, it was important to introduce resource-management fisheries to reduce fishing pressure in coastal areas and distribute fishery products to the maximum without loss. However, another issue in Saint Lucia was the aging of main fishery equipment such as cooling equipment, most of which had been developed under the past Japanese grant aid projects. This problem would lead to distribution losses due to the deterioration of the freshness of landed fish.		
Objectives of the Project	To improve fish distribution and to promote fishery management by upgrading part of equipment developed under the past grant aid projects and related equipment at the five fisheries centers (fisheries complexes) as well as by installing new equipment for fishery management, thereby contributing to the sustainable fishery development of the country.		
Contents of the Project	<ol style="list-style-type: none"> 1. Project Site: Vieux Fort Quarter, Dennery Quarter, Castries Quarter, Ans La Raye Quarter, Gros Islet Quarter, and Offshore. 2. Japanese side: Provision of grant necessary for the procurement of refrigerating system/ice plants (ice machines, cold storages, blast freezers, etc. with the conversion of refrigerant from HCFC to ammonia following the Montreal Protocol¹) (five locations with varied subcomponents), refrigerated vans (1 site), solar power system (1 site), subsidiary works on some facilities, and floating submerged fish aggregating devices (FADs) (2 offshore locations). 3. Saint Lucia side: Removal and storage of cylinders filled with waste refrigerant, dismantling of existing equipment/materials to the outside, etc. 		
Project Period	E/N Date	September 4, 2014	Completion Date May 27, 2016 (Completion of installation of equipment)
	G/A Date	September 19, 2014	
Project Cost	E/N Grant Limit / G/A Grant Limit: 560 million yen, Actual Grant Amount: 493 million yen		
Executing Agency	Ministry of Agriculture, Food Production, Fisheries, Co-operatives and Rural Development		
Contracted Agencies	Main Contractor(s): NBK Corporation Main Consultant(s): System Science Consultants Inc.		

II. Result of the Evaluation

<Constraints on Evaluation>

- Due to the COVID-19, from the beginning of the survey both Saint Lucian and Japanese sides had to face and overcome the difficulty in usual communication filling out the questionnaire. It took extra months to complete the survey. A State of Emergency was issued, and the work from home was requested, as a result the opportunity for site visits was severely limited and postponed to the last moment. The evaluator visited one of the five sites at Castries. This evaluation report is a result reflecting such constraints and limited site visit.

<Special Perspectives Considered in the Ex-Post Evaluation>

- Indicator 1, "Ice/fish ratio," appears to have been set as a ratio between the amount of ice produced and the amount of fish landed. However, there are comments that a clear correlation between these two cannot be determined and that changes of ice/fish ratio over time are not meaningful. Therefore, this ex-post evaluation excluded this indicator from the basis for judging effectiveness. An attempt was made to check ice sales volume as an alternative indicator, but the data was not available.
- Since the data for Indicator 2, "Registered number of fishermen operating at the point of submerged FAD as their fishing ground (persons/year)," was not available, the actual values were estimated using the estimated number of fishing vessels that are known to engage in fishing at FAD and the number of trips made by these vessels per week.

1 Relevance

<Consistency with the Development Policy of Saint Lucia at the Time of Ex-Ante Evaluation>

At the time of ex-ante evaluation, the project was consistent with the National Fisheries Plan 2013 with its target year of 2020, formulated following CARICOM's development guide. The basic vision of the Plan is "to promote sustainable fisheries industry by a public-private partnership, to strengthen profitability and to contribute to food security."

<Consistency with the Development Needs of Saint Lucia 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>

In the Country Assistance Policy for Saint Lucia (April 2014), fisheries is one of the two priority areas of Japanese assistance.

<Evaluation Result>

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

¹ The Montreal Protocol on Substances that Deplete the Ozone Layer is designed to phase-out or to reduce the production and consumption of hydrochlorofluorocarbons (HCFC) (R22 & etc.) as well as hydrofluorocarbons (HFC) (R404a & etc.). The target is HCFC to zero by 2030 for developing countries; the target for HFC was undetermined as of 2014.

2 Effectiveness/Impact

<Effectiveness>

The project's objective, namely, "improve fish distribution and to promote fishery management," was achieved. Regarding the quantitative effects, although the ice/fish ratio (Indicator 1) achieved the target, this indicator is excluded from the evaluation judgment as described in "Special Perspectives Considered in the Ex-Post Evaluation" above. Regarding the operation status of the facilities at the time of ex-post evaluation in 2020, the Department of Fisheries, in charge of this project in the executing agency, reported that the ice machine in Dennery stopped functioning in 2019 due to a breakdown. At the other four locations, the installed machines were all in use, while needs for some repairs due to heavy use were reported.² The number of registered fishers operating at the point of the submerged FADs as their fishing ground (Indicator 2) was estimated at 450, which is almost at the target value of 500, in 2019. Noting that there was a high exchange of crew and part-time employment, it is expected that over 50 registered fishers would have additionally engaged in fishing as crew on these vessels. At the time of ex-post evaluation, the submerged FADs were in use while a repair was needed.³

Regarding the qualitative effects, the fish distribution was improved. The Department of Fisheries commented that the cooling equipment and refrigerated vans procured under this project enabled to maintain the cold chain for fish. Moreover, end-users of the ice (fishers and vendors) were satisfied with the outputs as they had ice for preservation of their catch before and after fishing trips as well as storage. As for fishing management, the Department of Fisheries developed a FAD fisheries management plan in collaboration with fishers and other key stakeholders. The plan articulates that fishing techniques and gear options used around a FAD should reduce the catch of juvenile fish and species with catch restrictions established. The introduction of drop-line fishing technique around the submerged FADs has increased bigger size catch that reduce the motivation for catching smaller and juvenile fish considered less productive, less valuable in comparison to bigger fish. Such an improvement was made possible through the usage of this project's facilities/equipment and also with the contribution of the Caribbean Fisheries Co-Management Project (2013–2018), a JICA technical cooperation project that further enhanced fishery management through cooperation and face-to-face advice by the Japanese experts.⁴ Human resources whose capacity was developed through the technical cooperation project and this grant aid project mutually assisted the achievement of the expected outcome.

<Impact>

The expected impact of this project, namely, "Contribution to the sustainable fishery development," was manifested. Regarding fish distribution, there was a positive impact on the food value chain and cold chain in Saint Lucia, according to a Japanese fisheries expert. Namely, the majority of the country's catch has been landed in Vieux Fort and Dennery and has been frozen and distributed for sale to major consumers in Castries. Such a distribution channel of freezing the catch in the southern part of the country and selling it in the northwestern part of the country, where it is consumed, has become a model for frozen fish distribution in the Eastern Caribbean region. This model is maintained and functioning through the refrigerating equipment procured by this project. As for impacts related to the promotion of managed fisheries include, specific changes pointed out by the Department of Fisheries include 1) optimized fishers' fishing efforts because the FADs as an aggregator have assisted fishers in saving time, fuel cost and assured a sixty to eighty percent chance of a catch on a fishing expedition; 2) landings of larger fish such as Large tuna and Blue marlin; 3) rejuvenation and less pressure on nearshore fisheries resources, e.g., reef fish; and 4) information and data required from international donor agencies and other regional and international monitoring agencies (e.g., fish catches) being easier to collect and provide to such agencies with the advent of the FADs, allowing the Department of Fisheries not to miss out on much-needed funding and technical support.

According to the Department of Fisheries, the project did not only benefit the initial target group (fishers) but also the wider communities. Easier/direct access and availability of ice for sale enabled the continuation of Fish Friday events, where local communities use ice not only to keep fish fresh but also to offer cold drinks, make cocktails, etc. As women predominantly take up fish Friday activities, the project contributed to households' socio-economic status through enhancing women's economic activities. No adverse impacts were observed.

<Evaluation Result>

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

Quantitative Effects

Indicators	Baseline 2014	Target 2019	Actual 2017	Actual 2018	Actual 2019
	Baseline Year	3 Years after Completion	1 Year after Completion	2 Years after Completion	3 Years after Completion
Indicator 1: Ice/fish ratio ⁽¹⁾	3.31–8.31	3.31–8.31 or higher	3.0–5.0 (Average: 3.8)	3.0–5.0 (Average: 4.8)	3.0–6.0 (Average: 4.4)
Indicator 2: Registered number of fishers operating at the point of submerged FAD as their fishing ground (persons/year) ⁽²⁾	0	500	300	450	450

Source: Ex-ante Evaluation Report; Department of Fisheries

Note: (1) For Indicator 1, the Ex-ante Evaluation Report does not specify the unit of value. Also, the ground for the calculation of the baseline and target

² According to the Department of Fisheries, the ice making machine in Dennery had been facing some problems from inception that was attributed to water quality issues. At the time of ex-post evaluation, the machine was non-functional over one year with the pipes corroded, oil being migrated from the compressor, and the water pump on the evaporative condenser was nonfunctional. At Vieux Fort, a half of the refrigerating system was operational with the other half facing some problems such as gas leakage from corroded pipes. At Anse La Raye, the freezing system was operational but the condenser was ending its lifespan by heavy utilization. At Gros Islet, the ice plant was operational but spare parts replacement was needed. Information on plans for future repairs was not available.

³ The FADs needed a repair of the marker buoys damaged by a barge in May 2020. Information on plans for future repairs was not available.

⁴ Japanese experts made advice particularly on such issues as operation and maintenance of ice-making machine, good practice of FAD fishing, distribution of fish and the products and so on. As a result of such technical advice, fishery management was improved especially in such aspect as decreased down-time of the ice-making machine, improvement in fish catch management, promotion of fish-based meal and so on.

figures is not mentioned. Considering the numerical scale of the numbers 3.31 and 8.31 and the statement in the Preparatory Survey Report that the ice/fish ratio could be calculated based on the amount of ice produced and the amount of fish landed, the baseline and target figures seem to be the amount of fish landed (in weight) per unit of ice production (in weight). For the actual values, accordingly, we obtained the weight of fish (lb) per 1 lb of ice produced so that they could be compared to the target values. The range of values represents the sites with the smallest and largest values, and the average value represents the arithmetic mean of the values for each site. (2) For Indicator 2, the number of registered fishers operating at the FADs was estimated by multiplying the number of vessels known to be operating there (100 vessels in 2017 and 150 vessels in 2018 and 2019) by the average number of registered fishers per vessel (3 persons). It is reported that these vessels operate five days per week.

3 Efficiency

While the project cost was within the plan, the project period exceeded the plan (ratio against the plan: 88% and 124%, respectively). The project implementation was delayed mainly due to a delay in bidding. Therefore, the efficiency of the project is fair.

4 Sustainability

<Institutional/Organizational Aspect>

The Department of Fisheries is responsible for overseeing fishery centers and operation and maintenance (O&M) of the FADs. For the refrigerating system/ice plants, a fisherfolk cooperative with a hired operator for maintenance is responsible for each facility in Ans La Raye and Gros Islet, and a private company Lucian Blue Ocean Seafood Ltd., with a maintenance and service technician, are responsible for the facilities in Castries, Dennery, and Vieux Fort. Lucian Blue Ocean Seafood Ltd. has taken over the management of cold storage and fish processing facilities of the mentioned sites from Saint Lucia Fish Marketing Corporation (the would-be O&M agency) through a public-private sector partnership aimed at enhancing the management and operation of the facility. The site visit to Castries found that the company was in good coordination with the Government.

An issue is that at the Department of Fisheries, no staff member is assigned for service and maintenance, but six extension officers serve as liaisons. If greater assistance than what the Department can handle is required, engineers from the Ministry of Infrastructure provide support. Job analysis of current staffing positions shows that it is not with scope to conduct these duties of O&M effectively. The Department is exploring the establishment of a management committee that will bring together expertise from a cross-section of government agencies/fishing port authorities to support O&M.

<Technical Aspect>

In the survey result by the Department of Fisheries, two-issues were repeatedly mentioned: a) inconvenience caused by the breakdown period of the machine, and b) lack of capacity for maintenance and repairs. According to the Department, there is no training system to enhance or maintain the technical capacity. On the other hand, through discussions with fisherfolks and site visits, it was identified that the facilities were utilized with continuous maintenance efforts to operate the equipment, especially ice-making machines.

<Financial Aspect>

At each facility, the source of the O&M budget was operations revenue including sales of ice. Some examples of O&M spending for which information was available are EC\$250/month and EC\$300/month of O&M budget being allocated at Ans La Raye and Gros Islet, respectively. According to the Department of Fisheries, limited funding was due to other expenses of the fishery centers. The Department also shared that efforts would be made to support fisherfolk cooperatives to prepare maintenance schedules/plans and annual budgets to increase allocation and improve the O&M system in collaboration with key stakeholders.

<Current Status of Operation and Maintenance>

At the time of this survey, some facilities were facing maintenance issues, as already mentioned. However, each case was reported to the Department of Fisheries. In most cases, necessary spare parts were procured, and the hired operators for maintenance were arranged. Considering the good usage and maintenance for most fishing complexes as well as the effort for maintenance where the trouble exists, it is concluded that the sustainability is at a reasonably good level with the hope for further maintenance.

<Evaluation Result>

In light of the above, some problems have been observed in terms of the institutional/organizational, technical, and 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 achieved the objective of improving fish distribution and promoting fishery management as indicated by the operation of the installed machines at most of the sites and the number of fishers operating at the submerged FADs. Regarding the sustainability, some problems are found in the institutional/organizational, technical, and financial aspects and the current status of the O&M of the cold facilities as the organizational system, budget, and technical capability to handle frequent breakdown have been limited. However, it is commendable that the Department of Fisheries and the operation and maintenance agency of each facility are handling the problems as best they can and keeping most of the equipment in operation. As for the efficiency, the project period exceeded the plan. Considering all of the above points, this project is evaluated to be satisfactory.

III. Recommendations & Lessons Learned

Recommendations to the Executing Agency:

- The Department of Fisheries can take some measures one by one to ensure sustainability, mostly in funding and human capacity development. Regarding the latter, O&M capacity development is required, especially in relation to the refrigerating system and ice-making machines. It is ideal if the capacity-building opportunity is made available to not only fisherfolks cooperatives but also the

private sector Lucian Blue Ocean.

- By developing the capacity of the private sector and promoting public-private partnership, it is expected that the private sector can diversify and develop the income generation and cleaner environment (such as through enlarged export with HACCP certificate and processing of fish waste into fertilizers or fish meals) in addition to improving O&M of the procured facilities and equipment.

Lessons Learned for JICA:

- The project did not only benefit the initial target group fishers. However, it has benefitted the wider communities through easier/direct access and availability of ice made by the facilities for sale, contributing to the existence of the Fish Friday activities. The project was able to influence the continuation of Fish Friday activities, which are predominantly taken up by women, contributed significantly to the socio-economical status of households (including the enhancement of the role of women that is often marginalized in the fisheries sector) and also impacting on the increase of fish sales for fishers. Upgrading of the Anse La Raye waterfront and vendors arcade also impacted the sale of ice, noting that the activities are viewed worldwide through the advertisement of tourism attractions in Saint Lucia. The fishing community is also being promoted and visited as part of tour packages. The tourism sector is the main income generator for Saint Lucia, and Anse La Raye followed by Gros Islet has been benefitted from the tourism. In this way, this project supports the livelihood of small-scale entrepreneurs/self-employed women who are involved in the sale of artifacts and local craft, which has empowered them. These effects were unanticipated positive impacts of this project. Still, it is a good idea to recognize that such gender and income improvement impacts can be expected in future fisheries equipment improvement projects and to develop project plans that clearly aim to achieve these goals.
- Projects to improve fish distribution in the Eastern Caribbean can learn from this project as Saint Lucia is a model of frozen fish distribution in the area. In other words, to improve the fish distribution in the Caribbean region, it will be effective to support the maintenance of the functioning of the refrigerating systems at the landing and consumption centers of the catch.



The replaced door of a freezer (Castries)



In the refrigeration facility (Castries)



The fisheries complex supports local producers, selling local agricultural products in addition to seafood (Castries)