Internal Ex-Post Evaluation for Technical Cooperation Project

conducted by Cuba Office: November 2021

Country Name	Project for Fish Culture in the Republic of Cuba
Republic of Cuba	

I. Project Outline

Background	Aquaculture was playing an increasingly important role in the Cuban fisheries industry due to a sharp drop in fish catches. Approximately 30,000 tons of fish were farmed each year, accounting for about a half of all fisheries production in the country. The Ministry of the Fishing Industry (MIP) was working on the development of aquaculture technology for native marine fish at the Fisheries Research Center (CIP) through the technical cooperation of "Japan-Chile Partnership Programme[1] (JCPP)", "Marine Fish Culture". While having made it possible to rear broodstock independently, it had yet to reach the stages of spawning and hatching on its own. For this reason, the government of Cuba requested the government of Japan technical cooperation to promote marine fish culture by introducing further new technologies.		
Objectives of the Project	Through the rehabilitation of the facilities, seed production activities of Robalo and Pargo, development of the manual, training of the staff, the project aimed at strengthening the capacity of Robalo and Pargo culture in the Research Affiliate of Santa Cruz del Sur (SCS), thereby contributing to the government's operation of the fish culture of Pargo. 1. Overall Goal: Government of Cuba runs the fish culture of Pargo. 2. Project Purpose: Capacity of Robalo and Pargo culture in the SCS is strengthened.		
Activities of the project	1. Project site: Santa Cruz del Sur. 2. Main activities: Review of the past aquaculture activities at SCS, rehabilitation of the facilities, aquaculture activities for seed production of Pargo and Robalo, development of the manual, training of SCS staff, etc. 3. Inputs (to carry out above activities) Japanese Side 1) Experts from Japan: 5 persons 2) Training in Japan: 1 person 3) Training in the third country (Mexico): 2 persons 4) Equipment: PVC pipes, sand filters, pumps, blowers, autoclaves, microscopes, vehicles, etc. 5) Local cost: Construction of the new research facility, etc. Cuban Side 1) Staff allocated: 36 persons 2) Land and facilities: Office space, CIP facility, etc. 3) Local cost: Electricity, communication, freshwater transportation, food for the broodstock, etc.		
Project Period	(ex-ante) May 2008 to May 2013 (actual) May 2008 to November 2014 (Extension period: May 2013 to November 2014)	Project Cost	(ex-ante) 175 million yen, (actual) 259 million yen
Implementing Agency	Ministry of the Food Industry (MINAL) (restructured from the Ministry of the Fishing Industry in 2009), Fisheries Research Center (CIP)		
Cooperation Agency in Japan	None.		
Related Project	Technical cooperation: "Marine Fish Culture" (part of the Japan-Chile Partnership Programme) (2000-2001) Other donors' cooperation: "Development of sustainable marine aquaculture in Cuba" (2011-2016) by Norwegian Agency for Development Cooperation (The objective of the project was to increase the indigenous production of marine fish in Cuba.		

II. Result of the Evaluation

< Special Perspectives Considered in the Ex-Post Evaluation >

[Continuation Status of the Project Effects]

- Indicator 2 of the Project Purpose (preparation and presentation of the report and proposal) was not used for verification of the continuity of the project effects at the time of the ex-post evaluation, but it was confirmed whether the technology proposed has been utilized.

1 Relevance

<Consistency with the Development Policy of Cuba at the time of Ex-ante Evaluation>

The MIP had been involved in a development plan to increase national aquaculture production in fresh and salt water though the detail of the plan, such as the name of the plan was not specified. As to marine aquaculture, the development of acquaculture rechnology was one of the main targets. Thus, the project was consistent with the development policy of Cuba at the time of ex-ante evaluation.

<Consistency with the Development Needs of Cuba at the time of Ex-ante Evaluation>

Aquaculture was playing an increasingly important role in the Cuban fisheries industry due to a sharp drop in fish catches. Although CIP was able to rear broodstocks as the results of the support through the JCPP, it did not have technologies to proceed to the spawning and hatching on its own. Thus, the project was consistent with the development needs of Cuba at the time of ex-ante evaluation.

<Consistency with Japan's ODA Policy at the time of Ex-ante Evaluation>

Based on the policy consultation with the Government of Cuba, priority areas for Japan's assistance were decided including the

[1] The agreement between Japan and Chile for working together on cooperation with other developing countries (so-called trilateral cooperation) concluded in June 1999. Thus far, third-country training and specialist dispatches to third countries have been implemented in fields such as disaster prevention and the environment, fisheries and medical care.

increase in food production[2]. Thus, the project was consistent with Japan's ODA policy at the time of ex-ante evaluation.
<Appropriateness of the project design/approach>
The project aimed at strengthening SCS's capacity of Robalo and Pargo culture. By acquiring techniques for seed production, induced maturation and spawning, SCS's researchers succeeded in the fry production, as targeted as the Project Purpose. However, the project effects lasted only a few years after the project completion. One of the factors for non-continuity of the project effect and non-achievement of the Overall Goal is that, technically, the scope of the project covered up to the fingerling production of Pargo and Robalo, but not to grow them to the commercial size fish, which made it difficult to develop the production cycle satisfying the producers' expectation for engaging in the cultivation of these species. Financially, there was no detailed study on the cost and benefit contemplated in the project activities to promote the establishment of seed production center. Also, it was necessary to keep on examining the project design during the project. Thus, it is judged that the project design and approach were partially appropriate.
<Evaluation Result>
In light of the above, the relevance of the project is fair.

2 Effectiveness/Impact

<Status of Achievement for the Project Purpose at the time of Project Completion>
The Project Purpose was achieved by the time of project completion. The technical staff of SCS acquired a high level of skills in the cultivation of Robalo and Pargo, in particular, fry production (Indicator 1), and the production increased more than planned (Indicator 3). The Project experiences were summarized as the "Guidebook of Artificial Seed Production of Pargo and Robalo", and distributed to the related organizations including MINAL, Enterprise Group of the Food Industry, Provincial Government of Camaguey, JICA Mexico office, and so on. (Indicator 2).
<Continuation Status of Project Effects at the time of Ex-post Evaluation>
The project effects were not continued at the time of ex-post evaluation. SCS continued the fry production of Robalo and Pargo until 2016. It also sustained the feed production and the maintenance of microalegae strains until 2016, as well as fattening experiments and replacement banks (juvenile fish as future breeders) of both species. However, these activities were gradually ceased due to the following reasons. First, the live feed production became difficult due to the water contamination which was caused by the lack of periodical maintenance, disinfection of the equipment, and the lack of necessary reagents, despite the support from CIP in terms of some materials such as chlorine and alcohols. Second, SCS had difficulty in maintaining broodstock of both species, as the number of abnormal eggs per spawning increased and also the spawning frequency decreased over time. The replacement of broodstock was also difficult because it was not able to capture the matured fish from the natural environment because the fishing in some protected area was not allowed to use. Third, SCS could not obtain essential inputs sufficiently, such as hormones to induce spawning and vitamins for the live feed production. Fourth, regarding Robalo, it had technical difficulties in raising the broodstock due to its hermaphroditic nature.
Facilities and equipment rehabilitated by the project have been utilized for different purposes from the project intention, as follows. At the time of ex-post evaluation, the broodstock tank was in an acceptable condition and being used for rearing a broodstock of Red Tilapia, though the roof needed to be repaired. The seawater intake system was used until the beginning of 2021 for supplying seawater to the adjoining White Shrimp nursery area. The larvae rearing room and laboratory equipment were in a good condition and used for cultivating Red Tilapia and adapting it to the seawater. On the other hand, the building for feed production and water storage has not been used, because the water supply pipe was never disinfected due to the budget shortage to obtain necessary supplies for the disinfection.
<Status of Achievement for Overall Goal at the time of Ex-post Evaluation>
The Overall Goal has not been achieved by the time of ex-post evaluation. As described above, SCS has not continued the production of Pargo, and any other aquaculture center of Pargo has not been established, either. The following factors are considered as the reasons. First, although the establishment of an aquaculture center was recommended in the "Proposal of Implementing the Technology to the Productive Sector," it did not explain the economic feasibility of the center. In a situation where the budget was not abundant, no investment was made to establish and operate such a center. Second, the sale of fingerlings produced by SCS to the surrounding producers was not succeeded, because they belonged to the state-owned companies which did not conduct fish farming for a corporate purpose at that time. Although they were interested in raising the fingerlings using floating cages, SCS had not developed enough production techniques to demonstrate the production of Pargo and Robalo up to the commercial size by using the cages in the ocean.
<Other Impacts at the time of Ex-post Evaluation>
Several positive impacts have been confirmed. First, SCS succeeded in maturing the Pargo and Robalo broodstock raised from artificially fertilized eggs based on the project experience, though it has been stopped since 2017. Second, fingerlings of Pargo and Robalo were released in marine waters, which resulted in an activity for recovering the resources of these species, although the number was not significant. It aroused curiosity and interest to some extent among the fishing companies of the surrounding territories, according to SCS.
<Evaluation Result>
Therefore, the effectiveness/impact of the project is low.

Achievement of the Project Purpose and Overall Goal

Aim	Indicators	Results	
(Project Purpose) Capacity of Robalo and Pargo culture in SCS is strengthened.	1. The technical staff of the Santa Cruz del Sur affiliate executes the protocol for the cultivation of Robalo and Pargo, described in the manual prepared by the project.	Status of achievement: Achieved (Not continued). (Project Completion) - The technical staff of SCS acquired a high level of skills in the cultivation of Robalo and Pargo based on the manual prepared by the project, according to the JICA expert's observation.	Source: Project Completion Report.
		(Ex-post Evaluation) - SCS has stopped the cultivation of Robalo and Pargo since 2017, due to the contamination of water for live feed production, the lack of broodstock, and the lack of essential inputs such as hormones and vitamins.	Source: SCS.

[2] Ministry of Foreign Affairs ODA Databook (2009)

<table>
<tr><td></td><td>2. The final technical report of the project results and the proposal for the implementation of the technology in the productive sector are prepared by CIP and presented to MINAL.</td><td>Status of achievement: Achieved (Not continued).
(Project Completion)
- The results of the project were summarized as a manual and presented to MINAL and other stakeholders.
- The proposal for the implementation of the technology was prepared.</td><td>Source: Project Completion Report.</td></tr>
<tr><td></td><td></td><td>(Ex-post Evaluation)
- The fingerling production using the technology developed by the project has been discontinued.
- The proposal for the implementation of the technology in the productive sector has not been adopted.</td><td>Source: SCS.</td></tr>
<tr><td></td><td>3. From the hatched larvae, more than 15,000 Pargo fries are obtained with an average length of 3 cm per year.</td><td>Status of achievement: Achieved (Not continued).
(Project Completion)
- 20,000 Pargo fry were produced in 2013.</td><td>Source: Project Completion Report.</td></tr>
<tr><td></td><td></td><td>(Ex-post Evaluation)
- 1,500,000 and 3,500,000 Pargo fries were produced respectively in 2015 and 2016, but since 2017 there has been no production.
Table: Pargo production at SCS (Unit)
<table>
<tr><td></td><td>2015</td><td>2016</td><td>After 2017</td></tr>
<tr><td>Brood stock rearing</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>Fertilized eggs</td><td>24,000,000</td><td>9,000,000</td><td>0</td></tr>
<tr><td>Fry production</td><td>1,500,000</td><td>3,500,000</td><td>0</td></tr>
</table></td><td>Source: SCS.</td></tr>
<tr><td>(Overall goal)
Government of Cuba runs the fish culture of Pargo.</td><td>1. An aquaculture center (for seed production) of Pargo is established.</td><td>Status of achievement: Not achieved.
(Ex-post Evaluation)
- Any aquaculture center for seed production has not been established.</td><td>Source: SCS</td></tr>
</table>

3 Efficiency

Both the project cost and the period exceeded the plan (ratio against the plan: 148% and 132%, respectively). The reasons of the excess were that some activities were suspended by the damages caused by hurricanes in 2008, and it was required to repeat two more cycles (spawning seasons) to achieve the expected objectives. As a result, the planned Outputs were produced. Therefore, the project efficiency is fair.

4 Sustainability

<Policy Aspect>

The sustainable development of technically and environmentally viable marine crops has been aimed by the MINAL's strategy, "National Mariculture Strategy of the Republic of Cuba". Also, the aquaculture development has been considered as one of the important measures of the food industry sector which need to be monitored based on the "Economic management system of the Plan 2021". On the other hand, although the development of Pargo and Robalo production has been still considered as one of the prioritized aquaculture activities, there are other activities which have been considered higher in priority, such as shrimp, tilapia, oyster and cobia.

<Institutional/Organizational Aspect>

According to SCS, although it has stopped seed production of Pargo and Robalo, it has sustained technical staff, including two experts in biology and other five technicians. Three of the five technicians who had worked in the production of microalgae and rotifers were transferred to other centers. At the moment of ex-post evaluation, SCS has been playing a implementing role of a nationally prioritized project on the red tilapia production adopted to marine water. The red tilapia is accepted widely in terms of domestic consumption, and the project aims to improve the production technologies and extend the production in the other areas of the country.

According to SCS, the state-owned companies in surrounding territories have new organizational measures to allow their producers to engage in fish farming, and some private producers in the municipality of Santa Cruz del Sur have shown interest in marine fish farming, as well as some local companies from other provinces. These producers expect SCS to produce fingerlings of Pargo and Robalo and to transfer the technology of floating cages culture to them.

<Technical Aspect>

According to SCS, the technical staff has sustained skills and knowledge for seed production of Pargo and Robalo, as the counterpart staff members who worked at the project continued some cultivation practices until 2018 and maintained the broodstock banks of both species. Staff members who newly joined SCS have been rotated in different sections of fish farming to learn the work. Meetings and training on relevant topics have been conducted frequently. All of the manuals on biological feed production and artificial seed production developed by the project have been utilized at SCS and also distributed among fishing companies that have been awaiting a decision to develop floating cage culture up to the commercial scale.

<Financial Aspect>

Financial data was not available at the ex-post evaluation survey. According to SCS, for the 2015-2018 period, the entire budget of SCS was dedicated to maintaining and extending the results related to the aquaculture of Pargo and Robalo. However, due to the economic situation in Cuba, it has been difficult to secure a sufficient budget as described above. CIP has sought alternative financial sources from international organizations such as FAO, but it has not received any. At the moment of ex-post evaluation SCS was dedicated to the activities of red tilapia.

<Evaluation Result>

In the light above, the implementing agency has had higher institutional priority in other activities, and it has had major financial issues in the cultivation of Pargo and Robalo. Therefore, the sustainability of the effects is low.

5 Summary of the Evaluation

The Project Purpose which was to strengthen SCS's capacity of Robalo and Pargo culture (up to the fry production) was achieved. However, SCS stopped seed and fry production of Robalo and Pargo in 2017, and thus the Overall Goal which was to establish a seed production center has not been achieved. Regarding sustainability, the organizational structure and budgets for the production of Pargo

and Robalo have not been sufficient. With regard to the project efficiency, both the project period and cost exceeded the plan.
Considering all of the above points, this project is evaluated to be unsatisfactory.

III. Recommendations & Lessons Learned

Recommendations for Implementing agency:

- It is recommended to SCS and CIP to fully utilize the developed technologies, experiences and acquired facilities/equipment through the project in the development of other aquaculture activities, which are currently prioritized by the government, such as the production of red tilapia in SCS.
- When CIP/MINAL considers to reengage in the production of Pargo and/or Robalo in the future, it is recommendable to conduct a study on the market, production chain as well as the feasibility, to plan their production getting the involvement of surrounding producers. Also the appropriate technologies to grow fingerlings to commercial size using floating cages should be determined, using the experiences gained through the project, as well as the other experiences accumulated in the CIP, such as the production of other species like cobia.

Lessons Learned for JICA:

- Although it was considered that the project achieved the Project Purpose at the end of extended project period, some factors necessary for the achievement of the Overall Goal had not been sufficiently studied during the project period, such as the economic feasibility, the involvement of local producers and the development of appropriate technologies to promote locally the cultivation of Pargo and Robalo, including the floating cage farming, the development of feasible feed, and technical extension to the local producers, which were only mentioned as issues to be solved after the Project in the project completion report. The establishment of production chain with local producers was not also considered sufficiently. In order to achieve the social implementation of developed technologies as the Overall Goal of the project, it was necessary to contemplate such issues including their solutions, from the technical, financial and social aspects in the project design more clearly and continue to examine the issues during the project .

Site visit at SCS by JICA Cuba Office in August 2020. Red tilapia was cultivated in the tank. The building was constructed by the Project.

Site visit at SCS by JICA Cuba Office in August 2020. 10 matured robalos were still kept in one of the tanks.