

Country Name	Project for Shellfish Aquaculture Development in the Republic of El Salvador
Republic of El Salvador	

I. Project Outline

Background	<p>El Salvador, experiencing the civil conflict from 1980 to 1992 and a big earthquake in 2001, has faced issues such as development of socio-economic infrastructure, creation of employment opportunities and narrowing the income gap between the urban and rural areas. In particular, the eastern region to which the departments of Usulután and La Unión belong has been less developed socially and economically and identified as a priority region for poverty reduction by the Salvadoran government. After the civil conflict, the inland people migrated to the coastal area and started collecting shellfish, which caused a decrease and deterioration of the coastal resources. Also, the fishing bank became farer. As a result, artisanal fishers have had problems of decreased income and increased working time. As collecting Anadara shellfish does not require any special skills or tools, poor women and children have been forced to work in foul conditions. In such circumstances, the Salvadoran government requested for technical cooperation to Japan on technology development of shellfish aquaculture which could be disseminated for the artisanal fishers and raising of the fishers' awareness on sustainable coastal resources for livelihood improvement of the artisanal fishers.</p>						
Objectives of the Project	<p>The project aimed at establishing the model for upgrading livelihood through shellfish culture with appropriate coastal resources management, in order to disseminate the model to other areas in the Jiquilisco Bay of the department of Usulután and the coastal area of the department of La Unión.</p> <ol style="list-style-type: none"> 1. Overall Goal: The model for upgrading livelihood mainly by introducing shellfish culture is disseminated in the Jiquilisco Bay of the department of Usulután and the coastal area of the department of La Unión. 2. Project Purpose: The model for upgrading livelihood is proposed mainly by introducing shellfish culture based in an appropriate coastal resources management. 						
Activities of the Project	<ol style="list-style-type: none"> 1. Project site: Jiquilisco Bay of the department of Usulután and the coastal area of the department of La Unión 2. Main activities: i) Experimental seeds production of Anadara species¹ and Pacific Oysters and experiments of adhesion of local oysters, ii) Experimental culture of Anadara species and Pacific Oysters and rearing local oysters at the artificial reef, iii) Awareness-raising activities for fishers on the use of marine resources, iv) Training for primary school teachers on the environmental education, and v) Implementation of model projects of shellfish aquaculture and other productive activities than fishery by the target fishers. 3. Inputs (to carry out above activities) <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> Japanese Side 1) Experts: 8 persons 2) Training in Japan: 2 persons 3) Equipment: Equipment and tools related to seeds production, etc. 4) Local operation cost: operational cost for the seeds production facility, hiring local consultants, drivers, workers, consumables, etc. </td> <td style="width: 50%; vertical-align: top;"> Salvadoran Side 1) Staff allocated: 10 2) Land and facilities: Office space and experts' lodges, facility for seeds production, etc. 3) Local Cost: Electricity, fuels, vehicle insurance, hiring security guards, etc. </td> </tr> </table> 					Japanese Side 1) Experts: 8 persons 2) Training in Japan: 2 persons 3) Equipment: Equipment and tools related to seeds production, etc. 4) Local operation cost: operational cost for the seeds production facility, hiring local consultants, drivers, workers, consumables, etc.	Salvadoran Side 1) Staff allocated: 10 2) Land and facilities: Office space and experts' lodges, facility for seeds production, etc. 3) Local Cost: Electricity, fuels, vehicle insurance, hiring security guards, etc.
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Ex-Ante Evaluation	2004	Project Period	January 2005 to January 2010 (Extended period: January 2008 to January 2010)	Project Cost	(Ex-ante) 350 million yen (Actual Results) 406 million yen		
Implementing Agency	Center for Fishery and Aquiculture Development (CENDEPESCA), Ministry of Agriculture and Livestock (MAG)						
Cooperation Agency in Japan	Fisheries and Ocean Technology Center, Hiroshima Prefectural Technology Research Institute, Yamaguchi Prefectural Fisheries Research Center						

II. Result of the Evaluation

1 Relevance
<p><Consistency with the Development Policy of El Salvador at the time of ex-ante evaluation and project completion></p> <p>The project was consistent with Salvadoran development policies, as the National Development Plan (2004-2009) includes, as strategic objectives of MAG, implementation of social productive activities in the fishery sector and institutional development for sustainable development of fishery and aquaculture via fishery resource management. Also, in the National Development Policy (2009-2014), economic reform is one of the pillars under which fishery is one of the important themes.</p> <p><Consistency with the Development Needs of El Salvador at the time of ex-ante evaluation and project completion ></p> <p>The eastern region including Usulután and La Unión was socially and economically less developed and the poverty level of the artisanal fishers was very high. The coastal resources such as local oysters and Anadara species were decreasing and getting smaller. There were great needs for profitable shellfish culture based on appropriate coastal resources management.</p> <p><Consistency with Japan's ODA Policy at the time of ex-ante evaluation></p> <p>In the Policy Consultations for Economic Cooperation in 2004, the agreed assistance priorities include "social development" for socio-economic development in the area with poverty.</p> <p><Evaluation Result></p> <p>In light of the above, the relevance of the project is high.</p>

¹ Target kinds of the project is Curil and Casco de Burro.

2 Effectiveness/Impact

<Status of Achievement for the Project Purpose at the time of Project Completion>

The Project Purpose was achieved, through the project outputs such as increased capacity of CENDEPESCA and its branch in Puerto El Triunfo (CPT)² on seeds production excluding that of Casco de Burro and aquaculture of shellfish and implemented model projects for livelihood improvement. More model groups than planned of Jiquilisco Bay of the department of Usulután and the coastal area of the department of La Unión gained necessary skills and they became capable to implement farming activities of Anadara species, Pacific Oysters and local oysters. Through the pilot activities, CPT validated the model for profitable activities for livelihood improvement and compiled the experience as a guidebook.

<Continuation Status of Project Effects at the time of Ex-post Evaluation>

Many of the above mentioned effects have continued. Seven of the 10 surveyed model groups have continued aquaculture activities of Anadara species and Pacific Oysters and kept making profits. Among the 4 groups which started the activities for diversification of income sources, one has continued the restaurant management. However, two gave up the shrimp culture activities because the sites were not suitable, which had not been appropriately identified by CENDEPESCA. One closed chicken and cattle farming activities. These were new to the fishers and it took time to get accustomed to these activities. Therefore, they did not pay much attention to these side businesses. Also, coastal resource has been managed, as artificial reefs for local oysters and fishing has been cultivated. The guidebook developed by the project has been utilized as an activity formulation and monitoring tool under the Family Agriculture Program (PAF) of MAG.

<Status of Achievement for Overall Goal at the time of Ex-post Evaluation>

The overall goal has been partially achieved. CPT has disseminated the model for farming of Anadara species and Pacific Oysters, by providing the artisanal fishery groups with technical and material support so that they could maintain the culture activities and then sell the products to the market. More groups than targeted have utilized livelihood improvement model in Fonseca Gulf and the coastal area of the department of La Unión, but not in Jiquilisco Bay. Since the project completion, three JICA volunteers have been working with CPT for extension and training for livelihood improvement activities of the fishers. The reason for less achievement in Jiquilisco Bay was that, although some fishers' associations were established, they had internal problems and some of them stopped working as an association. At the moment of the ex-post evaluation, only two associations were active. For shellfish farming, there have been promoting factors such as increased demand and unit price for selling.

<Other Impacts at the time of Ex-post Evaluation>

Firstly, according to the interviewed fishermen, because of the managed and profitable shellfish farming activities, children now do not have to help their parents in the unsafe mangrove swamp and instead can attend the school. Secondly, the working condition of the female fishers has been improved: They have a safer place (guardhouse) to take care of the growing fields at night, and can use more time for other chores such as childcare and handcrafts. Thirdly, the model developed by the project has been diffused to neighboring countries. CENDEPESCA sells Pacific Oyster seeds to Guatemala and Honduras which are currently trying to culture this species. Also in another JICA project³, CENDEPESCA has shared the project experience on shellfish aquaculture with other countries including Belize, Guatemala, Honduras, Nicaragua, Panama, etc.

No negative impacts have been reported on the natural environment and land acquisition and resettlement.

<Evaluation Result>

The project achieved its Project Purpose by validating the profitable model for livelihood improvement through farming activities of Anadara species, Pacific Oysters and local oysters, and most of these model activities have been continued. CENDEPESCA has continued dissemination activities to other communities. The achievement level of the Overall Goal of doubling the number of the communities which implement model farming activities has been partial, but there have other positive impacts of the project. Therefore, effectiveness/impact of the project is high.

Achievement of the Project Purpose and Overall Goal

Aim	Indicators	Results
(Project Purpose) The model for upgrading livelihood is proposed mainly by introducing shellfish culture based in an appropriate coastal resources management.	1. Model groups (more than 5 groups of Jiquilisco Bay of the department of Usulután and the coastal area of the department of La Unión) are able to continue culture of Anadara species and/or Pacific Oysters with technical support from CENDEPESCA.	(Project Completion) <u>Achieved</u> . - 10 model groups gained necessary skills and they were able to continue the farming activities with continuous support from CENDEPESCA, including provision of seeds and farming materials, strengthening of organizations, commercialization, etc. (Ex-post Evaluation) <u>Partially continued</u> . - 4 of the 7 surveyed groups of Jiquilisco Bay have continued the farming activities of Anadara species. - All of the 3 surveyed groups on the coastal area of La Unión have continued the farming activities.
	2. A model group of the coastal area of the department of La Unión is able to implement local oyster fishing activities with support from CENDEPESCA.	(Project Completion) <u>Achieved</u> . - Artificial reefs were installed at Las Tunas beach for the fixation of local oysters for the use of the local fishers. (Ex-post Evaluation) <u>Continued</u> . - 1 model group of the coastal area of La Unión has cultivated artificial reefs for local oysters and fishing.
	3. Profitability of the model for livelihood improvement is validated in the model projects.	(Project Completion) <u>Achieved</u> . - The profitability of 5 livelihood activities was examined and compiled as guidebooks for fishers. (Ex-post Evaluation) <u>Partially continued</u> . - Among the 10 surveyed groups, 7 have made profits from their activities. The other 3

² CPT is responsible for shellfish aquaculture development.

³ Project for Improving the Production and Extension of the Mollusks Aquaculture Technology (2012-2015)

		discontinued the activities.
	4. The guidebook on the model for livelihood improvement of artisanal fishers is approved by CENDEPESCA and target fisher communities.	(Project Completion) <u>Achieved</u> . - The guidebook on the model for livelihood improvement of artisanal fishers (above 5 activities) was approved by CENDEPESCA. (Ex-post Evaluation) <u>Continued</u> . - The guidebook has been used for developing and monitoring projects under the Family Agriculture Program of MAG. The guidebooks were distributed to 1,000 fishermen.
	5. Counterpart personnel of CENDEPESCA become able to conduct seeds production, farming method and orientation to fishers without support from Japanese experts.	(Project Completion) <u>Partially achieved</u> . - Technical counterpart personnel gained a certain level of abilities in seeds production (excluding the seeds production of Casco de Burro and raising methods of reproducers of Pacific Oysters), farming methods, and the orientation to the fisher groups. (Ex-post Evaluation) <u>Continued</u> . - CPT personnel has continued seeds production of Curil and Pacific Oysters and technical assistance to the communities based on the annual plan.
(Overall Goal) The model for upgrading livelihood mainly by introducing shellfish culture is disseminated in the Jiquilisco Bay of the department of Usulután and the coastal area of the department of La Unión	The number of the groups of artisanal fishers which utilize the whole or some part of the model for upgrading livelihood is doubled from that at the project completion time in the Jiquilisco Bay of the department of Usulután and the coastal area of the department of La Unión.	(Ex-post Evaluation) <u>Partially achieved</u> . - Projects for upgrading livelihood based on the model have been disseminated and implemented in 8 groups in Jiquilisco Bay, 4 groups in Fonseca Gulf, and 3 groups in the the coastal area of the department of La Union (15 groups in total)*. *Target: 14 groups in Jiquilisco Bay, 4 groups in Fonseca Gulf, and 2 groups in the the coastal area of the department of La Union (20 groups in total).

Source: CENDEPESCA and CPT.

3 Efficiency

Both the project cost and period exceeded the plan (ratio against the plan: 116% and 166%, respectively), in order to complete the outputs which should have been produced within the original period, such as establishing the system for massive production of Anadara seeds and pacific oyster aquaculture. Therefore, efficiency of the project is low.

4 Sustainability

<Policy Aspect>

Improvement of the artisanal fishers through shellfish aquaculture and other income sources has been prioritized in the government development policies and programs such as PAF (2011-2015) of MAG. In this program, aquaculture including shellfish production and sale is regarded as an important value chain. Even after 2015, MAG plans to continue the support for artisanal fishers through available trust fund or other MAG programs.

<Institutional Aspect>

There has been and will be no change in the functions of CENDEPESCA for shellfish aquaculture development; CENDEPESCA undertakes responsible for planning, management, research for the fishery sector, and CPT is responsible for shellfish aquaculture development including seeds production and artificial adhesion of local oysters. The numbers of the personnel of the headquarters and CPT are 4 and 5 respectively, which are sufficient to conduct the planned activities for the moment. However, more personnel will be needed if CENDEPESCA extends the dissemination plan, undertakes more massive seed production or starts any new activities. Along with MAG's Operational Activity Plan, CENDEPESCA develops the annual plan for dissemination, technical assistance to the fishers and seeds production and distribution of shellfish and oysters. With regard to dissemination of the livelihood improvement activities, CENDEPESCA collaborates with municipalities and international and national NGOs and JICA volunteers. CPT conducts weekly monitoring of its production activities and monthly monitoring on the fishery activities. Power centralization has been an issue for efficient program implementation, but it has also advantages in getting necessary support and funds.

<Technical Aspect>

CENDEPESCA has annually sent its headquarters and all CPT staff to JICA training courses on fishery management and shellfish aquaculture conducted in Japan or Chile. CENDEPESCA considers CPT has sufficient knowledge and techniques for production of Curil and Pacific Oysters, but still they need to acquire techniques for obtaining matured individuals of Casco de Burro. The technical manuals developed by the project were updated during the subsequent project mentioned in a footnote 3, and they have been used in the training for CPT technicians and fishers. The guidebooks developed by the project were distributed to as many as 1,000 fishers in all of the target 16 communities by the project. The interviewed fishers answered that it was very useful, because it covered all necessary technical issues on aquaculture of Anadara species and Pacific Oysters and also it could help them share their knowledge with other fishers.

<Financial Aspect>

The budget of CENDEPESCA comes from the central government via MAG. Financial data of CENDEPESCA was not available. Besides the allocation from the government, it has revenues from selling shellfish seeds to other countries (approximately US\$3,000 in total). CENDEPESCA answered that it has sufficient resources to maintain the current seeds production and aquaculture of Anadara species and Pacific Oysters and dissemination of livelihood improvement activities, unless it expands these activities. For maintenance of the facility for seeds production, the monthly budget of US\$1,000 has been secured, which is not sufficient. Fishery groups has got fund from the trust fund⁴ for implementing their livelihood improvement activities such as buying boats and their motors.

<Evaluation Result>

⁴ The trust fund (Responsible Artisanal Fishery) has \$800,000 available each year for legally established artisanal fishery groups. Artisanal fishery groups apply for it by presenting their legal status, activities, production, etc., and the application is evaluated and approved by a committee of the El Salvador Artisanal Fishery Federation and MAG, which also monitor the fund use.

Slight problems have been observed in terms of the institutional, technical and financial aspects of the implementing agency. Therefore, sustainability of the project is fair.

5 Summary of the Evaluation

The Project Purpose was achieved, as CENDEPESCA succeeded in validating the profitable model for livelihood improvement through farming activities of Anadara species, Pacific Oysters and local oysters, and many activities have been continued. The overall goal of doubling the number of the communities which implement model farming activities was partially achieved and there are several other positive impacts. Regarding the sustainability, still CTP needs to acquire techniques for obtaining matured individuals of Casco de Burro. As for the project efficiency, both the project cost and period exceeded the plan to complete all the planned outputs such as establishing the system for massive production of Anadara seeds and Pacific Oyster aquaculture.

In light of the above, this project is evaluated to be partially satisfactory.

III. Recommendations & Lessons Learned

<Recommendations for CENDEPESCA>

1. It is recommended to increase the budget and technicians of CPT to further expand its activities including dissemination of the model for livelihood improvement activities of artisanal fishers in other areas than the target departments and also to continue technical support for the fishers who implement the model activities. The already-trained staff should share their knowledge and skills with the new staff for continuing the project-related activities.
2. It is ideal to continue experience exchanges with other neighboring countries in order to not only learn from them but also see the possibility of selling seeds produced by CENDEPESCA.

<Lessons Learned for JICA>

1. In the project, chicken or cattle raising activities were introduced as part of the livelihood improvement model projects. However, since the project completion, these activities have not continued, because these were new to the artisanal fishers and they did not pay much attention to these side businesses. It is important to have alternative income sources for livelihood improvement. However, when side business activities are introduced in a project, they should have been what interests the implementers and complements the main activities, but not what are unfamiliar to them, so that they could continue the activities to make profits. To ensure these, it is important to carefully examine the beneficiaries' needs and technical applicability through direct communication with them.



Fisher showing Pacific Oysters at their breeding site in Meanguera del Golfo Island, La Unión



CENDEPESCA technicians giving Pacific Oyster seeds to a fishers' group in Conchagüita Island, La Unión