Indonesia

Ex-Post Evaluation of Japanese Technical Cooperation Project

"Freshwater Aquaculture Development Project"

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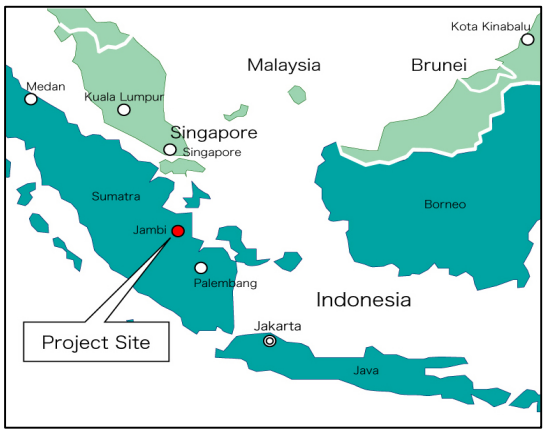
0. Summary

Implementation of the Freshwater Aquaculture Development Project has been highly relevant to the development policies and needs of Indonesia and the development policies of Japan, and thus, the relevance of the project is high. However, the efficiency of the project inputs is low because the project period had to be extended by two years on account of a delay in the construction of broodstock ponds. This situation was a result of the late acquisition of land and the late disbursement of the government budget from the Government of Indonesia. It is also low because the project cost was believed to be higher than planned. The project has either achieved or mostly achieved all of the five outcomes and has generally attained the planned effects. Therefore, the effectiveness of the project is high. The Strategic Plan (2010–2014) of the Ministry of Marine Affairs and Fisheries aims to "increase the productivity of aquacultures and develop human resources as a means of improving the productivity and competitiveness of the knowledge-intensive marine products industry," and thus, the sustainability of the policy as regard to the project is high. In addition, no major problems have been observed in the institutional, technical, and financial aspects of the Freshwater Aquaculture Development Center at Jambi (BBAT Jambi); and thus, the sustainability of project effects/impacts is also high.

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

1. Project Description



Project Location

Patins in a fish farm aquaculture pond

1.1 Background

After being hit by the Asian financial crisis in 1997, Indonesia was having serious social problems, such as a shortage of food supply and loss of employment opportunities, and accordingly, the aquaculture, forest, and fisheries sectors required an urgent policy to respond. The then Directorate

General of Fisheries at the Ministry of Agriculture[1] was planning to invest in infrastructure development for BBAT Jambi in order to maintain and increase the food supply and employment opportunities by using the counter fund of the sector program loan that the Japan International Cooperation Agency (JICA) had lent as an urgent economic countermeasure. Meanwhile, the Government of Indonesia believed that a technical cooperation was inevitable for the purpose of developing simple aquaculture technology that small-scale farmers could use with minimum capital and promoting dissemination activities based on the aquaculture technology of existing and new fish culture species; and thus, requested one with the Government of Japan.

1.2 Project Outline

Overall Goal		Sustainability of freshwater aquaculture of small-scale fish farmers is improved.
Project Objective		Dissemination activities for appropriate applied freshwater aquaculture technologies available to small-scale fish farmers are developed and strengthened.
Outputs	Output 1	High quality broodstock of existing freshwater fish culture species is supplied to seed production units.
	Output 2	Quality of aquaculture products (seed and grow-out fish) of existing freshwater fish culture species is improved.
	Output 3	Fish breeding technologies for new fish culture species are developed.
	Output 4	Effective extension models adjusted to the local conditions are established.
	Output 5	The Stakeholders in the project area are more interested in freshwater aquaculture.
Input		【Japanese side】 1. Experts: 31 experts (Long-term: 8 experts, Short-term: 23 experts) 2. Trainees received: 27 trainees 3. Third country training program: N/A 4. Equipment: 195 million yen 5. Local cost: 98 million yen 6. Others: Study teams of the mid-term review, the terminal evaluation, and the terminal evaluation for the extended period 【Indonesian side】 1. Counterparts: 30 counterparts 2. Land and facilities 3. Local cost: 325 million yen
Project Cost		1,002.53 million yen
Project Period		August 2000 to August 2005 & August 2005 to August 2007 (extension)

[1] The Directorate General of Fisheries at the Ministry of Agriculture became the Ministry of Marine Affairs and Fisheries in 2000 owing to a reorganization of government ministries.

Executing Agency	Freshwater Aquaculture Development Center at Jambi (BBAT Jambi) under Ministry of Marine Affairs and Fisheries (Former Directorate General of Fisheries at the Ministry of Agriculture)
Cooperation Agency in Japan	Ministry of Agriculture, Forestry, and Fisheries (Fisheries Agency), Tokyo University of Marine Science and Technology, and Prefectural Fisheries Experimental Stations
Related Projects	Construction of hatcheries for shrimps and fish eggs with the use of the counter fund of the sector program loan by JICA.

1.3 Outline of the Terminal Evaluation

1.3.1 Achievement of Overall Goal

According to the terminal evaluation of the project in 2005, it was too early to judge whether the overall goal had been achieved even though the volume of freshwater aquaculture production in the six provinces of the southern part of Sumatra was increasing each year. However, according to the terminal evaluation of the project for the extended period in 2007, the achievement of the overall goal was judged to be high since the volume was expected to increase in the future.

1.3.2 Achievement of Project Objective

According to the terminal evaluation in 2005, it was judged that the achievement of the project objective was not low, since as a result of the project's development and dissemination of many aquaculture technologies, the number of fish farms was increasing, and subsequently, fish farms that increased the volume of freshwater aquaculture production and amount of income appeared. The terminal evaluation for the extended period in 2007 also judged that the project objective was achieved owing to the result of strengthened dissemination activities.

1.3.3 Recommendations

The terminal evaluation in 2005 made the following recommendations. The recommendations and the situation for responding to them at the time of the terminal evaluation were as follows:

1. To achieve the project objective, it is important that the project continues six of the nine activities that were not completed by the terminal evaluation in 2005 and is extended for another two years. Through their own efforts, the counterparts should continue the remaining three activities.
   → During the two years of the extended period, all the nine activities were completed.
2. Javanese technology as well as the Japanese-Indonesian hybrid technology that the project developed should be fully utilized, and dissemination activities should be carried out jointly with other organizations including the local government.
   → BBAT Jambi developed new fish culture species, especially sand goby, by using all available technologies and worked with the local government in the extension areas.

3. BBAT Jambi should take measures against fish diseases, such as Koi Herpesvirus (KHV), encourage fish farms to understand the importance of preventing these diseases, and promote management of water quality and growth of healthy seeds.

→ BBAT Jambi took measures against fish diseases and encouraged fish farms to understand the importance of preventing these diseases. It also promoted management of water quality and growth of healthy seeds.

The terminal evaluation for the extended period in 2007 made the following recommendations. The recommendations and the situation for responding to them at the time of the ex-post evaluation were as follows:

1. BBAT Jambi and the provincial and district fisheries services should play a major role in financial and technical support for district government hatcheries.

→ BBAT Jambi now provides technical support, and provincial and district fisheries services provide financial support for district government hatcheries.

2. The Directorate General of Aquaculture at the Ministry of Marine Affairs and Fisheries (formerly the Directorate General of Fisheries at the Ministry of Agriculture) should maintain at least the present level of budgetary allocation for BBAT Jambi's monitoring and technical guidance since identification of the needs of fish farms through monitoring is a solid foundation for BBAT Jambi's activities.

→ The annual budget of BBAT Jambi, supported by the Strategic Plan of the Ministry of Marine Affairs and Fisheries, has been increasing each year and is sufficient to cover annual operation and maintenance costs.

2. Outline of the Evaluation Study

2.1 External Evaluator

Mr. Koichiro Ishimori, Value Frontier Co., Ltd

2.2 Duration of the Evaluation Study

The ex-post evaluation study was implemented according to the following:

Duration of the study: October 2010–October 2011

Duration of the field study: December 12–December 25, 2010 and April 10–April 16, 2011

2.3 Constraints during the Evaluation Study

Some data in the model areas for the project (Bungo Tebo and Batanghari in Jambi Province, Bengkulu Utara in Bengkulu Province, Kuantan Singingi in Riau Province, and Sijungjung in West Sumatra Province) were incomplete, and thus, there was a partial constraint on the analyses of the effectiveness of the project.

3. Results of the Evaluation (Overall Rating: B)

3.1 Relevance (Rating: ③)

3.1.1 Relevance with the Development Policies/Plans of Indonesia

Program Pembangunan Nasional (ROPENAS) (2000–2004) aimed to "strengthen sustainable and fair development foundations based on the promotion of economic reconstruction and the national economic system" as one of its five priorities, and attempted to seek the "development of agribusiness" to realize this aim.

Program Peningkatan Ekspor hasil Perikanan (PROTEKAN) (1998–2003) aimed to "contribute to the Indonesian economy and stable food supply" as its vision, and attempted to seek "greater production of aquaculture" to realize this aim. One of the priorities was to develop the human resources engaging in aquaculture.

Rancangan Pembangunan Jangka Menengah Nasional (RPJMN) (2005–2009), which covered the original and extended period, aimed to "realize an economy that builds a solid foundation for sustainable development" as one of its three priorities, and attempted to seek "revitalization of agriculture, forestry, and fisheries" to realize its aim.

Furthermore, the Strategic Plan (2005–2009) of the Ministry of Marine Affairs and Fisheries aimed to "achieve the welfare of the people through sustainable management of marine resources" and attempted to seek "an increase in fishermen's income" to realize this aim. One of the priorities was promoting freshwater aquaculture and capacity development in fishermen.

Aquaculture was prioritized in the national development plans and the sector plan both at the time of planning and at the completion of the project. In light of the above, the project is judged to be relevant with the national development plans and sector plan.

3.1.2 Relevance with the Development Needs of Indonesia

Before the project, freshwater aquaculture production in Indonesia accounted for roughly 25% of the total production, and fishes from freshwater aquaculture were an important source of protein for the people. However, the production was approximately 70% of the target owing to the traditional production system of the fisheries and the limited fish culture species. In addition, the industry provided 1.83 million fish farmers with employment opportunities in 2000 when Indonesia was still suffering from the Asian financial crisis. Therefore, the project, which intended to promote freshwater aquaculture with a view of stabilizing and increasing food supply and employment opportunities, met the development needs at that time. In light of the above, the need for the project was judged to be high.

At the time of the terminal evaluation for the extended period, freshwater aquaculture fish in Indonesia were still an important source of protein for the people[2] and the industry provided 1.64

[2] According to the "Annual statistics (2008)" of the Statistical Bureau of Indonesia, the three biggest sources of protein are cereals (61%), nuts (25%), and fish (10%), with fish being bigger than meat and dairy products. Moreover,

million fish farmers with employment opportunities in 2007. The western part of Indonesia was experiencing an epidemic of KHV; thus, the project took measures against it and established a new system based on changes in the dissemination system of freshwater aquaculture resulting from decentralization. Therefore, the project, which intended to promote freshwater aquaculture with the aim of stabilizing and increasing the food supply and employment opportunities while responding to the changing environment, still met the development needs at the time of the terminal evaluation for the extended period. In light of the above, the need for the project was judged to be high.

3.1.3 Relevance with Japan's ODA Policies

The Charter on Official Development Assistance (ODA) (1992) before the project highlighted the importance of "cooperation for improving technologies, such as research cooperation that would improve the capability of research and development and adaptability by developing countries." The current Charter on ODA (2003) highlights the importance of "cooperation for agriculture," including fisheries, the "creation of employment" with the goal of poverty alleviation, and "research cooperation" with the goal of sustainable growth.

The Mid-term Policy on ODA (1999) prioritized "cooperation for improvement and effective dissemination of fisheries technologies, such as development of new varieties" in order to secure a stable food supply. The current Mid-term Policy on ODA (2005) prioritizes "securing the food supply" in order to contribute to the security and prosperity of the international society.

In light of the above, the project that contributes to stable food supply through aquaculture is judged to be relevant with Japan's ODA policies.

In sum, the project has been highly relevant with Indonesian development policies/plans and development needs, as well as Japan's ODA policies. Therefore, its relevance is high.

3.2 Effectiveness, Impact (Rating: ③)

3.2.1 Effectiveness

3.2.1.1 Outputs

Output 1: High quality broodstock of existing freshwater fish culture species (i.e., carps, tilapias, patins, and freshwater prawns) is supplied to seed production units.

According to the terminal evaluation of the project, 2,217 specimens of carps, 2,400 kg of tilapias, and 200 kg of patins were supplied, and there was no mention of freshwater prawns. The ex-post evaluation confirmed that it had become possible by the end of the extended period to secure and supply high quality broodstock of all of the existing freshwater fish culture species

since freshwater aquaculture production accounts for approximately 20% of the total production and is second to marine production, that is, 57%, the importance of freshwater aquaculture as a food supply (a source of proteins) is recognized.

except for freshwater prawns, as indicator 1 below explains.

Indicator 1: The good quality broodstock which satisfies the needs of seed production unit are secured in the extension area.

Carps : 600 kg of broodstock with a high tolerance against disease was available at the time of the terminal evaluation in 2005; whereas, 2,346 kg was available at the time of the terminal evaluation for the extended period in 2007.

Tilapias : 3,000 kg of fast growing broodstock was available at the time of the terminal evaluation in 2005; whereas, 5,748 kg was available at the time of the terminal evaluation for the extended period in 2007.

Patins : Only 50 kg of fast growing broodstock was available at the time of the terminal evaluation in 2005; whereas, 4,376 kg was available at the time of the terminal evaluation for the extended period in 2007.

Freshwater Prawns[3] : Fast growing broodstock was available and supplied to several seed production units at the time of the terminal evaluation in 2005; whereas, they have not become common owing to low profitability[4].

In sum, it can be stated that output 1 has mostly been achieved.

Carp

Tilapia

[3] The demand for freshwater prawns since the project formulation has been low among small-scale fish farmers in the project areas. However, they were included in the project since the Ministry of Marine Affairs and Fisheries was interested in developing its aquaculture and growing technologies.

[4] The wholesale price of freshwater prawns in 2010 in the capital city of Jambi province where the project was implemented was Rp. 40,000/kg. Since the average pond could cultivate approximately 75 kg, the total wholesale price per pond was approximately Rp. 3 million. Meanwhile, the wholesale price of patins was Rp. 10,000/kg. Since this average pond could cultivate approximately 3,000 kg, the total wholesale price per pond was approximately Rp. 30 million, which was ten times higher than that of freshwater prawns.

	
Patin	Freshwater prawn

Output 2: Quality of aquaculture products (seed and grow-out fish) of existing freshwater fish culture species (i.e. carps, tilapias, patins, and freshwater prawns) is improved.

According to the terminal evaluation in 2005, it was judged that the quality of aquaculture products had improved owing to the constant production of high quality seeds and grow-out fish. The ex-post evaluation confirmed that by the end of the extended period, it had become possible to develop aquaculture and growing technologies for all the existing freshwater fish culture species and to produce them with the exception of freshwater prawns, as explained by indicator 2 below.

Indicator 2-1: The technology for the selection of fish, feed, health control, water quality control, etc. are standardized and possible to disseminate.

Carps : It has become possible to disseminate the technology, since the manual was completed in June 2007 and distributed to approximately 130 organizations in the country.

Tilapias : It has become possible to disseminate the technology, since the manual was completed in July 2007 and distributed to approximately 130 organizations in the country.

Patins : It has become possible to disseminate the technology, since the manual was completed in May 2007 and distributed to approximately 130 organizations in the country.

Freshwater Prawns : It has not become possible to disseminate the technology, since though the manual itself was completed in August 2005, it has not been distributed owing to low demand as explained in footnote 3.

Indicator 2-2: The seed and grow-out fish are produced (based on the standardized technology) steadily in the extension model areas.

Carps : 10-30 small-scale fish farms on average in each province have been able to produce seed and grow-out fish.

Tilapias : 10–30 small-scale fish farms on average in each province have been able to produce seed and grow-out fish.

Patins : 10–30 small-scale fish farms on average in each province (110–120 small-scale fish farms in Jambi) have been able to produce seed and grow-out fish.

Freshwater Prawns : It has not become possible to produce seed and grow-out fish in the areas owing to the reason explained in footnote 3.

In sum, it can be stated that output 2 has mostly been achieved.

Output 3: Fish breeding technologies for new fish culture species (sand goby) are developed.

According to the terminal evaluation in 2005, it was judged that fish breeding technologies for the new fish culture species had been developed since the survival rate for fingerlings that grow to the size of seed was over 50% and more than 1,000 specimens were expected to be raised by the end of the project. The ex-post evaluation also confirmed that the survival rate was over 50% and more than 1,000 species had been raised, as indicator 3 below explains[5].

Indicator 3-1: The necessary number of new specimens broodstock which are for seed production experiment are raised (1,000 by the completion of the project).

Sand goby: More than 1,000 specimens were raised by the end of the project.

Indicator 3-2 : The survival rate of fingerlings until they grow up to the size of seed becomes over 30%.

Sand goby: The survival rate was over 50% by the end of the project in 2005.

Indicator 3-3: Technical papers on fish culture of new species are prepared.

Sand goby: Technical papers were completed in June 2005.

In sum, it is can be stated that output 3 has been achieved.

[5] Sand goby has low profitability because it takes approximately 2 years to grow to the size of seed and has a low wholesale price. Consequently, fish farms have little interest in it, and it has not become common.

Sand goby

Output 4: Effective extension models adjusted to the local conditions are established.

According to the terminal evaluation in 2005, it was judged that effective extension models had been established, though it would take a few years for fish farms to master and practice all the standardized technologies. The ex-post evaluation also confirmed that the models had been established by the end of the terminal evaluations in 2005 and 2007, as indicator 4 explains, and that fish farms understood the standardized technologies and made partial use of them.

Indicator 4-1: Level of improvement of training program

99 training programs (on average 14 programs per year) were implemented by the end of the project in 2005; this resulted in 1,343 participants.

Indicator 4-2: Level of improvement of training textbooks

Training textbooks covering feed, production, and diagnosis were improved by the end of the project in 2005.

Indicator 4-3: The monitoring is held regularly in the model area by counterpart personnel

The monitoring was implemented at the fish farms 38 times (on average 8 times per year) during the original project period and 61 times (on average 30 times per year) during the extended project period. The training contents of the monitoring vary from production and feed to diagnosis.

Indicator 4-4: Level of technology improvement

Fish farms in Bungo Tebo and Batanghari in Jambi Province and Bengkulu Utara in Bengkulu Province were able to understand the standardized technologies and partially use them by the end of the project in 2005, whereas fish farms in Kuantan Singingi in Riau Province and Sijungjung in West Sumatra Province were able to understand them and partially use them by

the end of the extended project period in 2007.

Indicator 4-5: 50% of small-scale fish farms record aquaculture in model areas

According to the counterpart's monitoring results, over 50% of small-scale fish farms took records of aquaculture. The beneficiary survey implemented in Bungo Tebo and Batanghari in Jambi Province during the ex-post evaluation revealed that 95% of 100 small-scale fish farms took records.

Indicator 4-6: The extension manuals are prepared

The extension manuals were prepared by the end of the project in 2005 and completed by the end of the extended period of the Project in 2007

In sum, it can be stated that output 3 has been achieved.

Output 5: The stakeholders in the project areas are more interested in freshwater aquaculture.

According to the terminal evaluation in 2005, it was judged that the implementation of various seminars and the distribution of newsletters had contributed to developing the stakeholders' interest in freshwater aquaculture. The ex-post evaluation also confirmed that they had made the contributions by the end of the terminal evaluation in 2005 as indicator 5 explains.

Indicator 5-1: Exchange of information between the project and local government officials took place twice a year.

Exchange of information between BBAT Jambi and district fisheries services took place roughly every other month (i.e., 6 times per year) during the project. Study tours for district fisheries services that took place in addition to the above also contributed to developing an interest in freshwater aquaculture.

Indicator 5-2: Informative materials for aquaculture extension are published twice a year and distributed.

Informative materials were published and distributed three times a year during the project. The publication and distribution of informative materials was more frequent than planned and this also contributed to developing the stakeholders' interest in freshwater aquaculture.

Indicator 5-3: Fish farmers and district fisheries services have common information on fresh water aquaculture.

Although by the end of the project in 2005, some degree of information was shared among fish farmers and district fisheries services, it was not sufficient for district fisheries services because of

the lack of extension workers. Accordingly, the project has attempted to increase opportunities to share information by conducting monitoring activities for fish farms together with the extension workers of the district fisheries services in the areas that they supervise.

In sum, it can be stated that output 3 has been achieved.

3.2.1.2 Achievement of Project Objective

Indicator 1: Activity level of extension work in the project extension areas

The district fisheries services conducted 27 times of monitoring and extension activities on average per year for small-scale fish farms in the project extension areas during the original project period (in total 136 times); however, this number increased to 48 times on average per year during the two-year of extended project period of the project (in total 96 times).

Indicator 2: The number of small-scale fish farms in the extension model areas are increased

The number of small-scale fish farms increased in all the extension model areas as compared to the number in 2,000 before the project (Table 1). Although the overall number of fish farms in Indonesia decreased by approximately 190,000 during the implementation of the project, the number of small-scale fish farms increased in the extension model areas. This can be attributed to contributions made by the project to effective extension models for small-scale fish farms that were established under output 4 and activities to raise interest among stakeholders that were conducted under output 5.

Table 1: The number of small-scale fish farms

(Unit: household)

Region	2000 (Base)	2007	2008	2009	2010
Bungo Tebo, Jambi	606	1,182	1,449	NA	1,585
Batanghari, Jambi	4,850	6,954	7,116	7,116	7,397
Bengkulu Utara, Bengkulu	978	1,215	1,250	1,325	1,350
Kuantan Singingi, Riau	1,100	1,114	1,279	1,466	1,764
Sijungjung, West Sumatra	5,616	6,258	7,742	8,129	8,540

Source: BBAT Jambi

Indicator 3: The production of freshwater aquaculture in the extension model areas are increased

There was an increase in the production of freshwater aquaculture in all the extension model areas as compared to the production in 2000 before the project (Table 2). The project is believed to have contributed not only to the increase in the number of small-scale fish farms in the extension model areas but also to the increase in the production of freshwater aquaculture because it has supplied high quality broodstock to seed production units under output 1 and has

brought higher productivity to small-scale fish farms by enabling them to conduct high quality aquaculture production under outputs 2 and 3.

Table 2 : The volume of freshwater aquaculture production

(Unit: ton)

Region	2000 (Base)	2007	2008	2009	2010
Bungo Tebo, Jambi Province	89	535	469	1,342	1,721
Batanghari, Jambi Province	372	12,806	15,124	16,317	18,102
Bengkulu Utara, Bengkulu Province	1,512	2,789	3,193	4,031	4,591
Kuantan Singingi, Riau Province	182	1,749	NA	NA	1,860
Sijungjung, West Sumatra Province	2,775	2,865	3,214	4,332	5,733

Source: BBAT Jambi

Indicator 4: The income by freshwater aquaculture of small-scale fish farms in the extension model areas is stabilized.

The beneficiary survey that was implemented for 100 small-scale fish farms in Bungo Tebo and Batanghari in Jambi Province during the ex-post evaluation revealed that the annual gross operating profit from freshwater aquaculture after the project became 3.7 times higher than before, from Rp. 992,040 to Rp. 3,640,243 (inflation-adjusted price) on average, resulting in more than a stabilization of income[6].

In sum, the project has achieved its objective, and thus, the effectiveness of the project is high.

3.2.2 Impact

3.2.2.1 Achievement of Overall Goal

Indicator 1: The production of freshwater aquaculture is increased or stabilized in the high level in the project areas.

The production of freshwater aquaculture in the six provinces of the southern part of Sumatra increased as compared to the production in 2000 before the project (Table 3). The project has carried out activities, such as study tours on freshwater aquaculture, for district fisheries services in the extension model areas to raise their interest under output 5. District fisheries services have also strengthened the seed production system by constructing district government hatcheries. Since BBAT Jambi is the only freshwater aquaculture development center in the six provinces of the southern part of Sumatra, the increases in the production of freshwater aquaculture can be attributed to the project.

[6] The main business of most small-scale fish farms is either agriculture or service businesses, which means that the fish farm is their secondary business. The annual gross operating profit from freshwater aquaculture after the project became approximately 3.5 times higher than before, which was equivalent to only one month of the monthly minimum wage by-law in Jambi Province (Rp. 1,050,000).

Table 3: The volume of freshwater aquaculture production

(Unit: ton)

Region	2000	2009*
Jambi Province	2,812	23,559
Bengkulu Province	5,004	13,160
Riau Province	6,435	37,932
West Sumatra Province	20,476	84,190
South Sumatra Province	15,795	110,391
Lampung Province	4,694	24,758
Total	55,216	293,991

Source: Ministry of Marine Affairs and Fisheries
* Figures from 2009 were used owing to the lack of data since 2010

3.3.2.2 Other Impacts

1) Impacts on the Natural Environment

BBAT Jambi regularly checks the quality of water drained from all extension model areas as well as BBAT Jambi, and has not observed a problem.

2) Relocation and Acquisition of Land

Approximately 20 farms were cultivating lands that were part of the areas where BBAT Jambi was planning to construct its facilities. However, the provincial government resolved the problem by compensating the farmers and offering them an alternative land or job at BBAT Jambi.

3) Other Indirect Impacts

In 2010, BBAT Jambi received the "Citra Pelayanan Prima Award (the best public service award)," for which the President of Indonesia selects one entity from one sector every year, based on the fact that it provides innovative services for small-scale fish farms in the region.

In sum, it can be stated that the implementation of the project generated many positive impacts.

3.3 Efficiency (Rating: ①)

3.3.1 Inputs

Table 4: Comparison of Inputs before and after the Project

Elements of Inputs	Plan	Actual Result (at Terminal Evaluation)
＜Japanese Side＞		
(1) Experts	Long-term: 5 fields Short-term: 2-3 experts/year if necessary	Long-term: 8 experts in 6 fields Short-term: 21 experts in 8 fields
(2) Trainees Received	2-3 trainees/year	27 trainees in total
(3) The Third Country Training	-	-
(4) Equipment	NA	195 million yen
(5) Operational Cost	NA	98 million yen

Total Cost	NA	1,002.53 million yen
＜Indonesian Side＞		
(1) Counterpart	NA	30 counterparts
(2) Land and Facility	Provision of lands and facilities	Late provision of lands and facilities
(3) Local Cost	NA	580.42 million yen[7]

Source: BBAT Jambi and JICA

3.3.1.1 Elements of Inputs

＜Japanese Side＞

The actual number of experts who were dispatched is regarded to be almost as planned. Meanwhile, the actual number of trainees received is regarded to be larger than planned, since the plan was to have 10–15 trainees for the five years of the original project period (and 14–21 trainees for the seven years of the total project period, including the extension period). The other elements could not be compared to the plan owing to a lack of data at the time of the plan.

＜Indonesian Side＞

There was a delay of approximately 14 months in the provisions of land and facilities, which was attributable to a delay in the construction of broodstock ponds resulting from the late acquisition of land and late disbursement of the government budget (the counter fund of the sector program loan). The other elements could not be compared with the plan owing to a lack of data at the time of the plan.

3.3.1.2 Project Cost

The actual project cost could not be compared with the plan owing to a lack of data at the time of the plan. However, it is regarded to be higher than planned, since such inputs as experts dispatched, trainees received, equipment, and local costs increased owing to the two-year of extension of the project.

3.3.1.3 Project Period

The project experienced a two-year extension, since out of the project's 21 activities, 9 were delayed due to a delay in the construction of broodstock ponds resulting from the late acquisition of land and disbursement of the government budget (the counter fund of the sector program loan). Therefore, it can be stated that the extension of the project period had nothing to do with changes in the outputs.

In sum, the actual project cost and the actual project period are regarded to be higher than planned owing to the delay in the construction of broodstock ponds; therefore, the efficiency of the project is low.

[7] The figure has been taken from the terminal evaluation for the original period and the extended period.

3.4 Sustainability (Rating: ③)

3.4.1 Policy Related to the Project

The Strategic Plan (2010–2014) of the Ministry of Marine Affairs and Fisheries aims to "be the world's largest producer of marine and fishery products" and attempts to seek "the further improvement of the welfare of the marine and fishery society" to realize this aim. One of the priorities is to "increase productivity of aquacultures and develop human resources as a means of improving the productivity and competitiveness of the knowledge-intensive marine products industry," and thus, the sustainability of the policy related to the Project is judged to be high.

3.4.2 Institutional Aspects of the Executing Agency

The number of BBAT Jambi staff before the project was 35 (11 administrators and 24 technicians), of which, 15 had graduated from university, 17 from high school, 1 from junior high school and 2 from elementary school. The present number of staff is 98 (36 administrators and 62 technicians), of which 5 had graduated from graduate school, 53 from university, 33 from high school, 4 from junior high school and 7 from elementary school. Now that the quality and quantity of the staff has significantly improved, BBAT Jambi is one of the best freshwater aquaculture development centers in Indonesia. Many technicians have received training through the project on aquaculture production, measures against fish diseases, feed, and extensions, and now carry out each of the responsible tasks related to the training they received without problems; thus, it can be stated that there seems to be no problem with the institutional aspects of BBAT Jambi.

3.4.3 Technical Aspects of the Executing Agency

Since all the aquaculture technologies transferred by the project have been put into manuals, district fisheries services as well as counterparts utilize them on a daily basis. In addition, BBAT Jambi has maintained and even improved its technical capability since the end of the project. For example, it has been encouraging the staff that has received training to teach other staff, planning to design and construct a facility to sterilize fish diseases as well as a laboratory to analyze fish diseases in order to strengthen measures against these diseases, and receiving trainees from Cambodia for freshwater aquaculture development. Thus, it can be stated that there seems to be no problem with the technical aspects of BBAT Jambi.

3.4.4 Financial Aspects of the Executing Agency

The annual government budget of BBAT Jambi, supported by the Strategic Plan of the Ministry of Marine Affairs and Fisheries, increased from Rp. 8.7 billion 2006 to Rp. 9.9 billion in 2010, and covered the annual costs necessary for operation and maintenance. The budget in 2011 has been authorized as Rp. 11 billion and there seems to be no financial problems with operation and maintenance in the future. Furthermore, the sales profit for broodstock and others also increased,

albeit to a small degree, from Rp. 120 million in 2006 to Rp. 760 million in 2010. Since the number of private seed production units and district fisheries services that purchase broodstock and others has recently been increasing and the sales income is expected to increase, there seems to be no problem with the financial aspects of BBAT Jambi.

3.4.5 Continuity of Effects/Impacts

The demand for the aquaculture of carps, tilapias, and patins is still high. In addition, BBAT Jambi has been attempting to develop the environment for sustaining the effects/impacts of the project. The district fisheries services have been making efforts to promote aquaculture by constructing government hatcheries. Therefore, it can be stated that the continuity of the project effects/impacts is high.

In sum, there seems to be no problem with the policy related to the project or with the institutional, technical, and financial aspects of BBAT Jambi; thus, the sustainability of the project effects/impacts is high.

4. Conclusions, Recommendations, and Lessons Learned

4.1 Conclusions

Implementation of the Freshwater Aquaculture Development Project has been highly relevant to the development policies and needs of Indonesia and the development policies of Japan, and thus, the relevance of the project is high. However, the efficiency of the project inputs is low because the project period had to be extended by two years on account of a delay in the construction of broodstock ponds. This situation was a result of the late acquisition of land and the late disbursement of the government budget from the Government of Indonesia. It is also low because the project cost was believed to be higher than planned. The project has either achieved or mostly achieved all of the five outcomes and has generally attained the planned effects. Therefore, the effectiveness of the project is high. The Strategic Plan (2010–2014) of the Ministry of Marine Affairs and Fisheries aims to "increase the productivity of aquacultures and develop human resources as a means of improving the productivity and competitiveness of the knowledge-intensive marine products industry," and thus, the sustainability of the policy as related to the project is high. In addition, no major problems have been observed in the institutional, technical, and financial aspects of the Freshwater Aquaculture Development Center at Jambi (BBAT Jambi); and thus, the sustainability of project effects/impacts is also high.

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

4.2 Recommendations

4.2.1 To BBAT Jambi

Sand goby are not yet common since the project was intended to develop seed production technologies only. It is expected, however, that BBAT Jambi should promote them in the areas where the demands for aquaculture of sand goby is high (e.g., Java) by developing new technologies that make it possible to increase the growing speed, which usually takes two years. It should also promote contributions to freshwater aquaculture in Indonesia by transferring technologies for freshwater prawns to government freshwater aquaculture development centers whose technologies are relatively lagging behind (e.g., BBAT Mandiangin in South Kalimantan and BBAT Tatelu in North Sulawesi).

4.2.2 To JICA

JICA should make use of BBAT Jambi as an entity that can receive third country training programs on freshwater aquaculture since it already has experience in receiving trainees from Cambodia.

4.3 Lessons Learned

The former Directorate General of Aquaculture of the Ministry of Agriculture (the present Ministry of Marine Affairs and Fisheries) had initially planned to finish the construction of the government hatcheries during the five years from 1995 to 2000. However, it was concerned about staying on schedule since the budget was reduced owing to the Asian financial crisis. Accordingly, the former Directorate General of Aquaculture of the Ministry of Agriculture attempted to continue its construction by using the counter fund of the sector program loan that JICA had lent as an urgent economic countermeasure. Nevertheless, it turned out that the project was extended by two years partially because of the delay in the construction resulting from the late disbursement of the government budget by the Government of Indonesia. The government of the recipient country and JICA need to ensure well before the implementation of a project that they enter into an official agreement stating that the government of the recipient country will smoothly allocate the budget necessary for the project.