

**Ex-Post Project Evaluation 2017:
Package II-6 (India)**

January 2019

JAPAN INTERNATIONAL COOPERATION AGENCY

ALFAPREMIA CO., LTD.

EV
JR
18-24

Ex-Post Project Evaluation 2017: Package II-6 (India)

January 2019

JAPAN INTERNATIONAL COOPERATION AGENCY

ALFAPREMIA CO., LTD.

Disclaimer

This report compiles the result of the ex-post evaluations. These are conducted by external evaluators to ensure objectivity, and the views and recommendations herein do not necessarily reflect the official views and opinions of JICA. JICA is not responsible for the accuracy of the English translation, and the Japanese version shall prevail in the event of any inconsistency with the English version.

Minor amendments may be made when the contents of this report is posted on JICA's website.

Comments by JICA and/or the Counterpart Agencies may be added at the end of the evaluation report when the views held by them differ from those of the external evaluator.

No part of this report may be copied or reprinted without the consent of JICA.

India

FY2017 Ex-post-Evaluation of Japanese ODA Loan Project

"The Karnataka Sustainable Forest Resource Management and Biodiversity Conservation Project"

External Evaluator: Noriyo AOKI, Alfapremia Co., Ltd.

0. Summary

This project was implemented with the aim to restore the forests and improving the standard of living of the local residents through tree planting, livelihood improvement activities, and biodiversity conservation activities at the village level¹ by a community participation approach, thereby contributing to the reduction of poverty and conservation of biodiversity in the state of Karnataka in Southwest India

This project is highly relevant since it is consistent with priority areas under the Indian development policy as well as the Japanese ODA policy, and matches the development needs. The efficiency is fair since the project cost is kept within the planned cost but the project period exceeds the planned duration. Trees were planted mostly as per the plan by this project, which has promoted the regeneration of forests. While the degree of contribution of this project towards the improvement of the local standard of living cannot be measured quantitatively, owing to the fact that other factors such as local economic growth have been pushing up household incomes, various impact studies and interviews have confirmed that target households have increased their annual income, at least through income from small scale business through micro credit implemented for a certain period in this project. It can be said that the effectiveness is high since the planted trees had a high survival rate at the ex-post evaluation and further regeneration of forest is expected from the growth of the planted trees. Impacts of the project include conservation of biodiversity, diversification of income generation, activities organized by the village forest committees and the encouragement of women' participation through income improvement activities. In light of these things, the effectiveness and impact of the project are judged as high. The operational and maintenance system of the executing agency is well established without any technical problems, and the state of maintenance is generally favorable. Some issues remain with respect to the management of village forest committees and eco-development committees from a financial perspective, however, overall the sustainability of the effect is high.

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

1. Project Description



Project Location



Self Help Group of Village Forest Committee
Mulur Sub-district, Kolar Division

¹ The village referred in this document is not administrative village "Panchayat Village," but rather a unit of forest village consisting of either a set of settlements or a single settlement.

1.1 Background

The state of Karnataka is located in Southwest India, covers 191,791km² in area, and has a population of approximately 61.1 million². The nominal GDP of the state is 217 billion dollars and ranks the fifth among all Indian states³. Direct investment by foreign capital reached 2.2 billion dollars in FY 2017 and ranked the third in India⁴.

Eighty percent of the population in Karnataka are farmers. Forty nine percent of the revenue in the state comes from agriculture. Rice and sugarcane are cultivated in the plains along the western coast. Coffee and tea are cultivated at the foothill of the Western Ghats. The region produces timber, bamboo, and sandalwood, and the export of sandalwood, in particular, is limited to that produced in this region, as most of the raw materials for sandalwood refined oil in the world are produced in Karnataka. Cotton, onion, grains, sunflower, and peanuts are cultivated in the northwestern part of the state.

1.2 Project Outline

This project is to restore the forests and improving the standard of living of the local residents through tree planting, livelihood improvement activities, and biodiversity conservation activities at the village level by a community participation approach, thereby contributing to the reduction of poverty and conservation of biodiversity in the state of Karnataka in Southwest India.

Loan Approved Amount/Disbursed Amount	15,209 million yen / 15,040 million yen	
Exchange of Notes Date / Loan Agreement Signing Date	March 2005 / March 2005	
Terms and Conditions	Interest Rate	0.75 %
	Repayment Period (Grace Period)	40 years (10 years)
	Conditions for Procurement	General Untied
Borrower / Executing Agency	President of India / Karnataka Forest Dept.	
Project Completion	March 2015	
Main Contractor(s)	None	
Main Consultant(s)	None	
Related Study	SAPROF "Sustainable Forest Management and Development in Karnataka" (Nov. 2004)	
Related Project	ODA Loan Project "Eastern Karnataka Afforestation Project " (1997)	

2. Outline of the Evaluation Study

2.1 External Evaluator

Noriyo Aoki (Alfapremia Co., Ltd.)

² 2011 population census.

³ Karnataka Finance Dept. March 2018 (Estimates).

⁴ Department of Industrial Policy and Promotion, FDI Statistics.

2.2 Duration of Evaluation Study

This ex-post evaluation study was conducted during the following schedule.

Duration of the Study: August 2017 - January 2019

Duration of Field Study: November 13 - 25 and December 9 - 22, 2017, and June 17 - 26, 2018

3. Results of the Evaluation (Overall Rating: A⁵)

3.1 Relevance (Rating: ③⁶)

3.1.1 Consistency with the Development Plan of India

In its *10th Five Year Plan (2002-2007)*, India set a goal to raise the rate of area covered by forests and trees⁷ up to 25% by the end of the tenure of the Plan⁸. The *10th Five Year Plan* has proposed recovery of degraded forests, sustainable forest management through joint forest management (JFM), and providing support for securing alternative incomes for local residents who are dependent on forests⁹. Since the Plan considered the conservation of biodiversity as a priority issue, this project was also designed to conserve biodiversity in the Western Ghats¹⁰.

National policies in the forest sector is the *National Forest Policy (1988)*, which set a goal for 1/3 of the national land area to be covered by forests and trees. The government of India has also emphasized the need to protect wildlife and areas critical for biodiversity under the *Biological Diversity Act of 2002* and the *National Environmental Policy of 2006*.

In the *10th Five Year Plan of the State of Karnataka (2002 to 2007)*, the recovery of degraded forest has been specified as one of the issues having the highest priority, and the degraded forests that were previously not covered by the Eastern Karnataka Afforestation Project were identified as the area to be covered by this project¹¹.

At the time of ex-post evaluation, the government of India had set a goal for forest and tree cover rate to reach 33% by the end of the *11th Five Year Plan (2007-2012)* and stated the conservation of biodiversity to be important in the section of the Plan dealing with sustainable environment. While a target ratio of the land to be covered by forests and trees is not specifically defined in the *12th Five Year Plan (2012 - 2017)*, the Plan lists forest management and enhanced greening through Joint Forest Planning and Management (in Karnataka JFM is termed as JFPM, herein after referred to as JFPM) by village forest committees (VFC) as well as strengthened forest management at the district level.

The *11th Five Year Plan of the State of Karnataka (2007-2012)* places emphasis on forest conservation, improvement of productivity in forestry, and conservation of biodiversity. The

⁵ A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

⁶ ③: High, ②: Fair, and ①: Low

⁷ A forest is an area (over 1 ha) having a collection of trees where the crown rate is 0.1 and over 0.1 (10%). A crown is a part of the tree that is beset with branches and leaves. A group of trees whose crown rate is less than 0.1 is called a scrub, and a scrub is not classified as a forest. A forest whose crown rate is between 0.1 and 0.4 is called an open forest. A forest whose crown rate is 0.4 and over 0.4 was referred to as a dense forest at the time of the project appraisal, but dense forest was further subdivided into moderately dense forest (crown rate is between 0.4 and 0.7) and very dense forest (crown rate is 0.7 and over 0.7) at the time of the ex-post evaluation. Forest cover rate is a ratio of combined open forest, moderately dense forest, and very dense forest areas, divided by a total geographical area. Crown rate is a ratio in which the area covered by trees with dense branches and leaves within a 1 ha range is divided by the geographical area. Therefore, crown rate and forest cover rate are different. Forest and tree cover rate is a sum of the forest ratio and a crown rate less than 0.1.

⁸ Ex-ante Project Evaluation Sheet.

⁹ Same as the above.

¹⁰ Same as the above.

¹¹ Same as the above.

12th Five Year Plan for the State of Karnataka (2012 - 2017) pledged to provide measures against the decline in the proportion of dense forests, planned tree planting for 73,000 ha of degraded forest through the Karnataka Forest Development Corporation (a part of the Karnataka Forest Department), and aimed to strengthen activities towards resolving conflict with the livelihood of the people that arise as a result of the loss of habitat for wildlife.

In light of the above, this project is consistent with the development policies of the government of India and the state of Karnataka both at the time of appraisal and ex-post evaluation.

3.1.2 Consistency with the Development Needs of India

At the time of appraisal, the state of Karnataka started the Eastern Karnataka Afforestation Project in 1997 and planted trees on 200,000 ha of degraded forests. However, since the burden on forests due to collection of fuel wood and grazing of livestock was still high, the remaining 450,000 ha of degraded forest that were not covered by the Eastern Karnataka Afforestation Project needed to be handled by this project in an attempt to recover forests¹².

At the time of appraisal, many people, including the poor, depended on forests to obtain livestock feed and fuel, and earn an income, and the burden on the forests were increasing due to an increase in population. As a result, it was in a vicious circle that, due to deterioration of soil and moisture conservation function, leading to a decline in groundwater level, the shortages of agricultural and drinking water occur, it was eventual threatening of the livelihood of the poor, causing, in turn, an excessive forest use beyond allowable amount for sustainable forest preservation. For this reason, simultaneously expanding the area of forest and improvements in the standard of living for those dependent on forests was an important tasks¹³. In order to cut off the vicious circle, it is important to supply sustainable forest products to 5.99 million poor in rural Karnataka and to support to secure alternative income, which would lead to not only for conservation of natural environment and water resources, but stabilization and improvement of the lives of local residents. Therefore, it was considered urgency and importance high.¹⁴

At the time of appraisal, the Western Ghats was among the most significant biodiversity hotspots¹⁵ in the world and in need of conservation of biodiversity¹⁶.

At the time of ex-post evaluation, trees were planted on approximately 180,000 ha of degraded forests through the project, which corresponded to 40% of the total area required for afforestation.

At the time of ex-post evaluation, trees were planted for fuelwood in order to reduce the amount of livelihood fuel collected from the forest by the poor, who were highly dependent on forest resources. In order to prevent them from earning an income by cutting timber, support was also provided towards the improvement of alternative sources of income for the poor.

Additionally, at the time of the ex-post evaluation, eco-development committees (herein after referred to as "EDC") were formed for the purpose of biodiversity conservation in the Western

¹² Materials provided by JICA.

¹³ Same as the above.

¹⁴ Same as the above.

¹⁵ Refers to regions where species are endangered or under the risk of destruction despite of a high level of biodiversity at a global scale. Certified by an international NGO, Conservation International (CI).

¹⁶ Materials provided by JICA.

Ghats, and they conducted activities that raise awareness on the protection of biodiversity and the environment. The elephant, an endangered species, forms the main focus of protection, and activities were undertaken to reduce the conflict between elephants and people, which involve capture and domestication of elephants that disturb farmlands. The number of elephants also increased through mating among the captured elephants.

Aside from the 180,000 ha where trees were planted under this project, 270,000 ha of degraded forests still remain. And while trees are being planted on 73,000 ha of degraded forest by the Karnataka Forest Development Corporation, which is a part of the Karnataka Forest Department. Since there are many devastated forests, the afforestation needs still remain.

The demarcation of roles with other donors are clear and do not overlap with each other. The Western Ghats Forest Project (1993 - 2002) by the UK Department for International Development (DFID) formed VFC and conducted tree planting by JFPM in the tree-planting districts not covered under this project. Of the Zones covered under this project, B Zone was an area not covered by the DFID project. Therefore, B Zone was designated as a project target area by the Karnataka Eastern Afforestation Project and then afforestation was carried out.

Development needs which were highly urgent at the time of appraisal were more satisfied by tree planting under this project than that of appraisal period, but the need for planting trees remained in degraded forests at the time of ex-post evaluation. However, the priority of this project and the regions selected by this project is said to be relevant.

3.1.3 Consistency with Japan's ODA Policy

Under the *Medium-Term Strategy for Overseas Economic Cooperation Operations (2002)* at the time of appraisal, priority areas in support to India were "regional development in which the poor receive benefit" and "improvement of the environment". In the *Country Assistance Strategy for India (2004)* the forestry sector was positioned as a major sector for support to India. The improvement of the quantity and quality of forests through the expansion of forest areas and a reduced open forest cover rate¹⁷, the sustainable supply of forest products and support for acquisition of alternative income to the poor highly dependent on forest resources leads to both conservation of the natural environment and water resources, as well as the stabilization and improvement of livelihoods among local residents, and these efforts were considered to be highly urgent and important from the perspective of measures against poverty¹⁸.

3.1.4 Appropriateness of the Project Plan and Approach

This project was afforestation project by using a community participatory method that tailored to forest conditions in state of Karnataka, especially, the poor who need fuel materials for daily life. The activities for planting trees and improving livelihood were conducted with the aim of preventing decrease of the forest cover rate and regenerating forest. Microfinance opportunities provided to the poor were supportive in improving the standard of living through enhancing income. From the viewpoint of biodiversity, it was appropriate as an approach that residents were organized, activities started, and biodiversity was conserved.

¹⁷ Crown rate is the area covered by trees out of a forest area, while an open forest is a forest whose crown rate is 10 or over 10-40%.

¹⁸ Materials provided by JICA.

In light of the above, the implementation of this project is consistent with the development policies of both India and the state of Karnataka. In terms of development needs, while the demand for afforestation in degraded forests remains, the project sufficiently matched Japanese aid policies, and the project plan and approaches were also appropriate. Judging comprehensively, it can be said that the relevancy is high.

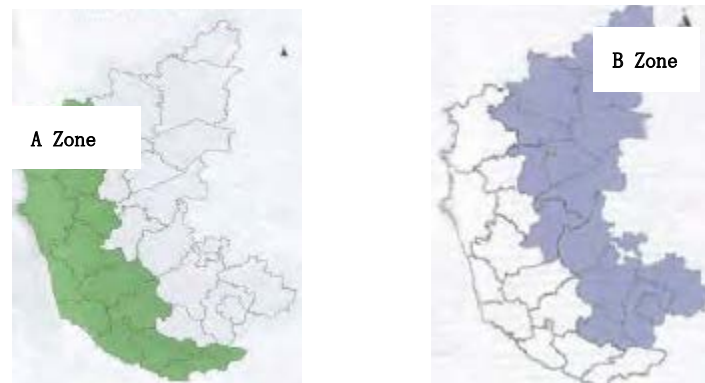


Figure 1 Districts in Karnataka Covered by This Project

Source: Provided by the executing agency.

Note) Differences between A Zone and B Zone is discussed in the Effectiveness section.

3.2 Efficiency (Rating: ②)

3.2.1 Project Outputs

3.2.1.1 Afforestation

Trees were generally planted as planned. Models 1 to Model 5 were models in which trees were planted on state-owned land managed by the Forest Department, and the seedlings were grown in nurseries by the Forest Department. The Forest Department and the VFC19 jointly planted the seedlings and protected growing trees. Upon advice from the Forest Department and NGO on technical and social considerations, a forest management plan called a microplan was formulated, and trees were planted based on this plan. For species of planted trees at the time of appraisal, seedlings of tree species requested by the residents were planted, if the soil condition, other planting conditions etc. are met.

In model 6, tree planting activities were implemented in schools under the National Rural Employment Generation Scheme, and some of the schools covered by the scheme were also covered by this project, which resulted in a narrowing down of the target schools to be covered by this project²⁰. For this reason, model 6 did not reach the goals set at the time of appraisal. Mangrove tree planting under model 7 measured planting area on-site at the time of appraisal, and the actual area did not reach the planned due to the fact that a measuring instrument like GPS was not used for accurate measurement.²¹.

¹⁹ Requirements for the establishment of a VFC are the willingness of at least 60% of villagers (one male and one female per household) to participate in a VFC in a planting village, and participation from at least 40 households from a settlement or a village in the VFC. A VFC must be no more than 2 km from a tree planting zone occupied predominantly by scrub, the area for planting must be 100-200 ha, and the planting site and the VFC village must be located within the same micro watershed. Establishment of a VFC is approved by the division office (from response to the questionnaire for the executing agency).

²⁰ From an interview with the Forest Department.

²¹ Same as the above.

Table 1 Afforestation by Model^{Note1)} (model 1 - model 7) (Unit: ha)

Model		Planned Area	Actual Area	Achieved %
Model 1 ^{Note2)}	Natural Regeneration Model	35,000	35,500	101
Model 2	Supplemented Natural Regeneration Model	50,000	51,659	103
Model 3	Timber Production Model	25,000	26,420	106
Model 4	Fuelwood Model	50,000	51,521	103
Model 5	Non-timber Forest Products Model	18,000	18,100	101
Model 6 ^{Note3)}	School Tree Planting Model	4,000	2,109	53
Model 7 ^{Note4)}	Mangrove Planting Model	3,000	1,815	61
Total		185,000	187,124	101

Source: Materials provided by JICA, responses to a questionnaire for the executing agency

Note 1) A model refers to a type of tree planting relative to the objective of tree planting, i.e. (fuelwood, timber production, and conditions in the target area (crown rate, soil conditions, rainfall, slope)). See Appendix 1 for the types of model.

Note 2) Selection criteria for planting areas from model 1 to 5 are different between A Zone and B Zone. See Appendix 1.

Note 3) Conducted by the Forest Department and school officials.

Note 4) Conducted by fishery officials and the Forest Department.

Plans for job creation were formulated at the time of appraisal to provide employment opportunities in tree planting and soil and moisture conservation projects. However, the number of people for whom jobs were created, as defined in the initial plan, was not achieved due to the fact that contractors perform the tasks using their own machines and personnel in instances where a tree planting contractor is selected through competitive bidding under the Karnataka Procurement Act (1999). However, since bidders were absent for remote areas, VFC members conducted tree planting and soil and moisture conservation activities. As shown in Table 2, the actual value was 77% of the target value defined at the time of appraisal. The target value was not achieved because this act was enacted during the Eastern Karnataka Afforestation Project (1999), and the target value should have been defined for the evaluated project by implementing this new law. However, the study was insufficient and appropriate consideration was not given, and the target value remained unchanged during this project. There were issues in terms of insufficient study and project supervision at the time of appraisal for both JICA and the executing agency.

Table 2 Planned and Actual Related with Job Creation by Tree Planting and Soil and Moisture Conservation Activity

	Plan	Actual	Achieved %
Jobs created (person / day) ^{Note)}	44,464,000	34,391,474	77%

Source: Materials provided by JICA, response to the questionnaire for the executing agency

Note) Total conversion for employment of a person a day (person/day)

Table 3 Activities for Participatory Afforestation Project

Activities for Tree Planting	Unit	Plan	Actual
Workshops, seminars, discussions (forests, agriculture, and livestock, water use, agroforestry, tree planting management, watershed conservation, etc.)	times	80	80
Preparation of pamphlets, posters and documents on success cases	no.	30	30
Participatory monitoring and evaluation for VFC (midterm, final)	times	4,000	4,000

Source: Materials provided by JICA, response to the questionnaire for the executing agency

Aside from models 1 to 7, there was also another model called model 8, which involved farmer forestry in which seedlings grown by the Forest Department were sold to individual

farmers²² to promote tree planting on privately owned farmland. According to the plan at the time of appraisal, distribution of seeds to farmers originally had the purpose of growing seedlings from seeds and transferring afforestation technology. However, the farmers were afraid of the loss of small seedlings due to livestock grazing etc. The farmers did not want to be distributed seeds and wanted the distribution of large seedlings that grew to a certain extent, so the number of seeds distributed was below the plan.²³ Regarding the damage caused by grazing of livestock and the appropriate size of seedlings, the Forest Department should have the experienced knowledge, and it seems to have been predicted from the time of appraisal, but the on-site needs of farmers' forestry was not sufficiently confirmed.

Table 4 Outputs for Individual Farmers

Model 8	Unit	Plan	Actual	Achieved %
Afforestation at the demonstration site	ha	2,150	2,165	1019
Distribution of seeds to farmers, etc.	ton	500	160	32
Distribution or Selling of seedlings (8"×12")	no.	1,000,000	1,000,000	100
Distribution or Selling of seedlings (5"×8", 4"×6")	no.	75,000,000	75,000,000	100

Source: Materials provided by JICA, response to the questionnaire for the executing agency

3.2.1.2 Livelihood Improvement Activities (Income Generation Activities)

VFC were provided with 400,000 rupees as incentive for JFPM activities over the course of two years after establishment, which were used for activities pertaining to the improvement of income for self-help group (herein after referred to as SHG)²⁴. SHG included new SHG for VFC formed at the start of the project and existing SHG formed in other programs in the past. Approval for the establishment of new SHG of VFC was given by division offices. When the management committee of a VFC approved, micro credits were also made available to existing SHG. Approximately 10% of the SHG were male and approximately 90% of the SHG were female²⁵.

Table 5 Number of VFC and SHG Newly Formed

	Unit	Plan	Actual	Achieved %
VFC	No.	1,200	1,222	102
SHG ^{Note)}	No.	6,000	6,066	101

Source: Materials provided by JICA, response to the questionnaire for the executing agency

Note) Data was not available on the existing number of SHG.

3.2.1.3 Biodiversity Conservation Activities

As a part of biodiversity conservation activities executed under this project, ditches were constructed to separate habitat conserved for elephants and other wildlife from the residences in nearby villages. The Forest Department has the Biodiversity Bureau, which is in charge of the management of national parks and wildlife sanctuaries as well as other activities for biodiversity conservation. Since the Bureau increased the area designated as wildlife

²² There is no subsidy system supported by the government.

²³ Influence on the cost due to changes in the output has not been verified (from a response by the Forest Department).

²⁴ Loans were provided normally with an interest rate ranging from 10% to 12%.

²⁵ *Impact Assessment Study of JICA Assisted Forestry Projects in the State of Karnataka, 2015*, the Forest Department. From 1222 newly formed VFC villages, a total of 30 villages were extracted from circle offices in proportion to the number of villages under the jurisdiction of each circle office.

sanctuaries²⁶, only areas for the improvement of habitat environment have increased in terms of a comparison between the planned value at appraisal and the actual value. .

3.2.1.4 Strengthening of Forest Management Capacity

(a) Monitoring and Evaluation

As noted in the plan submitted for the appraisal, a baseline study was conducted on livelihood by survey institutions and NGO in order to implement the project and perform post-project monitoring in an efficient manner, and *Project Implementation Manual 2015* was developed as planned, which includes detailed guidelines for livelihood improvement activities.

(b) Training

In order to implement the project efficiently and ensure sustainability after the completion of the project, a series of training sessions were conducted for the Forest Department staff, VFC management committee members, and NGO on tree planting techniques and Joint Forest Management, as shown in Table 6. The plan submitted for appraisal assumed the training session to be from one week to six weeks, but right after the start of the project, the executing agency shortened the training period to four days to accommodate VFC and SHG members, as detailed below. Training for forest guards, foresters, and village motivators were changed from four days to two days. These changes were appropriate since training sessions were accommodated to the livelihood of the people and ensure practicality of the training content. While skill training for improvement of livelihood was not planned initially, such training sessions were actually conducted due to a recognition of their need.

Table 6 Training for VFC, SHG and so on.

Training	Actual
VFC & SHG member training (4-day training) ^{Note1)}	1,635 sessions
Development of a microplan (village forest management plan)	200 plans
Training from community to community	165
Trainings for VFC representatives and managing committees	105
Training for NGO	4
Forest guard, forester, village motivator	15
Skills training for improvement of livelihood ^{Note2)}	1,500

Source: Materials provided by JICA, response to questionnaire for the executing agency

Note1) Long-term training sessions spanning a week to two weeks were planned at the time of appraisal.

Note2) The number of skill training sessions for improving livelihood were not defined at the time of appraisal.

(c) Expansion of GIS System

As detailed in the plan submitted for appraisal, a software for processing, analyzing, creating a database, web site making of topographic and administrative data was installed in the Forest Department headquarters to improve efficiency in selecting afforestation points and forest management. A software for accessing the database in real time was also installed in each local office. Overseas training on the geographic information system (GIS) and training session at the Forest Department on development of maps established in Eastern Karnataka Afforestation Project were also held. At the time of ex-post evaluation, a management information system (MIS) was developed using the funds for the Forest Department (which were not part of the fund for the project) to enable an electronic lumbering application. Development of these systems were achieved due to continuous support through the Eastern

²⁶ From an interview with the executing agency.

Karnataka Afforestation Project and this project²⁷.

(d) Infrastructure Development for On-site Staff

The construction of facilities for on-site staff and procurement of office equipment and facilities (computers, etc.) were completed generally as outlined in the plan at appraisal.

Project outputs were executed mostly as planned. In relation to the plan and actual, please see "Comparison of the Original and Actual Scope of the Project " at the end of this report.

3.2.2 Project Inputs

3.2.2.1 Project Cost

Total project cost at the time of appraisal was 18,477 million yen, of which 15,209 million yen was covered by ODA loan. Actual total project cost was 16,099 million yen, but the information could not be obtained in the details in foreign and local currencies. Actual cost covered by the ODA loan was 15,040 million yen²⁸, which was 99% of the planned ODA loan amount. In terms of the total project cost, the planned total project cost was 18,477 million yen while the actual cost was 16,099 million yen (87% of the planned cost). This is largely due to the fluctuation in the exchange rate. Actual cost covered by the executing agency was 1,025 million yen.

Table 7 Comparison of Plan and Actual Related with Project Cost (Unit: million yen)

	Plan ^{Note1)}		Actual ^{Note4)}	
	Total	ODA Loan	Total	ODA Loan
Afforestation	10,622	10,622	12,563 ^{Note3)}	12,563 ^{Note3)}
Income generation activities	468	468	584	584
Biodiversity conservation	308	308	302	302
Strengthening of forest management capacity	1,649	1,649	1,626	1,626
Price escalation	868	868	0	0
Physical contingency	696	696	0	0
Tax	7	0	0	0
General and administrative expense	3,261	0	1,025	0
Interest during construction	598	598	0	0
Total	18,477	15,209	16,099 ^{Note4)}	15,074 ^{Note4)}

Source: Planned cost from materials provided by JICA, and actual cost from the response to the questionnaire for the executing agency

Note 1) Exchange rate: foreign currency 1 USD=109 yen, local currency 1 rupee = 2.40 yen: price escalation rate: foreign currency 1.4 %/year, local currency 1.8 %/year: physical contingency rate: 5.0 %: period for cost estimation: August 2004.

Note 2) Exchange rate (actual): (average exchange rate between March 2005 and March 2015 is 1 USD = 101 yen), and 1 rupee = 2.10 yen. Final actual cost reported by the executing agency may be different from the amount reported by the Japanese side since the executing agency had converted to yen every month.

Note 3) Actual cost is larger than the planned cost since physical contingency and price escalations are taken into account.

Note 4) The total does not necessarily match because a value below one million yen is rounded down for each project cost. Cost accounted by the ODA loan in this table is the actual cost reported by the executing agency, which is different from the actual cost reported by JICA.

3.2.2.2 Project Period

The project period lasted from March 2005 (L/A signed) to March 2015, which was 10 years and one month, or 121 months²⁹. The project was designed to end in March 2013, in other words, in eight years and a month or 97 months³⁰, but the actual duration was 125% longer than the

²⁷ From a response by the staff in charge of information management at the executing agency.

²⁸ From materials provided by JICA. 15,074 million yen according to the materials provided by the executing agency.

²⁹ Responses to the executing agency questionnaire.

³⁰ The ex-ante evaluation sheet.

planned duration.

Definition of the project completion was not mentioned in official documents, thus the evaluator assumed it, based on the JICA provided documents and through discussions with the executing agency, as the time of completion of supplementary planting activities and biodiversity conservation activities³¹. While some research studies were still underway at the end of FY2014, essentially all the planned activities had been implemented and the project was considered complete at the end of fiscal year FY2014³². The periods for supplementary planting and tree planting were longer than planned because tree planting was continued as a result of reduction in total project cost owing to the influence of the fluctuation in exchange rate during the project period and the use of those funds on tree planting and supplementary planting³³.

Table 8 Comparison of Plan and Actual Related with the Project Period

	Planned Period	Period (months)	Actual Period	Period (months)
■ Afforestation				
Planting trees	2005/3 - 2009/3	49	2005/6 - 2012/3	82
Supplementary planting	2006/3 - 2013/3	85	2006/6 - 2015/3	106
■ Income generation activities	2005/3 - 2010/4	62	2005/6 - 2015/3	118
■ Biodiversity conservation	2005/3 - 2013/3	97	2005/6 - 2013/3	94
■ Strengthening of forest management capacity				
Monitoring and evaluation	2005/3 - 2010/3	61	2005/6 - 2013/3	94
Training and study	2005/3 - 2010/3	61	2005/6 - 2015/3	118
Expansion of GIS system	2005/3 - 2010/3	61	2005/6 - 2010/3	58

Source: Materials provided by JICA, response to the questionnaire for the executing agency

3.2.3 Results of Calculations for Internal Rates of Return (Reference Only)

The financial internal rate of return and economic internal rate of return for the afforestation project were calculated based on the method defined at the time of appraisal. Similarly, environmental impact was also calculated using estimation items defined at the time of appraisal.

Table 9 Internal Rate of Return of Project

	Financial Internal Rate of Return (FIRR)	Economic Internal Rate of Return (EIRR)
At Appraisal	9.8 %	13.7 %
At Ex-post Evaluation	10.3 %	13.7 %
Cost	Planting and soil conservation, forest management, infrastructure development for the Forest Department, dissemination and training, maintenance costs	Planting and soil conservation, forest management, infrastructure development for the Forest Department, dissemination and training, maintenance costs
Benefit	Revenue by sales of forest products	Increased amount of forest products, water source protection, income from agriculture, environmental effect.
Project Life	30 years	30 years

Source: Materials provided by JICA, response to the questionnaire for the executing agency

Note) Since the project cost was calculated at the time of appraisal without taking price escalation into account, this calculation is also performed without considering the price escalation.

³¹ Result of discussion with the executing agency at the time of the on-site study.

³² Activities for strengthening VFC activities were conducted by NGO between April 2013 and September 2014. This was conducted using local currency, given that the total project cost was reduced due to influence of the fluctuation in the currency exchange rate during the project period.

³³ Response by the executing agency.

The financial internal rate of return was 10.3%, since the profit, which is the fees collected, was large based on conversion from the values of timber and NTFPs of the forests in Karnataka based on benefit-allocation ratio for the Forest Department and VFC. The economic internal rate of return was 13.7%, which was the same as the rate at the time of appraisal.

In light of the above, the project cost is mostly within the planned, but the project period was exceeded by 24 months than original plan. Outputs were implemented mostly as planned, but job creation by tree planting did not reach the target specified in the plan because of a constraint imposed by the procurement act of the state, and the research plan at the time of appraisal required a longer period of time than originally planned. Therefore, the efficiency is judged as fair.

3.3 Effectiveness (Rating : ③)

3.3.1 Quantitative Effects (Operational and Effects Indicators)

3.3.1.1 Planted Area, Number of Planted Seedlings, and Survival Rate (Operational Indicator)

As shown in Table 10, indicators for tree planting were mostly achieved in this project. Since there were no other tree planting projects, it is considered these changes were mainly due to tree planting activities conducted jointly by the Forest Department and VFC. As shown in Table 11, the survival rate of the planted trees was 68% at the time of ex-post evaluation, which is not the target level. While this is likely because of the fact that the survival rate was not set properly, high survival rate at the time of ex-post evaluation indicates afforestation is in a favorable state.

Table 10 Comparison between Plan and Actual Related with Plantation in Target Villages

Indicator Name	Target Value (2015)	Actual Value (2015)	Achieved %
	Completion Year	Completion Year	
Planted Area	185,000 ha	187,085 ha	101 %
Number of Planted Trees (Excluding Farm Forestry)	147,120,000	146,464,171	100 %
Number of Planted Trees (Farmer forestry)	15,955,947	16,869,885	106 %
Number of Supplementary Planting	18,390,000	18,390,000	100 %

Source: Ex-ante Evaluation Sheet. Materials provided by the executing agency, response to the questionnaire for the executing agency

Table 11 Survival Rate of Planted Tree in Target Villages^{Note1)}

Indicator Name	Target Value ^{Note2)} (2019)	Actual Value (2015)
	6 Years After Completion	Completion Year
Survival rate of planted trees	75 %	68 %

Source: Ex-ante Evaluation Sheet, response to the questionnaire for the executing agency.

Note1) Trees planted by supplementary planting are counted in the survival rate. Survival rate is defined in India as the rate against the number of planted seedlings.

Note 2) The survival rate being lower than the target value for 2019 (target value defined at the time of appraisal) is understood to be due to the influence of a drought (rainfall was 10% or more lower than average) that continued between 2007 and 2015 in B Zone (from response to the questionnaire for the executing agency).

3.3.1.2 Changes in Forest Cover Rate in the Target Districts (Reference Indicator)

Forest cover rate is a rate of the area covered by forests out of the total land area, and the

cover rate shown in Table 12 is cited from the *India State of Forest Report*³⁴ for districts covered by this project. On this satellite data, observation on urbanization and other commercial afforestation areas, the area of agricultural crops regarded as forest, reduction of forest burden by using LPG, etc. is not comprehensively calibrated. Since it is not the forest coverage rate that specifically identified the afforestation area of this project, it is treated as a reference indicator and is not included in the evaluation.

Table 12 Forest Cover Rate (Reference Indicator)

Indicator Name	Forest Cover Rate (2005)	Forest Cover Rate (2015)	Increase in Forest Area 2005⇒2015
	Project Start Year	Completion Year	
A Zone ^{Note1)}	39.0 %	40.0 %	727 km ² (72,700 ha)
B Zone ^{Note2)}	6.5 %	7.0 %	483 km ² (41,800 ha)

Source: Forest cover rate by the *India State of Forest Report*

Note1) A Zone: 2006-2015 2,015 mm/ average annual rainfall

Note2) B Zone: 2006-2015 697 mm/average annual rainfall

A Zone includes the Western Ghats region where rainfall is abundant, and this region has a favorable condition for a natural increase in forest cover rate. As shown in Table 13, forest area of scrub in A Zone has decreased by 2.4% while the area of open forest has increased by 10.8%. Dense forest has slightly decreased by 1.1%. However, because the Forest Department pointed out that there were changes in the form of land use in agriculture and resort development sites among the forest areas, it is difficult to simply judge the factors affecting decrease and increase of forest cover rate (those of open forest).

Table 13 Changes of Forest Area in A Zone (Reference Indicator) (unit: km²)

Indicator Name		Plan (2004)	Actual (2017)	Changes in Area	Rate of change
		Appraisal	Ex-post Evaluation		
Crown density	Scrub (0-less than 10%)	884	863	-21 km ²	-2.4 %
	Open Forest (10 or over 10%- less than 40%)	9,141	1,0125	984 km ²	10.8 %
	Dense forest (40 or over 40%)	21,080	20,844	-236km ²	-1.1 %

Source: Forest cover rate by the *India State of Forest Report*

Unlike A Zone, B Zone is a region where agriculture alone cannot sustain a livelihood due to its soil quality (laterite soil, black cotton soil, etc.) and insufficient rainfall amount. Therefore, lots of migration of labor to cities and the Western Ghats takes place.

B Zone is also affected by a drought that lasted from 2007 to 2015 (rainfall was 10% or lower than average)³⁵. Scrub areas expanded in districts in central parts of the state and in Bengaluru city and its surrounding rural areas and are increasing slightly even in prefectures in suburbs of Bengaluru. Open forest has increased by 11% (440 km²). The majority of this increase was due to an increase of 342 km² in Tumkur district. Among the districts in B Zone, soil in Tumkur was suited to tree planting while afforestation activities were well taking place, leading to an

³⁴ Data from the executing agency, which is based on the Indian satellite data.

³⁵ Information from the executing agency.

increase in open forest. Dense forest (including very dense forest) decreased by 1.8%.

Table 14 Changes of Forest Area in B Zone (Reference Indicator) (unit: km²)

Indicator Name		Baseline (2004)	Actual (2017)	Changes in Area	Rate of change
		Appraisal	Ex-post Evaluation		
Crown Density	Scrub (0 - less than 10%)	2,267	2,328	61 km ²	2.7 %
	Open Forest (10 or over 10% - less than 40%)	4,012	4,452	440 km ²	11.0 %
	Dense forest (40 or over 40%)	1,018	1,000	-18 km ²	-1.8 %

Source: Forest cover rate by the *India State of Forest Report*.

3.3.1.3 Improvements on the Standard of Living

As shown in Table 15, annual household income has increased by a certain amount through micro credit activities according to an evaluation conducted by the executing agency at the time of project completion, but whether "a 10% increase in the income of farming households in target villages", which was one of the targets defined at the time of the appraisal, has been achieved or not is not verified quantitatively³⁶. Standard of living in VFC villages itself cannot be qualitatively regarded as due to an impact purely from this project because regional total production value has been pushed up in general, but as detailed in "3.3.2.2 Improvements on the Standard of Living" for qualitative impact, an improvement on standard of living has generally been confirmed through the study.

Table 15 Increase in Annual Income of Households^(Note) by Micro Credit Activities

Annual Income Increase for Households	No. of Respondents	Ratio
30,000 rupees or more	435	22 %
20,000 rupee or more– less than 30,000 rupees	637	33 %
less than 20,000 rupees	872	45 %
Total	1,944	100 %

Source: *Final Review and Evaluation, 2015* Forest Department

Note) The survey from the *Final Review and Evaluation*, which is the source of this table, is a result of a survey of VFC in 122 villages in A Zone and B Zone. The report states that villages were sampled randomly in a number proportional to the number of villages in each district, but the report does not specify the method of random sampling. This survey conducted a household survey for 1,944 households, and included farmers, self-employed, and other employed families in 472 SHG within surveyed villages. Classification of social hierarchy of surveyed households showed that 30% were scheduled tribes (ST) and scheduled caste (SC), 19% were backward class, and 54% were others.

Examples of businesses that utilized micro credit are as follows.

Table 16 Examples of Businesses that Used Micro Credit (Unit: %)

Type	
Dairy, poultry, sheep, fishing, etc.	48 %
Agriculture	49 %
Retail	1 %
Dressmaking	2 %
Total	100 %

Source: *Impact Assessment Study of JICA Assisted Forestry Projects in the State of Karnataka, 2015* Forest Department; see footnote No.25 for method of extracting villages

In order to conduct these businesses, some have borrowed from other financial institutions

³⁶ This household income is compared based on the baseline study at the start of the project (from the response by the executing agency). This baseline study was conducted at the start of the project with an NGO and led by division and range offices of the Forest Department. Studies took place during the development of the microplan at each village.

or lenders. The repayment rate of micro credit by SHG is 54%³⁷. Such a low repayment rate is suspected to be largely due to a lack of clear standards for assessment for loans. In actual lending, loans were provided based on an evaluation of loans and skills useful for improving income (existing skills and new skills acquired through skills training implemented by this project) based on past repayment records. Penalties for SHG members who failed to repay the loans were to be predefined by SHG. Penalties for cases in which SHG fail to repay VFC were to be determined by the VFC management committee³⁸.

3.3.2 Qualitative Effects

3.3.2.1 Regeneration

Two villages out of 804 VFC villages in A Zone were visited at the time of ex-post evaluation, but forest regeneration was making progress in all of the plantation areas in villages. At Venugopalaswamy village in Kolar, for the purpose of forest conservation, trees were planted to forest scrub areas and activities were implemented for the protection of seedlings by VFC residents, which specifically included the appropriate management of livestock³⁹ and strengthening of a prohibition against entering the afforestation area for several months following planting⁴⁰. These villages also reinforced reporting duties by residents to the Forest Department on forest fires and illegal logging, activities that were likely a cause of reforestation. Three out of 418 VFC villages were visited for B Zone, of which one village was making progress on reforestation. This is largely due to the soil quality and rainfall in B Zone, but is also due to the fact that afforestation was planned without consideration of drought periods. At the village of Ganjigatte in Chitradurga district, where reforestation was not making progress, an absence of VFC residents due to seasonal labor migration during draughts⁴¹ led to free-grazing livestock entering the afforestation area in search of grass and water, damaging the seedlings and likely preventing reforestation from making a progress⁴². Trees could have been protected if taller seedlings that have grown to some extent were distributed to places in which rainfall is limited⁴³.

³⁷ *Impact Assessment Study of JICA Assisted Forestry Projects in the State of Karnataka, 2015*, the Forest Department.

³⁸ *Project Implementation Manual*, the Forest Department.

³⁹ Penalties include leashing and preparation of fodder for cows, enforcement of limits to range of grazing by goats and sheep, etc., for the purpose of protecting the environment.

⁴⁰ An example is the VFC village in Anabur Navagram, Davanagere district, in B Zone, and VFC village in Baruve, Shivamogga district, in A Zone.

⁴¹ As noted earlier, there was an impact from a prolonged drought (i.e. rainfall was lower than the average by at least 10%) which continued from 2007 to 2015 in B Zone.

⁴² From an interview..

⁴³ From an interview with a staff from the Forest Department in Chitradurga district.

		
<p>Plantation area cleared at the time of planting (Mulur, Kolar) November 2006 (Region with an annual average rainfall of 883 mm)</p>	<p>Red sandalwood grown in the planting area on the left (Mulur, Kolar) June 2018</p>	<p>Trees in the plantation area on the left (Mulur, Kolar) June 2018</p>

According to an interview with the Forest Department staff⁴⁴, government policy for introducing LPGs led to an introduction of LPG in over half of the VFC households in A zone and about 30% of households in B Zone. This policy may have caused a decline in the use of fuelwood from forests, which may have influenced regeneration of forests in both A Zone and B Zone.

3.3.2.2 Improvements on the Standard of Living

While the pure impact of this project cannot be measured quantitatively due to the influence of the development of the local economy for more than 10 years, improvement in rural infrastructure, and improved income through migrant labor. At the ex-post evaluation, out of the visited villages

there were the two villages of Anabur Navagram VFC village and Venugopaldaswamy VFC village where an improvement in livelihood was observed through this project. Residents who needed loans to cover the repair cost for their homes prior to the beginning of this project were now in need of loans for the education and marriage of their children, and were at a stage where they were wanting a livelihood with an even higher standard of living⁴⁵. The final review study and the impact study conducted by the Forest Department have also shown cases in which micro credit by SHG groups at VFC villages⁴⁶ in A Zone were able to allow villagers to earn a stable revenue through dairy businesses⁴⁷. In terms of nutritional improvement, interviews have also revealed that groups and individuals who participated in dairy and other income improvement activities also experienced an increase in the amount of dairy products their families consumed⁴⁸. Some EDC members also noted that water storage tanks, deep well digging, and installation of roads for better access to villages have led to an improvement in the living environment. Further evidence and studies are needed to verify a causal relationship for questions pertaining to incomes improvement only by this project, which are tailored to forest regeneration and improvement on the standard of living.

⁴⁴ From interviews with state-level and division-level staff.

⁴⁵ Baruve village, Shivamogga district. Venugopaldaswamy village, Kolar district.

⁴⁶ Baruve village, Shivamogga district. Venugopaldaswamy village, Kolar district.

⁴⁷ *Impact Assessment Study of JICA Assisted Forestry Projects in the State of Karnataka, 2015*, the Forest Department. *Final Review and Evaluation, 2015*, the Forest Department.

⁴⁸ Baruve village, Shivamogga district. Venugopaldaswamy village, Kolar district.

3.4 Impacts

3.4.1 Intended Impacts

3.4.1.1 Impacts on Poverty Reduction

Since the raising of the groundwater level and soil conservation through the effects of afforestation and soil and moisture conservation are crucial to agricultural income, an impact on the groundwater level and agriculture will be discussed first among items for reduction of poverty.

(1) Rising of the groundwater level and soil conservation

The rising of the groundwater level was observed mainly in districts in A Zone, but since information on the ratio of VFC where groundwater level either increased or did not change was not obtained⁴⁹, a comprehensive evaluation on groundwater level is not possible. However, according to the final review report by the Forest Department in 2015, some VFC experienced a significant change before and after the project, as shown below. Information on groundwater level was not obtained about the districts of B Zone. Table 17 shows cases of VFC villages where a positive change was observed in terms of groundwater level.

Since the period after afforestation is not long, the rise in the groundwater level is mostly considered to be the influence of the civil engineering work of soil and moisture conservation such as check dam construction and so on.

Table 17 Pumped Discharge from the Deep Well and Changes in the Groundwater Level in A Zone (Unit:feet)

Name of the District and VFC	July - December		January - June	
	Before 2004	After 2015	Before 2004	After 2015
VFC at Mahadevnagar, Mysore				
Pumped discharge ^{Note1)} ^{Note2)} (m3/h)	7.57	9.46	5.68	6.81
Water level from the ground	125.00	120.50	135.00	127.50
VFC at Kuthyadka, Mangalore				
Pumped discharge (m3/h)	8.52	11.36	7.00	8.14
Water level from the ground	207.50	200.00	217.50	210.00
VFC at Yellambalse, Chikumagare				
Pumped discharge (m3/h)	7.57	9.46	-	-
Water level from the ground	250.50	237.50	-	-

Source: *Final Review and Evaluation, 2015*, Forest Department

Note1) With regards to the groundwater, there is a limit to deep well digging and pumped discharge due to an ordinance by the state government, which provides permission-based regulation on excessive use of groundwater for cash crops and excessive pumping for industrial use. Because the limit by this license system minimizes the impact on the water level of the groundwater by other factors, this table is generally representative of the impact of this project.

Note 2) Regarding the rainfall amount of each site before and after the project, there was no description in the source.

A general trend in soil quality could not be compared since this project did not measure soil pH and soil carbon content before and after the project, but in Baruve village in Shivamogga district in A Zone, soil nutrient runoff and soil erosion was prevented by a soil and moisture conservation facility and rooting of planted trees⁵⁰. Due to limited rainfall, some of the incoming information noted that a significant impact of soil and moisture conservation was not observed in B Zone⁵¹.

⁴⁹ This is because not all transitions for VFC villages were being monitored. It is also because the study also investigated only a portion of VFC (from a response by the executing agency).

⁵⁰ From an interview with VFC members in A Zone.

⁵¹ From an interview with VFC members in B Zone.

(2) Impacts on agricultural and non-agricultural activities

Through this project, some VFC villages experienced impacts from soil and moisture conservation and a rise in groundwater level, which resulted in diversification of planted crops⁵². While crops were traditionally limited to ragi, sorghum, and maize, some have reported that carrots, onions, ginger, cotton, and mulberry leaves are now being planted⁵³. Diversification of crops was also reported in villages where rice was the main crop, expanding their crops to areca nuts, flowers, legumes, medical herbs, and spices⁵⁴. The increased number and diversity of planted crops likely led to the increase in income. Income related to agriculture is greatly affected by the weather in B Zone and it resulted in many men and young people migrating elsewhere for labor during seasons with poor rainfall, while women raising children and elder villagers engaged in non-agricultural income improvement activities which can be conducted, including the production of mulberry and silkworms, and income-improving activities involving hoyia fibers (a succulent plant used as a raw material for ropes) due to the limited rainfall, the agricultural cropping items are limited. An impact on agriculture could not be confirmed for B Zone, but a positive impact towards non-agricultural activities were confirmed⁵⁵.

3.4.1.2 Biodiversity Conservation

An initial plan for biodiversity conservation was designed that included four wildlife sanctuaries, but interest in biodiversity by the executing agency increased after the project started, and 12 wildlife sanctuaries were added to the project⁵⁶. As Table 18 shows, some changes were observed such as an increase in the number of species in wildlife sanctuaries where EDC are active. Underlined parts are the impacts caused by this project.

Table 18 Changes in Number of Endangered Species in Biodiversity Risk Zone

Wildlife Name (Binomial Name)	Number (Year)	Number (Year)
Tigers (<i>Panthera tigris</i>)		
Within Karnataka	290 (2006)	406 (2014)
Wildlife sanctuary (Shivamogga district) ^{Note1)}	7 (2005)	<u>13 (2015)</u>
Elephants (<i>Elephas maximus</i>)		
Within Karnataka	4,347 (2005)	6,068 (2016)
Wildlife elephant sanctuary (Shivamogga district) ^{Note2)}	1 (2005)	<u>3 (2015)</u>
Tamed elephants (Shivamogga district)	18 (2005)	21 (2015)

Source: Response to a questionnaire for the executing agency

Note1) This wildlife sanctuary (Shettihalli Wildlife Sanctuary) is covered by EDC activities.

Note2) Of the three elephant wildlife sanctuaries in the state of Karnataka, this elephant sanctuary is located in Shivamogga district. This is a sanctuary covered by EDC activities.

Because the number of individual elephants increased, four elephants were donated from Karnataka to the state of Uttar Pradesh, which are being utilized for educational activities on biodiversity and protection of the forest environment within the sanctuary⁵⁷.

⁵² Baruve village, Shivamogga district, and Venugopalswamy village, Kolar district, in A Zone.

⁵³ Same as the above.

⁵⁴ Baruve village, Shivamogga district. Venugopalswamy village, Kolar district, etc.

⁵⁵ Anabur Navagram village, Davanagere district, in B Zone, etc.

⁵⁶ From a response by the executing agency.

⁵⁷ From information provided by members of an EDC for wild elephant sanctuaries.

3.4.1.3 Improved Awareness for Forest Conservation among VFC Residents

Residents contribute to the improvement of the natural environment through participation in afforestation and forest conservation activities, and receive practical benefits in the form of improved standard of living. For this reason, residents are engaging in surveillance through VFC activities for illegal grazing, logging, and capture of wildlife⁵⁸. The number of reported forest fires is also declining due to an awareness for the importance of preventing fires and reporting fires to the Forest Department, as shown on Table 19. Through this project, improved awareness of forest and nature protection among residents is evident.

Table 19 Forest Fire Incidences

Items	2012	2013	2014	2015
Number of incidences ^{Note1)}	713	606	431	295

Source: Response to a questionnaire for the executing agency

Note1) Combined number of cases for A Zone and B Zone.

3.4.1.4 Changes in Socio- economic Activities of Women's Participation in VFC and SHG

One male and one female member of a household are required to participate in a VFC, which has raised the number of officials of the VFC management committee⁵⁹, and ratio of women among members as compared to Eastern Karnataka Afforestation Project. Detailed study of the village confirmed that, as a result, participation by women in decision-making on forest management increased, and the voices of the women are being reflected more in forest management⁶⁰. Information could not be obtained on the ratio of women in EDC.

Table 20 Ratio of Women among the VFC Executive Board Members and VFC Members

Item	Eastern Karnataka Afforestation Project	This Project
Ratio of women among executive board members	29 %	43 %
Ratio of women among VFC members	21 %	45 %

Source: *Impact Assessment Study of JICA Assisted Forestry Projects in the State of Karnataka, 2015*, Forest Department

3.4.2 Other Positive and Negative Impacts

3.4.2.1 Impacts on the Natural Environment

The undesirable effects on the environment were judged not to be serious, in consideration of sector, project, and regional characteristics as defined by the *JBIC Guidelines for Confirmation of Environmental and Social Considerations (April 2002)*. This project was also exempt from the requirement for the development of an environmental impact report under the local Indian law, and from obtaining approval on matters pertaining to the environment. A burden on the natural environment was not considered to be existent since agricultural chemicals and fertilizers were used appropriately, and indigenous species were used for tree planting⁶¹.

3.4.2.2 Resettlement and Land Acquisition

Neither resettlement of villagers nor land acquisition has taken place in this project⁶².

⁵⁸ From an interview with the Forest Department.

⁵⁹ A guideline for the management committee specifies that an equal number of male and female representatives need to be assigned as officers.

⁶⁰ Detailed study of villages in A Zone.

⁶¹ From the response to the questionnaire for the executing agency.

⁶² From an interview with the executing agency.

To evaluate and determine the effectiveness and impact of this project, operational indicators, effectiveness indicators, and impact were weighted as 40%, 40%, and 20%, respectively, and higher weighting was given to indicator items within each operating, effectiveness, and impact category if they should have had a particularly high weight.

Table 21 Attempts to Determine Effectiveness and Impacts

Evaluated Items (Weighting Ratio)	Item (Item in the Appraisal Report)	Achievement %	Weighting	Result ^{Note1)}	Evaluation Score	Evaluation Score × Weighting Ratio
Operational Indicators (40%)	Afforestation area	101	0.2	3	0.6	
	Planted trees (except farmer forestry)	100	0.2	3	0.6	
	Planted trees (farm forestry)	106	0.1	3	0.3	
	Supplementary trees (10%)	100	0.1	3	0.3	
	Survival rate of planted trees	Nearly achieved	0.2	3	0.6	
	Established VFC and SHG	101	0.1	3	0.3	
	Job creation	77	0.1	2	0.2	
Total Evaluation Score					2.9	1.16 ^{Note2)}
Effectiveness Indicator (40%)	Forest Cover rate of the forest in the target afforestation region (reference indicator)	N.A	0.5	2)	1	
	Production quantity/value of forest products	Commercial forest currently grown	0.2	3	0.6	
	Beneficiary forestry farmer revenue per one household	Achieved in most households	0.3	3	0.9	
Total Evaluation Score					2.5	1 ^{Note3)}
Impacts (20%)	Improved water environment and soil conservation	A Zone: Effective	0.3	2	0.6	
	Impact on agriculture	A Zone: effective	0.1	2	0.2	
	Conservation of biodiversity	Effective	0.2	3	0.6	
	Diversification of income generating measures	Generally effective	0.2	2	0.4	
	Improved nutritional standards	Partially improved	0.1	2	0.2	
	Promotion of participation in society by women	Effective	0.1	3	0.3	
Total Evaluation Score					2.3	0.46 ^{note 4)}
Overall Evaluation						2.62

Note 1) Scores were defined as: ③ : high, 80% or over 80% of the plan (2.4); ② : fair, 50 or over 50%-80% of the plan (1.5 - 2.4); and ① : low, less than 50% of the plan (less than 1.5).

Note 2) 2.9×0.4 (weighting ratio of operational indicators)

Note 3) 2.5×0.4 (weighting ratio of effectiveness indicators)

Note 4) 2.3×0.2 (weighting ratio of impacts)

As a result of the evaluation from a comprehensive viewpoint, this project was given a score of 2.62, which exceeded the rating of 80% (2.4) as defined in the plan, and therefore the project was highly effective and impactful.

In light of the above, the effectiveness and impact are high.

3.5 Sustainability (Rating: ③)

3.5.1 Institutional /Organizational Aspect of Operation and Maintenance

3.5.1.1 Forest Department

The Forest Department is the executing agency of this project⁶³, and manages trees planted by this project and provides guidance for operations and management of VFC. A part of the Forest Department is the Biodiversity Bureau, which manages national parks and wildlife sanctuaries and is in charge of conservation of biodiversity. This Bureau is responsible for EDC and provides operational guidance.

Structure for maintenance and management were confirmed at the time of ex-post evaluation with the range office, which reports on the state of afforestation and survival rate to division offices, the circle office, and implementation units of the state every month. The circle office has the jurisdiction over the field level and provides on-site monitoring and supervision. Document-based reporting is stipulated to be submitted every month, but in reality, reports are submitted every week, while matters such as fires and illegal forest activities are reported as needed.

The Forest Department handles all responsibilities on project activities, and its organizational structure has not changed since the time of appraisal. As shown in Table 22, division of scope for each of the offices is clear, structures for coordination and cooperation between different levels are well-established, and communication and reporting take place frequently.

Under the State Forest Department, which is the executing agency for this project, the evaluator found upon visiting offices at each level that a system of supervision, reporting, and command has been well-established at each level, including the circle office⁶⁴, division office, range office, section office, and beat office. The number of the Forest Department staff was 11,444 at the time of project completion on March 2015, which was reduced to 14,121 at the time of ex-post evaluation. According to the Forest Department, the institution plans to increase its staff to 18,836 by 2020 to enhance forest supervision by reinforcing on-site staff such as forest guards and forest watchers.

⁶³ During the period of project implementation, senior executive committee made decisions with the Minister of Environment and Forests as its chairman. In JFPM committee at the state level, the Principal Assistant Secretary of the State served as the chairman and the committee gave approvals for annual management plan within the state government and conducted monitoring. This committee was held once a year. Officer in charge of each division in the State Finance Department served as a chairman for the JFPM committee at division level, and gave approvals and monitored annual management plan within the state government. This was held once a month, and a report on project progress was submitted to the state once every half a year.

⁶⁴ Circle office is an office that manages three to six division offices.

Table 22 Forest Department Stakeholders and Their Duties (Actual)

Administrative Level	Duties	Main Officer and Staff in Charge	Reporting Structure
State Forest Department	Giving directions and supervising the entire state	<ul style="list-style-type: none"> • Principal Chief Conservator of Forest • Additional Principal Chief Conservator of Forest 	
Circle office	Supervising several districts	<ul style="list-style-type: none"> • Chief Conservator of Forest 	Quarterly reports to the State Forest Department
Division office	General management of the division, in charge of planting and forest conservation	<ul style="list-style-type: none"> • Deputy Conservator of Forest • Assistant Conservator of Forest 	Quarterly reports to the circle office
Range office	In charge of planting and forestry within the range	<ul style="list-style-type: none"> • Ranger • Forester 	Monthly reports to the division office
Section office	Supervision of planting and forestry in beat	<ul style="list-style-type: none"> • Forest Guard 	Monthly reports to the range office
Beat office	In charge of forests that cover multiple Panchayat Villages (24-hour structure)	<ul style="list-style-type: none"> • Watcher 	Monthly reports to the section office

Source: Developed based on an interview with the Forest Department

3.5.1.2 VFC and EDC

The management committees of VFC and EDC consist of 14 people. The executive committee consists of 10 people. These include two individuals each from SC, ST, landless farmers, village-level skilled artisan⁶⁵, and general residents where one is a male and the other is a female. In addition, four committee members are added and they include an accountant from the village administration, a secretary from the village administration, an NGO representative, and one member thoroughly familiar with agriculture and forestry. Management committees held meetings at frequencies ranging from once a week to once a month. According to the results of an impact study by the Forest Department, selection of a representative was conducted by an election in only 2% of the sampled 122 VFC villages, and the rest were by appointment⁶⁶. To the extent the study was able to confirm, representatives were exclusively male. At the time of visit for the field study, committees were able to secure an environment in which women could express their opinions by ensuring one male and one female were selected as members from each household and for the management committee, even if the representatives were males. At the time of ex-post evaluation, the Forest Department, with the support of NGO, was developing an updated version of the microplan⁶⁷ (village forest management plan) to revitalize activities by VFC and EDC.

⁶⁵ Artisans who produce products by processing NTFPs, etc. (*Project Implementation Manual 2015*).

⁶⁶ *Impact Assessment Study of JICA Assisted Forestry Projects in the State of Karnataka, 2015*, the Forest Department.

⁶⁷ The microplans are updating every ten years

Table 23 Division of Duties among Forest Department, VFC, and EDC (Actual)

Organization	Duties	Structure for Support and Coordination
Forest Department	<ul style="list-style-type: none"> • Patrolling facilities for soil and moisture conservation and planting areas in VFC • Checks on status and cost studies for maintenance, growth of trees, and NTFP • Permission for sampling of NTFP, etc. in the planting area 	<ul style="list-style-type: none"> • Requests budget for maintenance based on cost survey • If technical issues arise, support from the Forest Department Specialized Bureau
VFC	<ul style="list-style-type: none"> • Checking facilities for soil and moisture conservation and reporting to watchers and forest guards (as needed) • Reports on revolving funds for VFC (once a year) 	<ul style="list-style-type: none"> • Consults and sends requests for support to Forest Department staff in case of an issue
EDC	<ul style="list-style-type: none"> • Reporting to Biodiversity Bureau staff • Environmental education in local area and schools • Activities for the protection of forests and species • Securing revenue sources 	<ul style="list-style-type: none"> • Coordination with environmental events hosted by the government • Proposals and support for securing revenue sources • Support for administrative procedures

Source: Described by the author

3.5.1.3 System for Protection and Growing Trees

Afforestation areas for VFC have an access area where residents can obtain livestock feeds. While afforestation areas for VFC are generally managed by Forest Department staff with specialized knowledge of tree species, trees are planted on a private land in the case of farmer forestry, where buyers of seedlings are held responsible and farmers themselves handle supplementary planting, watering, and weeding.

The executing agency already has an established organizational structure, and a VFC/EDC system is formed as assumed at the time of appraisal through good coordination with the Forest Department. Therefore, the sustainability from institutional and organizational aspects is judged as high.

3.5.2 Technical Aspect of Operation and Maintenance

For technical skills among Forest Department staff, training sessions are held on tree planting techniques at various levels while management capabilities are also being enhanced⁶⁸.

Evaluation after Eastern Karnataka Afforestation Project deemed the progress insufficient in terms of participatory afforestation and forest conservation activities, and based on the lessons learnt, four NGOs were employed in this project to strengthen facilitation of guidance and training⁶⁹.

According to interviews at every level of the office of the Forest Department, NGO initially provided support for guidance and facilitation of training for management related to resident participation and micro credits, but Forest Department staff managed to learn guidance approaches by leading guidance on VFC activities alongside NGO⁷⁰. A manual on guidance

⁶⁸ From an interview with the executing agency staff.

⁶⁹ From an interview with the Forest Department staff.

⁷⁰ From an interview with the executing agency staff.

approaches was developed by this project and used in training sessions⁷¹. Except these things, a manual was developed in Kannada language on the maintenance of tree species and orchards⁷², which describes how they should be planted and maintained, and their benefits in the future through effective use. The manual was even used at the time of ex-post evaluation.

From a technical perspective, Forest Department staff possessed high levels of technical skills, and the department continues to actively develop GIS and MIS⁷³ under its own budget. Forest Department staff also acquired capabilities for managing VFC, and comprehensively their technical levels are judged as high.

3.5.3 Financial Aspect of Operation and Maintenance

3.5.3.1 Karnataka Forest Department

The State Forest Department has secured approximately budget of 11-14 billion rupees from FY2014/15 to 2016/17. The budget has also been secured for FY2017/18. The overall budget for the state government is 1.38 trillion to 1.63 trillion rupees. As shown in Table 24, the Forest Department has secured approximately 0.8% of the budget for the entire state, and meets the budget required for this project. According to the State Forest Department, its future maintenance budget is also expected to be secured. In the future, the budget of the Forest Department will emphasize forestry production in advantageous regions of Karnataka, and plans to turn these regions into future pillars for revenue⁷⁴.

Table 24 Budgetary Spending and Allocation for State Government and State Forest Department^(Note)
(unit: million Rs)

	FY2014/15	FY2015/16	FY2016/17	FY2017/18
State Government Budget: A	1,380,080.00	1,425,340.00	1,634,190.00	1,865,610.00
State Forest Department budget :B	11,648.60	12,581.30	13,995.60	14,191.40
B/A = %	0.84	0.88	0.85	0.76

Source: Response to a questionnaire for the executing agency

Note) The figures from FY2014/15 to FY2016/17 are the executed budget. The figures for FY2017/18 are the allocated budget.

3.5.3.2 Financials for VFC/EDC

The VFC received an accounting audit by a certified public accountant once a year. The results are reported to the staff member in charge of the division office.

At the Forestry Department Headquarters, about 30% of VFC are answering that activities are continuously and financially sustained. Financial resources for VFC are limited to the revolving fund, trees that can be logged and sold in a relatively short period such as acacia, and NTFPs that can be harvested and turned into a financial resource. Fifty VFC villages out of 1,222 VFC villages have earned an NTFP revenue of 6.7 million rupees by the time of the ex-post evaluation. Turnover of the revolving fund for VFC was 150% at the time of project completion (2015)⁷⁵. At the time of ex-post evaluation, some SHG were dormant due to the

⁷¹ Project Implementation Manual 2015, Guidelines for Income Generation Activities 2008, Care and Share 2011.

⁷² Custard Apples, Amla, Indian Gooseberry, Neem, Jackfruit, Tamarind, and Sandalwood and so on.

⁷³ An example is an electronic processing of approvals for cutting down forests.

⁷⁴ From an interview with the executing agency staff.

⁷⁵ Data provided by the Forest Department. Revolving fund for VFC had a generally high turnover for two to five years after the loan began, which reached a rate as high as over 250% in some cases (from an interview with the executing agency staff).

labor migration of their members⁷⁶.

The reason for the low repayment rate is that there are members who do not repay, and they will not repay in a chain reaction. It is also related to the fact that the establishment of penal provisions is left to a decision of each VFC · SHG.

As with VFC, EDC also receive an accounting audit by a public accountant once a year. Some groups have been able to utilize the entrance fee of elephant sanctuaries as a financial resource, and other groups have organized trekking routes and converted entrance fees and parking fees into a financial resource⁷⁷.

When there are sources of income, revolving funds for EDC reach a good amount and financial sustainability is secured. Of 73 EDC, it was confirmed that 10% of EDC have secured such sustainability⁷⁸. Even in cases where financial sustainability is lacking, some groups conduct EDC activities through volunteering. Environmental forest conservation and biodiversity conservation activities are areas that local schools and administrations have an interest in, and some EDC groups coordinate with these institutions to engage in various activities and events, etc. In some cases EDC groups are able to obtain financial resources from other organizations and administrations. While some EDC are dormant, other EDC are acting autonomously based on the purpose of the EDC activities, and most of them were in a state that they could continue them.

3.5.3.3 Allocation of Benefits

While the benefit allocation ratio was formulated as follows, permission for harvesting NTFPs is granted by range offices depending on the growth of the planted trees in the afforestation area. According to the executing agency, 50 out of 1,222 VFC villages have obtained a permission from the executing agency to capitalize on VFC under the following distribution of NTFP revenue at the time of ex-post evaluation. Since planted trees were still young, many VFC were not able to gain benefits yet.

Table 25 Benefit Allocation Ratio between Forest Department and VFC (policy) (unit: %)

Item	Forest Department	VFC
Non-timber forest products (NTFP)	10	90
Forest products VFC was involved in	25	75
Forest products produced before formation of VFC	50	50
Forest products naturally grown before formation of VFC	50	50
Forest products from trees in schools, etc.		
Leaves, fruits	0	100
Final harvests	25	75
Forest products from trees in lands managed by other departments, etc.	50	50

Source: Response to a questionnaire for the executing agency.

⁷⁶ From an interview result in Chitradurga district.

⁷⁷ From an interview result with staff of Forestry Department.

⁷⁸ Information provided by the executing agency and a result of visiting and verifying with EDC of the Gajanur Agrahara village in Shivamogga district by the evaluator. Since EDC is prohibited from collecting NTFP etc. from the forest, it is only inputs of revolving funds and infrastructure support activities at the beginning, so 90% EDC, together with the Forest Department, needs to take measures for EDC to secure financial resources.

As noted above, the Forest Department has a stable budget for the future, and plans to concentrate on forest conservation by increasing the number of staff for forest protection, thereby reducing the area to be covered by each staff member. The Forest Department is providing guidance to EDC and VFC to increase their revenues at the district and range office levels to secure financial resources for EDC and VFC even after completion of the project. However, given the limited number of EDCs and VFCs that can act autonomously⁷⁹, the overall state of operation and management of EDC and VFC is judged to be fair from a financial perspective.

3.5.4 Status of Operation and Maintenance

The format of the report is defined under the *Project Implementation Manual*, and range offices report to a division office once a month on the situation in plantation area. Seedlings that were wilted or damaged within few years after planting were replaced by supplementary planting. Watering depended on the rainfall in the area, but the trees were nonetheless watered continuously for several months after planting or supplementary planting⁸⁰.

Periodic grazing of grass by livestock was permitted in an access area within the plantation area, and feed was secured for livestock while the measures against livestock was undertaken.

Afforestation areas needed professional protection and supervision, and forest watchmen sent by the Forest Department monitored the trees 24 hours a day.

With respect to the growth of the forest, trees planted in intervals based on the rainfall of the region (i.e. water retention by the land) are growing, although there is some variability by area. In A zone, many plantation areas are protected by entanglements and metal fences, and seedlings and trees are growing without problems. On the contrary, B zone experienced insufficient livestock management while livestock owners were absent due to labor migration, and some regions reported forest disturbances by livestock seeking food and water in periods when rainfall was scarce⁸¹.

Maintenance and management of mud walls for soil and moisture conservation and prevention of livestock intrusion was to be performed by VFC, but on-site study showed that the Forest Department was to handle repairs that incurred costs, such as check dams⁸², fire belts, and Elephant Proof Trench (EPT).

Division offices manage plantation lands based on a working plan⁸³. The microplans were formulated with residents of VFC at the beginning of the project. The Forest Department has obtained a budget and an updating microplan is under developing.

Considering the measures taken to protect plantation area and the current state of soil and moisture conservation, overall operation and management was mostly favorable.

⁷⁹ From an interview with the Forest Department.

⁸⁰ From an interview with the Forest Department.

⁸¹ From an interview with the Forest Department.

⁸² A small-scale check dam facility built on a micro watershed for prevention of erosion.

⁸³ Working plan is formulated for 10-year forest conservation, regeneration of vegetation, and afforestation, and approved by the circle office and the Forest Department of the state, followed by an approval by the Ministry of Environment, Forest, and Climate Change.

In light of the above, the duties and responsibilities of each officer and staff are clear in terms of maintenance and management of afforestation, and the number of staff is on an increasing trend. The roles of VFC on maintenance and management and the roles of EDC on environmental conservation and protection of biodiversity were clear. Therefore, there are no issues in terms of the institution and organization. In terms of technical skills, the Forest Department staff at state, division, and on-site levels possessed forest conservation and tree planting capabilities, while VFC and EDC also held a high level of awareness and engagement in forest management and biodiversity and are capable of acting as a group. Financially, a necessary budget has mostly been secured from the state government and a budget is expected to continue to be secured in the future. There are some issues in terms of management and operation of financial resources for VFC and EDC. The status of the management of forests and plantations is generally favorable owing to the Forest Department and VFC. Some VFC and SHG are dormant, and the Forest Department and NGO hired by the Forest Department are stepping up their support for activities by VFC and income improvement for SHG. Overall, the sustainability of the project is judged high.

4. Conclusion, Lessons Learned and Recommendations

This project was implemented with the aim to restore the forests and improving the standard of living of the local residents through tree planting, livelihood improvement activities, and biodiversity conservation activities at the village level by a community participation approach, thereby contributing to the reduction of poverty and conservation of biodiversity in the state of Karnataka in Southwest India

This project is highly relevant since it is consistent with priority areas under the Indian development policy as well as the Japanese ODA policy, and matches the development needs. The efficiency is fair since the project cost is kept within the planned cost but the project period exceeds the planned duration. Trees were mostly planted as per the plan by this project, which has promoted the regeneration of forests. While the degree of contribution of this project towards the improvement of the local standard of living cannot be measured quantitatively, owing to the fact that other factors such as local economic growth have been pushing household incomes up, various impact studies and interviews have confirmed that target households have increased their annual income, at least through income from small scale business by micro credit implemented for a certain period in this project. It can be said that the effectiveness is high since the planted trees had a high survival rate at the ex-post evaluation and further regeneration of forest is expected from the growth of the planted trees. Impacts of the project include conservation of biodiversity, diversification of income generation, activities organized by the village forest committees and the encouragement of women' participation through income improvement activities. In light of these things, the effectiveness and impact of the project are judged as high. The operational and maintenance system of the executing agency is well established without any technical problems, and the state of maintenance is generally favorable. Some issues remain with respect to the management of village forest committees and eco-development committees from a financial perspective, however, overall the sustainability of the effect is high.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

None.

4.2.2 Recommendations to JICA

None.

4.3 Lessons Learned

Setting Appropriate Effectiveness Indicators

Indicators for the evaluation of project effectiveness at the time of the appraisal included survival rate, which was considered to be important for tree planting projects, but the target value for this indicator was set in 2019, six years after the completion of the project. Appropriate target year and target survival rates need to be defined by taking local climate, soil quality, tree species, and rainfall into account. Measurements need to cover across several plots and the data recording should be monitored by a third party. This is because the area for tree planting was

large and the survival rate may vary greatly depending on the location of where it is measured. Regarding the forest cover rate, the data available is only for the entire state or district level and no data related to the project target area existed. Therefore the evaluator had no choice but to use it as a reference indicator in judgment of evaluation. As regard to the indicator on the standard of living, the target value was set as an average increase in income by 10% for target households two years after the completion of the project. However, regarding this household average income increase, since there are other factors such as regional economic growth and migration labor, except those due to this project, the document at the time of appraisal was requested to set up these indicators and clearly show the measurement method. In order to enable an appropriate ex-post evaluation, it is crucial to assess operation and effectiveness indicators at the time of the appraisal with inputs from forest specialists who are thoroughly familiar with tree plantings in subtropical areas, and clearly note the approach for measuring these indicators. To set an appropriate indicator and target value for effectiveness is also crucial to overall project management as they are used during the project implementation and ex-post project monitoring. These things should be done by stakeholders at the time of the project formation, planning, and appraisal.

Tree Planting Seedling for Farm Forestry and Plantation in the Area of Scarce Rainfall

An objective of seed distribution to farmers in this project was to transfer the techniques for raising seedlings from seeds, but rather than that, farmers preferred distributing and selling of larger seedlings grown to some extent. They do so in fear of losing small seedlings by livestock grazing and so forth. This led to the distribution of smaller number of seeds than that of originally planned. In the future it is expected to distribute and sell larger grown seedlings than farmers wanted, considering the survival of seedlings. Not only for the seedlings for farm forestry, but also for planting seedlings in the plantation, especially in areas with low amount rainfall in B zone, large seedlings are needed. The size of seeds and seedlings based on the needs of seedlings for farm forestry and seedlings for plantation should have been surveyed in the field in advance. It is necessary to conduct an investigation through hearing from the people who are familiar with the field, such as the sites of seedling of the range office, the staff of the range office and so on. The results of these studies should be reflected in the plan.

Economic Development, Forest Protection, and Future Direction on JFM

Compared to the start of the project, the economic situation had changed by the time of ex-post evaluation. Rapid economic development has stimulated seasonal and migrant labor, and some VFC experienced a long-term absence of their members. The reality is that labor by family members in other regions is a significant source of income. In view of these changing circumstances, the approach to micro credits may be at a turning point and it needs to be reassessed through further studies. As a way of JFM (JFPM in Karnataka state), funds were granted to VFC which became an incentive for formation of starting JFM, and micro credit was conducted through the funds. Considering the low repayment rate of micro credit and existing dormant VFC and SHG, the future significance of micro credit needs to be reconsidered. Since the staff of the Forest Department is specialized in forest management and is not specialized in

small-scale finance, the livelihood improvement, poverty alleviation, and micro credit etc., they cannot manage them as the Rural Development Department has been doing. Proposals from staff of each level of the Forest Department were suggesting that NGOs can well manage the micro credit, by letting them do, Forest Department staff would be able to engage more in the original work. When micro credits are implemented, specialized lending and funding can be professionally managed by contracting out with NGOs owing to their plenty of experience. Micro credit under NGOs controlled by strict penalty provisions can be managed more effectively. The Forest Department, should concentrate on forest conservation, , management of forest plants and woods with high added values and work focusing on profitability from NTFP etc.by using their expertise in those fields. By setting those profits return to the village groups as an incentive for protecting forests, it is necessary to make forest protection by existing VFC more sustainable.

Project Supervision that meets the Karnataka Procurement Act and Establishment of Target Values

At the time of appraisal the plans for job creation were formulated to provide employment opportunities through tree planting and soil and moisture conservation projects. However, the amount of job creation targeted in the initial plan was not achieved because when contractors were selected by competitive bidding under the Karnataka Procurement Act (1999), they performed the tasks of tree plantation by using their machines and personnel. This Act was applied during the Eastern Karnataka Afforestation Project (1997), and employment issues of VFC arose during the Eastern Karnataka Afforestation Project. In view of the above, this should have been reviewed and specific countermeasures needed to be applied in this project. Investigations for the definition of target values were not well defined either. Furthermore the target values were not changed during the implementation of this project. The reason for this may have been that, the studies at the appraisal, and during the project supervision for both JICA and the executing agency were insufficient.. At the time of appraisal, specific issues during the implementation of the Eastern Karnataka Afforestation Project should be concretely pointed out, the opinions of the on-site staff on these issues should be confirmed at every level, and then the plan shall be developed accordingly.

Comparison of the Original and Actual Scope of the Project

Item	Plan	Actual
1. Project Outputs	(1) Planting project 1) Planted area 185,000ha 2) Number of planted trees (excluding farm forestry) 147,120,000 3) Number of planted trees (farm forestry) 15,955,947 4) Supplementary planting 18,390,000 5) Employment (day/person) 44,464,000 (2) Village Forest Committees established 1,200 (3) Self-Help Groups established 6,000 (4) Biodiversity conservation activities 1) EDC established 73 2) Fire belt established 2,206 mm 3) Preventive ditch for elephant intrusion 375 km 4) Improvement of habitat 3,750 ha (5) Forest management facility 1) Lodging for local staff 72 2) Office for local staff 23 3) Vehicles 100	(1) Planting project 1) Planted area 187,085ha 2) Number of planted trees (excluding farm forestry) 146,464,171 3) Number of planted trees (farm forestry) 16,869,885 4) Supplementary planting 18,390,000 5) Employment (day/person) 34,391,474 (2) Village Forest Committees established 1,222 (3) Self-Help Groups established 6,066 (4) Biodiversity conservation activities 1) EDC established 73 2) Fire belt established 2,144 mm 3) Preventive ditch for elephant intrusion 532 km 4) Improvement of habitat 7,036 ha (5) Forest management facility 1) Lodging for local staff 82 2) Office for local staff 23 3) Vehicles 100
2. Project Period	March 2005 - March 2013 (97 months)	March 2005 - March 2015 (121 months)
3. Project Cost	Amount Paid in 735 million yen Foreign Currency 17,742 million yen Amount Paid in (7,392 million Indian rupee) Local Currency Total 18,477 million yen 15,209 million yen ODA Loan 1 Indian rupee = 2.40 yen Portion (as of August 2004) Exchange Rate	N/A N/A (N/A) 16,099 million yen 15,040 million yen 1 Indian rupee = 2.10 yen (average between March 2005 and March 2015)
4. Final Disbursement	July 2015	

Appendix 1 Afforestation Model

Model	Crown Rate and Forest Type	Annual Rainfall	Soil Type and Topography	Period Up to Logging
Model 1: Ecological recovery through natural regeneration (Natural regeneration model)				
A Zone	25 % - 40 % Evergreen trees, semi-evergreen trees	over 2,500 mm	Laterite soil; red soil Upper part of hills and mountain slopes	Depends on the rotation of the planted species, but generally a long period ranging from 30 years to 60 years
B Zone	10 % - 40 % Deciduous trees, dry deciduous trees ((Trees whose leaves fall off in dry seasons))	600 mm to 1,200 mm	Black soil; red soil Site with abundant rocks and stones in the soil Loose or steep slope with poor access	
Model 2: Supports natural regeneration (Natural regeneration supplementary model)				
A Zone	10 % - 40 % Semi-evergreen trees, moist deciduous trees, dry deciduous trees	over 1,200 mm	Laterite soil; red soil Low topography with gentle or gradually sloped hill	Depends on the rotation of the planted species, but generally a long period ranging from 30 years to 60 years
B Zone	10 % - 25 % Dry deciduous trees	600 mm to 1200 mm	Black cotton; red soil; Gradual slope	
Model 3: Afforestation zone for timber production (Timber production model)				
A Zone	0 % - 10 % Moist deciduous trees, dry deciduous trees	1,200 mm to 2,000 mm	Laterite soil; red soil Gentle or gradual slope	Understood to be approximately 30 years
Model 4: Afforestation zone for production of fuelwood and small-diameter trees (Fuelwood model)				
A Zone	0% - 10% Shrub consisting of quite degraded, damaged, and sparse vegetation	over 1,200mm	Gradual slope with laterite soil	Understood to be approximately 8 years
B Zone	0 % - 10 % Thorny bushes	900 mm to 1,200 mm	Black cotton; red soil; laterite soil	
Model 5: NTFP ((non-timber forest products)) planting zone (Non-timber forest products model)				
A Zone	0 % - 25 % Moist deciduous trees, dry deciduous trees	1,200 mm to 2,500 mm	Laterite soil; red soil Gentle, gradual slope	Trees where only fruits can be harvested
B Zone	0 % - 25 % Dry deciduous trees; thorny bushes		Black cotton; red soil; laterite soil Gradual slope	
Model 6: Afforestation in schools (School tree planting model)				
A Zone and B Zone	Planted within the school ground			Approximately 8 years
Model 7: Regeneration of mangroves (Mangrove planting model)				
A Zone	No specific definition	over 1,200 mm	Alkaline swamps with high salinity, brackish water, river mouths and coasts along the watershed	No harvests
Model 8: Farmer forestry, farm forests, agro-forests (Agroforestry in which trees are planted and livestock and crops are raised and cultivated between trees)				
A Zone and B Zone	Distributes seeds and seedlings for farm forests and agro-forests for interested farmers and general residents			Depends on plant species, but eight years for fuelwood. A long rotation period for other species.

India

FY2017 Ex-Post Evaluation Report of Japanese ODA Loan Project
“Tamil Nadu Afforestation Project (II)”

External Evaluator: Noriyo Aoki, Alfapremia Co., Ltd.
Miwa Hayashi, Alfapremia Co., Ltd.

0. Summary

This project was implemented with the aim to regenerate forests and improve the standard of living of local residents by afforestation and livelihood improvement activities using the community participatory method at the village level¹ in the state of Tamil Nadu in the south-east of India, thereby contributing to the improvement of the local socio-economic situation.

This project is highly relevant, as it is consistent with priority areas in the development policy of India’s and Japan’s ODA policy, and also with development needs. The efficiency is high, as its cost and duration were within the plan. The afforestation was implemented mostly according to the plan, with a high survival rate of planted trees and forest regenerated. In addition, it is recognized that the annual income of the targeted villages has increased because of income gained from small scale business using micro credit implemented through this project at least for a certain period. Therefore, the effectiveness is high. The rise of the groundwater level has been confirmed by survival of planted trees and improvements of the soil conservation facilities, and the impact such as the diversification of the cropping items emerged. Residents’ awareness of forest protection and nature conservation also increased, forest fires decreased, and trees are being protected through appropriate management of livestock. Social fencing, which monitors illegal grazing and felling trees, has also been established. As such, the effectiveness and impact of the project are both judged as high. The operation and maintenance system of the executing agency is well established; there is no problem with technical capabilities and the project is mostly maintained. Although there are a few issues remaining with the financial sustainability of village forest councils, the sustainability of the effects emerged by this project is high.

In light of the above, the evaluation result of this project is highly satisfactory.

1. Project Description



Project Location



Workshop on Effect of Afforestation
Vellore District

¹ In this context, the “village” of village forest councils is often not the same as the administrative village. This refers to villages consisting of one or several settlements.

1.1 Background

The state of Tamil Nadu is located in south-east India facing the Indian Ocean, with an area of 130,000 km² and a total population of 72.13 million.² It is an industrial state that is representative of South India. The western part of the state is a mountainous area in the Western Ghats, while it has a wide plain spreading to the Bay of Bengal of the eastern part. The western mountainous area is warm year-round with an annual mean temperature of 20 to 24°C. Since the eastern plain is in the subtropical zone, it is hot year-round, with temperatures around 30°C. The annual mean precipitation of the state is 925 mm³ and it is affected by the Northeast Monsoon.

Tamil Nadu began the Tamil Nadu Afforestation Project in 1997, planting trees in 430,000 ha of scrub. However, cutting of fuel trees and grazing by free-range livestock put a burden on forests, and about 130,000 ha of the 270,000 ha remaining scrub that were not covered in Phase I, needed afforestation and regeneration of forest through Phase II by the ODA loan.

1.2 Project Outline

The objective of this project is to regenerate forests and improve the standard of living of local residents in the state of Tamil Nadu in the south-east of India by afforestation and livelihood improvement activities using a community participatory method at the village level, thereby contributing to the improvement of the local socio-economic situation.

Loan Approved Amount / Disbursed Amount	9,818 million yen / 9,199 million yen	
Exchange of Notes Date / Loan Agreement Signing Date	March 2005/ March 2005	
Terms and Conditions	Interest Rate	0.75%
	Repayment Period (Grace Period)	40 years (10 years)
	Conditions for Procurement	General Untied
Borrower/Executing Agency	The President of India/ State Government of Tamil Nadu, Forest Department	
Project Completion	March 2013	
Main Contractor	No	
Main Consultant	No	
Related Study	“Tamil Nadu Afforestation Project(Phase II)” State Government of Tamil Nadu, Forest Department (February 2001)	
Related Projects	Japanese ODA Loan Project “Tamil Nadu Afforestation Project” (1997)	

² 2011 census.

³ The annual mean precipitation from 2005 to 2015 (India Meteorological Department).

2. Outline of the Evaluation Study

2.1 External Evaluator

Noriyo Aoki (Alfapremia Co., Ltd.)

Miwa Hayashi (Alfapremia Co., Ltd)

2.2 Duration of Evaluation Study

This ex-post evaluation was conducted during the following schedule.

Duration of the Study: August 2017 - January 2019

Duration of Field Study: November 26 - December 8, 2017, April 8 - May 12, 2018

3. Results of the Evaluation (Overall Rating: A⁴)

3.1 Relevance (Rating: ③⁵)

3.1.1 Consistency with Development Policy of India

The government of India aimed to achieve 25% of forest and tree cover rate⁶ by the end of the *10th five-year plan (2002–2007)*, and 33% by the end of the *11th five-year plan (2007–2012)*. In the *10th five-year plan*, the focus was on the regeneration of scrub and sustainable forest management through the promotion of Joint Forest Management (herein after referred to as “JFM”).⁷ Support for alternative ways to earn a living for those dependent on forests was also proposed.⁸ The government of India announced the *National Forest Action Program (NFAP)* in 1999 as a comprehensive implementation plan to tackle issues identified by the *1988 National Forest Policy*. The NFAP addressed: 1) protection of existing forests, 2) strengthening restoration potentials of scrubs, 3) restriction on felling, 4) enhancement of policies and organizations, and 5) expansion of the area of forests.⁹ In *Tamil Nadu’s 10th five-year plan (2002–2007)*, scrub renewal was one of the highest priorities.¹⁰ Furthermore, the government of India promoted afforestation in areas outside of forest reserves and conservation areas to increase forest and tree cover rate in the *11th five-year plan (2007–2012)*.

In the ex-post evaluation, the government of India did not set a goal for forest or tree cover rate in the *12th five-year plan (2012–2017)*. However, it addressed enhancement of forest

⁴ A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

⁵ ③: High, ②: Fair, ①: Low

⁶ A set of tree crowns with the crown rate of 0.1 (10%) or higher and an area of 1 ha or larger is called a forest. Tree crowns refer to branches and leaves. When the crown rate is less than 0.1, the area is called scrub, which is not considered a forest. When the crown rate is 0.1 or higher but less than 0.4, it is called open forest. At the appraisal, a crown rate of 0.4 or higher was called dense forest, but at the time of the ex-post evaluation, classification of dense forest was subdivided, and a crown rate of 0.4 or higher but less than 0.7 was called moderately dense forest, while 0.7 or higher was called very dense forest. Forest cover is obtained by dividing the sum of open forest, moderately dense forest, and very dense forest by the geographic area. Crown rate is obtained by dividing the area of lush trees within 1 ha by the geographic area. Therefore, crown rate and forest cover rate are different. Forest and tree cover rate is calculated by combining the forest cover rate with a crown rate of less than 0.1.

⁷ A scheme that was implemented in the 1990s to conserve and regenerate forests by people participations, in which highly dependent on forests around the target area are encouraged to participate in forest projects to achieve both recovery of forests and improvement in livelihood of the poor. Residents create VFC, and with the support of the Forest Department and NGOs, afforestation of the target area and the forest management “microplan” are formulated. The Forest Department provides seedlings to VFC based on the same plan, and performs afforestation and conservation jointly.

⁸ Materials provided by JICA.

⁹ Materials provided by JICA. As a comprehensive implementation plan to tackle issues identified by the *1988 National Forest Policy*, the government of India launch the *National Forest Action Program (NFAP)* in 1999, but the 1988 National Forest Policy became the major sector policy again.

¹⁰ Materials provided by JICA.

management and greening through village forest council (herein after referred to as “VFC”) of JFM and enhancement of forest management at the state level.¹¹ The *11th five-year plan (2007–2012) of Tamil Nadu* addressed afforestation by the federal government and the state, including afforestation by this project, enhancing afforestation of areas outside of forests to preserve livelihood, and increasing forest cover rate. In the following *12th five-year plan (2012–2017)*, the aim was to restore scrub, promote afforestation outside of forest areas, and increase forest cover rate.¹²

In light of the above, this project is consistent with development policies of the governments of India and the state of Tamil Nadu both at the time of appraisal and ex-post evaluation.

3.1.2. Consistency with Development Needs of India

The forest cover rate in Tamil Nadu in 2001 before the start of this project was 16.5%, which was lower than the average forest cover rate in India (20.1%). Therefore, improving the quality of forest (decreasing areas of scrub and open forest) and expanding the area of forest became major issues.¹³

Many people, including the poor, depend on forests as means for livestock feed, fuel, and income, and the burden on forests was increasing with population growth. As a result, deterioration of the quality of forests and decline in soil and moisture conservation function became serious, and the underground water table dropped. This led to an insufficient agriculture water and drinking water, putting pressure on the livelihood of the poor. The vicious cycle, which caused using excessive forests exceeding allowable amount to maintain sustainable forest conservation, occurred. Therefore, with the expansion of the area of forests, improving the standard of living for people who were dependent on forests became an important issue.¹⁴

In Tamil Nadu, before the start of this project, forests had deteriorated and scrub requiring immediate measures had spread to about 700,000 ha.¹⁵

At the ex-post evaluation, forest cover rate in India had increased to 21.3% in 2015 from 20.6% in 2005.¹⁶ The forest cover rate in the state of Tamil Nadu was 17.7% in 2005, increased to 20.3% in 2015,¹⁷ which was below the national average in India, but did show an increasing trend.

Many people, including the poor, had depended on forests as their only means of acquiring livestock feed, fuel, and income. However, as will be discussed in the section on effectiveness and impact, dependence on forests has decreased, and other means to improve livelihood and diversification of cropping items became possible as a result of this project. In view of the above the recovery of forests, improvements in soil and moisture conservation function of forests, and a positive impact on the supply of agricultural and drinking water can be inferred.

Illegal forest felling mostly disappeared¹⁸, and the vicious cycle identified at the time of the

¹¹ Results of interview survey to the executing agency.

¹² Responses to the executing agency questionnaire.

¹³ Materials provided by JICA. *India State of Forest Report*.

¹⁴ Materials provided by JICA.

¹⁵ 1995 The Forest Department. Materials provided by JICA.

¹⁶ *India State of Forest Report*.

¹⁷ *India State of Forest Report*.

¹⁸ According to the interview survey in 24 villages, 22 villages including afforested areas and surrounding forests are answering that illegal logging has ceased.

appraisal as stated above was eliminated. Thus, not only did the forests expand in area but the amount of forests with a higher crown rate also increased. People who previously relied solely on forests for their livelihood were now less dependent on forests, at the same time the living standards improved.¹⁹

According to *India's State of Forest Report*, based on satellite data of India, in the case of targeted districts of Integrated Watershed Conservation Afforestation Program (hereinafter referred to as "IWDP") of this project, the area of scrub was 177,700 ha in 2005, which decreased by 136,800 ha to 40,900 ha in 2015. In contrast, the area of open forest was 9,404 ha in 2005 but increased by 1,941 to 11,345 ha in 2015. Area of dense forest was 1,076,900 ha in 2005, and increased by 87,000 ha to 1,163,900 ha in 2015.²⁰ Such achievements as the decrease in scrub and increase in the area of open and dense forests can not necessarily be said to be the result of this project given that seedlings planted during this project had different growth rates depending on tree species, that young seedlings had few branches, and the growth in the "Tamil Nadu Afforestation Project" started in 1997, (hereafter it is referred to as "Phase I") trees became visible. Still, this information does indicate that the forests of the state of Tamil Nadu are in good regeneration status.

The Phase I, and this project (Phase II) targeted different VFC. "Tamil Nadu Biodiversity Conservation and Greening Project (herein after referred to as TBGP)," which began in 2011, is different from both Phase I and Phase II which focused on planting in state properties, and TBGP promotes afforestation in private property. Each phase has different duties and roles.

In light of the above, the development needs that were urgent at the time of appraisal were fulfilled at the time of the ex-post evaluation. Both the prioritization of this project and selection of the target area are considered to be highly relevant.

3.1.3 Consistency with Japan's ODA Policy

In the *Medium-Term Strategy for Overseas Economic Cooperation Operations (2002)* out of the priority areas of support for India, this project was designed to contribute to "regional development to benefit the poor" and "environmental improvement."²¹ In the *Country Assistance Strategy for India (2004)*, the forestry sector is positioned as a major sector to support India. Besides improving the amount and quality of forests through expansion of forest area and reduction of open forest rate, the project promotes sustainable supply of forest products to the poor who are highly dependent on forest resources and earn income without relying on forests by supporting the acquisition of alternative income measures, which contributes not only to preserving the natural environment and water resources but also to making the lives of local residents stable and improved. The urgency and importance of this project are considered high from the viewpoint of poverty alleviation.²²

¹⁹ Responses by the executing agency and field survey results.

²⁰ *India State of Forest Report* and responses from the executing agency.

²¹ Materials provided by JICA.

²² Materials provided by JICA.

3.1.4 Appropriateness of Project Plan and Approach

This project was a community participatory afforestation plan that catered to the afforestation situation of the state of Tamil Nadu, and afforestation was implemented in accordance with village development activities and livelihood improvement activities at the initial introductory stage. As a result, forests were regenerated, and the residents' standard of living and poverty conditions improved. Therefore, as the solution measures against the issues, this project plan and its approach can be considered relevant.

3.2 Efficiency (Rating: ③)

3.2.1 Project Outputs

Some of the project outputs exceeded the planned values, since afforestation was performed by the state government funds within the overall project cost, but the other outputs mostly met the planned values. The plan and actual are described in the section "Comparison of the Original and Actual Scope of the Project" at the end of this report.

3.2.1.1 Afforestation Program

There are two types of afforestation programs, the Integrated Watershed Development Program (IWDP) and the Integrated Tribal Development Program (ITDP), and both were implemented.

IWDP is divided into an upper zone and a lower zone, where the upper zone refers to an area within a small watershed with a steep gradient, and 100 ha of afforestation was implemented for each VFC. In the lower zone, having a gentle slope adjacent to villages, 150 ha of afforestation was implemented for each VFC. Planted items under IWDP included native species that are in high demand for daily needs, such as fuel wood, fruits, and materials for crafting.

On the other hand, ITDP is not divided into upper and lower zones, and 100 ha of afforestation was undertaken for each VFC. The afforestation tasks, such as planting seedlings and initial watering, were performed by residents of VFC. Residents also provided labor for soil and moisture conservation construction related with afforestation, such as creating infiltration trenches, check dams, and percolation pond.

Table 1 Comparison of Plan and Actual Related with Outputs ^{Note 1)}

Items	Plan	Actual
IWDP		
Afforestation Area	162,500 ha	189,250 ha
(Scrub Area Within)	125,000 ha	147,250 ha
Number of Implemented Villages	650 villages in 23 districts	757 villages in 25 districts ^{Note 2)}
ITDP		
Afforestation Area	15,000 ha	19,300 ha
Number of Implemented Villages	150 villages in 13 districts	193 villages in 16 districts ^{Note 2)}
Farm Forestry²³⁾		
Seedlings	N/A	1,025,000
Grafts	N/A	69,000
Labor by Residents (Planting Seedlings, Soil and Moisture Conservation Work)	16,591,000	20,440,000
Soil and Moisture Conservation		
Check Dams	4,152 facilities	5,271 facilities
Percolation Pond	1,177 facilities	2,026 facilities

Source: Responses to the executing agency questionnaire.

Note 1) Since the additional afforestation budget was allotted by the executing agency within the total project cost, the actual area of afforestation and the number of villages were larger than that originally planned. Due to fluctuations in the exchange rate during the project implementation period, additional afforestation became possible.

Note 2) Increasing number of the districts is due to a separation of some districts implemented for administrative strengthening.

3.2.1.2 VFC Formation

Guidelines for VFC (*Guidelines for Implementation of Joint Forest Management in Tamil Nadu*) were revised in 2005 and new VFCs were formed based on this guideline. VFC is an organization newly established by the Tamil Nadu Society Act (1975).²⁴ For VFC formation and microplan preparation, 480 NGOs held participatory orientations at target villages.

Requirements for VFC establishment are different between IWDP and ITDP. VFC selection requirements for IWDP mandate that the village is within 5 km of scrub, there exists vicious cycle (damage to forest due to felling, leading to decline in the standard of living, and further felling), one female and one male from each household participate as members, and the total number of participants be 60% or more of the village population. VFC selection requirements of ITDP are that 80% or more of the population of the target village is part of the Schedule Tribe (herein after referred to as ST), and that the target village is 5 km or more from the closest city.

Table 2 Comparison of Plan and Actual Related with VFC Formation ^{Note 1)}

Classification	Plan	Actual
IWDP		
Number of VFC	650	757
ITDP		
Number of VFC	150	193
Total	800	950

Source: Responses to the executing agency questionnaire.

Note 1) Since the afforestation budget was allotted by the executing agency within the total project cost, the actual number of VFC were larger than that in the originally planned.

²³ The Forest Department grew seedlings and sold them to farmers. The cost of these seedlings farmers bear was determined to be 50% through discussion with the JICA India office and the Forest Department at the start of the project. Responses to the executing agency questionnaire.

²⁴ Responses to the executing agency questionnaire.

3.2.1.3 Livelihood Improvement Activities

In this project, to reduce the burden on forests by local residents who belong to the poor, the project developed infrastructure and implemented activities to improve income in the target villages. The project refers to these livelihood improvement activities as Buffer Zone Activity.

1) Community Development Works

Community Development Works were implemented by both IWDP and ITDP villages. Facilities that are important for villages, such as water tanks, community facilities, VFC offices, threshing floors, roads, toilets, and food distribution centers, were constructed. These were entry activities conducted before starting the afforestation.²⁵ The works were implemented in corporation with other departments,²⁶ and the number of village infrastructure development facilities constructed was 4,393.²⁷

2) Income Generation Activity

A Guidebook on Income Generating Activities (2005) was formulated, and activities were implemented accordingly. For each targeted VFC of IWDP villages, 1,075,000 rupees on average was granted through the authorization by the Forest Department, and for each targeted VFC of ITDP villages, 700,000 rupees on average was granted. From these funds, 10,000 rupees per head was given to individuals or members of Self-Help Group (hereinafter referred to as “SHG”) as loans. Interviews revealed that the interest on the loan for SHG was 12%.²⁸ The number of micro credit recipients comprised 41,688 males and 117,553 females, a total of 159,241.²⁹ The interest repayment of this micro credit was collected by VFC and became a revolving fund.

3) Establishment of SHG

SHG was established in accordance with the SHG guidelines proposed by Tamil Nadu Corporation for the Development of Women.³⁰ One SHG organization consists of 15 to 20 members. The requirements for membership included being a member of VFC, being part of a household living below the poverty line, and having an annual income of 12,000 rupees or less. Basically, the target group included residents 18 to 60 years of age. SHG members share a similar economic status, especially women, forest dependents, ST, Scheduled Caste (hereinafter referred to as “SC”), people without a spouse who is able to earn income, and landless farmers, but if the above conditions are met, males can be members as well. According to the final evaluation performed by the executing agency,³¹ SHG members were 75% female and 25% male.

²⁵ These activities were performed to build relationships between residents of target VFC and government departments. As confirmed by the Forest Department Headquarters, the budget of construction etc. was handed over from the Forest Department to other administrative bureaus, but since the responsible office was the department in charge of each facility, it was supposed not to report the repair situation and so on. If anything is needed for repair, the chairperson of VFC is to issue a letter directly to the administrative bureau or department in charge, and request repair. According to the request, repair costs are to be secured by each administration bureau or department in charge.

²⁶ Twenty-four departments, such as the Ministry of Rural Development, Department of Agriculture, Ministry of Social Justice and Empowerment, and Department of Animal Husbandry, Dairying & Fisheries, cooperated.

²⁷ Materials provided by JICA.

²⁸ Measures and penalties for failure to repay loans were to be determined by each group.

²⁹ Materials provided by JICA. The information on attributes of micro credit recipients such as caste and social class, or the amount of loans from VFC to SHG were unable to obtain.

³⁰ *Handbook for Self-Help Groups by Tamil Nadu Corporation for Development of Women, 2003.*

³¹ *Terminal Evaluation Study of the Tamil Nadu Afforestation Project (TAP)-Phase II, 2015*

Table 3 Comparison of Plan and Actual Related with the Formation of SHG ^{Note 1)}

	Plan	Actual
Number of SHG Established	1,600	3,283

Source: Responses to the executing agency questionnaire. Materials provided by JICA.

Note 1) This includes newly established SHG and existing SHG that began to receive loans with permission from VFC and the Forest Department. The number of newly established SHG and other SHG were unable to be confirmed.

3.2.1.4 Strengthening of Forest Management Capacity

1) Construction of the Forestry Extension Center

There are 11 facilities constructed by this project as the Forestry Extension Center.³² There was one facility constructed in each of the 11 districts. If Forestry Extension Centers constructed in Phase I are included, there is one facility in every district of Tamil Nadu.³³ After the start of this project, in 2005, 2006, and 2007, six facilities, four facilities, and one facility were constructed, respectively. They were established in the early stage after the start of this project. The Forestry Extension Centers were used for training of farmers and VFC.

2) Training

Since the training was prioritized by the project, not only forest management field staff, but VFC representatives and members, SHG members, and NGO staff all received training.³⁴ The total number of trained participants through this project was 83,875 staff from the Forest Department who instructed VFC were trained at the Tamil Nadu Forest Academy, the National Institute of Rural Development, the Indian Institute of Forest Management, and nearby Forestry Extension Centers. The contents of training included the objectives and activities in framework of JFM, afforestation technical guidance, promotion of female participation, micro credit and business, dealing with forest fires, and soil and moisture conservation.³⁵

Table 4 Actually Trained Stakeholders (unit: number of person)

	Actual
Senior Staff of the Forest Department, Forest Officer	737
Field Staff of the Forest Department, Forest Subordinate Service ^{Note 1)}	9,891
Office Staff of the Forest Department, Forest Ministerial Service ^{Note 2)}	875
NGO	515
VFC	2,629
SHG	11,017
Farmers	37,037
Other (Village Administrative Staff, etc.)	21,174
Total	83,875

Source: Responses to the executing agency questionnaire.

Note 1) Forest staff in the field, rangers, forester, and watcher.

Note 2) Office administrative staff.

3) Expanded Use of Geographical Information System (GIS)

To process and analyze topographic and administrative area data, and to create a database and websites, GIS software was installed at the Forest Department Headquarters. The software was provided to 15 forest circle offices³⁶ so they could access the Headquarters' database in real time. Also, 329 GPS devices were introduced for field staff to survey the area of forests and afforestation planned areas. To foster staff necessary to build GIS, trainings were held both in India and overseas. Instructions on how to use GIS during Phase I were provided during the

³² Materials provided by JICA.

³³ Materials provided by JICA. This means it was constructed in all districts at the time of appraisal.

³⁴ Materials provided by Implementing Agency.

³⁵ Responses to the executing agency questionnaire.

³⁶ A higher supervising office that supervises 3-4 districts.

trainings in India. Sessions of these trainings operated mostly according to the plan at the time of appraisal.

3.2.2 Project Inputs

3.2.2.1 Project Cost

The total project cost planned was 13,618 million yen, and the Japanese ODA loan was 9,818 million yen. The executing agency was responsible for 3,800 million yen. The actual total project expense was 13,198 million yen, but it was impossible to obtain separate information for foreign and local currencies. The actual total amount of the Japanese ODA loan was 9,129 million yen;³⁷ which was 93% of the planned Japanese ODA loan of 9,818 million yen. The total project cost was planned to be 13,618 million yen, and the actual was 13,198 million yen (97%), which was within the plan.

Comparison of the breakdown of the plan and actual shows that those portions of the ODA loan stipulated for livelihood improvement activities, physical contingency, and interest were unused. In addition, fluctuations in currency exchange practically reduced the cost.

The allocation by the executing agency was 3,800 million yen at the time of appraisal, but it came to 4,069 million yen (107%). For afforestation activities, 55 million yen was newly allocated. Therefore, more afforestation and supplementary planting were performed than planned. The 5 million yen surplus was spent on income improvement activities.

Table 5 Comparison of Plan and Actual Related with Project Expenses (unit: million yen)

Items	Plan		Actual	
	ODA Loan	Paid by the Executing Agency Note 1)	ODA Loan	Paid by the Executing Agency Note 2)
Afforestation	4,975	0	5,270	55
Livelihood Improvement Activities	1,929	0	1,871	5
Strengthening Forest Management Capacity	1,543	0	1,641	143
Price Escalation	517	0	0	0
Physical Contingency	448	0	0	0
Tax	0	4	0	0
General Management	0	3,796	0	3,866
Interest Rate during Construction	406	0	347	0
Total	9,818	3,800	9,129	4,069
Total Project Budget	13,618		13,198	

Source: Materials provided by JICA. Responses from the executing agency.

Note 1) Currency exchange rate: US\$ 1 = 109 yen, local currency 1 rupee = 2.40 yen. Rate of price escalation: foreign currency 1.4%/year, and local currency 1.8%/year. Physical contingency rate: 5.0%. Cost estimation period: August 2004.

Note 2) Currency exchange rate: (actual) US\$ 1 = 100.1 yen (March 2005 to March 2013 average exchange rate), local currency 1 rupee = 2.15 yen (March 2005 to March 2013 average exchange rate).

³⁷ Responses to the executing agency questionnaire. Document(s) provided by JICA.

3.2.2.2 Project Period

The project duration was 97 months, from March 2005 (L/A signing) to March 2013 as planned. The definition of completion was not described in the official documents. However, based on the materials provided by JICA and the testimonies of related stakeholders, the definition of completion was assumed to be the completion of the activities of afforestation, seedling planting and plantation maintenance activities, livelihood improvement activities, and strengthening forest management capacity.

Table 6 Comparison of Plan and Actual with Project Duration

	Plan	Duration (months) ^{Note 1)}	Actual	Duration (months) ^{Note 1)}
■ Afforestation				
Tree Planting	2005/4 - 2010/3	60	2005/4 - 2009/3	48
Supplementary Planting	2006/3 - 2013/3	85	2006/4 - 2013/3	84
■ Livelihood Improvement Activities	2005/4 - 2013/4	97	2005/4 - 2013/3	96
■ Strengthening of Forest Management Capacity				
Monitoring and Evaluation	2005/4 - 2013/2	95	2005/4 - 2013/3	96
Training	2005/3 - 2009/3	49	2005/4 - 2009/3	48
Expansion of the GIS System	2005/4 - 2010/3	60	2005/4 - 2013/3	96

Source: Materials provided by JICA. Responses from the executing.
Note 1) Rounded.

3.2.3 Results of Calculations Internal Rate of Return (Reference Only)

Financial internal rate of return and economic internal rate of return of the afforestation project were calculated by external experts at the time of the appraisal, and calculated items, such as profit, were in accordance with calculation methods at the time of appraisal. As for environmental impacts, the figures were calculated following the estimation items used by external experts.

Table 7 Internal Rate of Return of Project

	Financial Internal Rate of Return (FIRR)	Economic Internal Rate of Return (EIRR)
At Appraisal	1.3%	11.6%
At Ex-Post Evaluation	1.1%	11.9%
Cost	Afforestation and soil conservation, forest management, improvement of the Forest Department infrastructure, extension and training, maintenance management cost	Afforestation and soil conservation, forest management, improvement of the Forest Department infrastructure, extension and training, maintenance management cost
Benefits	Sales income from forest products	Increase in forest products, water source protection, agricultural profits, environmental impacts
Project Life	30 years	30 years

Source: Materials provided by JICA. Responses from the executing agency.
Note) At planning, the project cost is calculated without accounting for any increase in prices; thus, the present calculation does not include such increases either.

The financial internal rate of return was 1.1% since the profit allocation ratio of the Forest Department and VFC keeps profits small. The economic internal rate of return shows an increase in the project expenses compared to the time of appraisal since it was calculated in the local

currency, and the total maintenance management required also increased. As profits, agricultural profits are expected through water source conservation and soil and moisture conservation, leading to an economic internal rate of return of 11.9%.

As the described above, the project cost and duration remained within the plan limits. The efficiency is high.

3.3 Effectiveness and Impacts (Rating:③)

3.3.1 Quantitative Effects (Operation and Effect Indicators)

3.3.1.1 Afforestation Area, Number of Seedlings Planted, and Survival Rate (Operation Indicators)

As seen in Table 8, the afforestation area and the number of seedlings planted in the project mostly met the goal as shown by the indicators.

Table 8 Comparison of the Afforestation Plan and Actual for Target Villages

Indicator Name	Target (2015)	Actual (2015)	Level of Achievement
	2 years after project completion	2 years after project completion	
Afforestation Area (ha)	177,500	208,550 ^{Note 1)}	118 %
Seedlings Planted (No.)	34,150,825	39,991,825	117 %
Seedlings Planted in Supplementary Planting (No.)	6,550,000	9,808,682 ^{Note 2)}	150 %

Source: Ex-ante evaluation sheet, materials provided report, and responses to the executing agency questionnaire.

Note 1) The target was exceeded because of funds from the executing agency allowing for 31,050 ha of afforestation.

Note 2) The number of seedlings that died or were damaged within two years of afforestation were replaced. The number of seedlings planted in supplementary planting with the funding by the executing agency was 2,356,806.

The survival rate of planted trees is an important indicator that confirms the effectiveness of afforestation, but such an indicator was not set at the time of the appraisal. In the ex-post evaluation, we use it as one of the alternative indicators to confirm effectiveness. It was 70% in 2015, meaning growing conditions after afforestation has been favorable.

Table 9 Actual Survival Rate of Planted Trees in Target Villages ^{Note 1)} (Alternative Indicator)

Program Name	2015 (Actual)
	2 years after project completion
IWDP	69 %
ITDP	71 %

Source: Responses to the executing agency questionnaire.

Note 1) Trees planted as part of supplementary afforestation are counted in the survival rate. The five-year survival rate of planted trees was determined to be an important indicator from an expert viewpoint by the executing agency. Since afforestation began in April 2005 and ended in March 2009, the survival rate in 2015 was obtained through the executing agency.

3.3.1.2 Changes in Forest Cover Rate and Crown Density in Target Districts (Reference Indicator)

At the time of appraisal, it was assumed that the change in crown density of the afforestation target area would be examined as follows.

Table 10 Target Values Related with Crown Density (At Appraisal)

Indicator	Target Value(2019)
	6 years after completion of project
Crown Density	Scrub (less than 0.1) →Open forest (0.1 or over 0.1 -less than 0.4)
	Open forest →Dense forest (less than 0.4)
	Dense forest → Dense forest with higher crown density ^{note1)}

Source: Ex-ante Evaluation Sheet of the project. Materials provided by JICA

Note1) Describe the description of the materials provided by JICA at appraisal as it is.

Target values related with crown density were set as per Table 10 according to the Ex-ante Evaluation Sheet and the plan at the time of appraisal. However, the changes in crown density of the target afforestation area or surrounding forests could not be obtained even by satellite data.

The evaluator used two indicators such as “forest cover rate in IWDP target districts” and “changes in the area by crown density in IWDP target districts” only as reference indicators for evaluation and did not consider them in sub-rating judgement. The reason for that is as follows. For example, Table 11 shows the forest cover rate of IWDP target districts which was cited from the *India State of Forest Report*. However, it is calculated from satellite data in which the factors such as loss of forests due to urbanization and the 2004 Indian Ocean Tsunami, commercial plantation not related with this project, the agricultural crops that appear as forests from the satellite, and decrease in the burden on forests owing to LPG distribution are not comprehensively investigated and adjusted in the data.

Table 11 Forest Cover Rate in IWDP Target Districts³⁸ (Reference Indicator)

Indicator	Plan (2005)	Actual (2015)
	At start	2 years after completion of project
Forest Cover Rate	18.3%	22.9%

Source: *India State of Forest Report*

Table 12 also shows changes in crown density in IWDP target districts. The data shows scrub decreased, and open and dense forests increased in IWDP target districts at the time of 2015. However it is not possible to measure the effects on afforested plantations only by this project. Therefore, the changes in crown density is regarded as a reference indicator and is not used for the evaluation.

Table 12 Changes in Area by Crown Density in IWDP Target Districts ^{Note 1)} (Reference Indicator)

Indicator		Plan (2005)	Actual (2015)	Change in Area, %
		At start	2 years after completion of project	
Classification by Crown Cover	Scrub	177,700 ha	40,900 ha	1.6 % ⇒ 0.4 %
	Open Forest	9,404 ha	11,345 ha	0.08 % ⇒ 0.10 %
	Dense Forest ^{Note 2)}	1,076,900 ha	1,163,900 ha	9.8 % ⇒ 10.6 %

Source: *India State of Forest Report*

Note 1) IWDP target district area: 11,016,000 km² = 111,016,000 ha. This is the area of IWDP target districts at the time of the plan. Administratively, districts are divided into two, increasing the numbers. These new districts are included in the count.

Note 2) Dense forest referred to the crown rate of ≥0.4 at the time of the appraisal but by the ex-post evaluation, dense forests were sub-divided. According to crown rate, ≥0.4 to <0.7 is called Moderately Dense Forest, and ≥0.7% is called Very Dense Forest. In this report the evaluator refer to both classifications of dense forests.

³⁸ At the ex-post evaluation, 25 out of 30 districts in the state were IWDP target districts.

Though it is a reference indicator which is not reflexed in the evaluation, when comparing the change in the ratio of forest in IWDP target districts, scrub would not be included as forests based on the definition of forests; thus, if comparing the overall area of forests, the evaluator compared the changes by combining open forest with dense forest. Changes in forest areas are shown in Table 13.

Table 13 Changes in Forest Area in IWDP Target Districts (Reference Indicator)

Indicator		Plan (2005)	Actual (2015)	Change in Area, %
		At start	2 years after completion of project	
Forest Area	Open Forest	9,404 ha	11,345 ha	0.08 % ⇒ 0.10 %
	Dense Forest	1,076,900 ha	1,163,900 ha	9.8 % ⇒ 10.6 %
Total		1,086,304 ha	1,175,245 ha	9.9% ⇒ 10.7%

Source: India State of Forest Report

3.3.1.3 Improved Effects on the Standard of Living

Improved effects on the standard of living of residents in target VFC by the project were qualitatively confirmed, as will be discussed later. It was difficult to quantitatively measure the improvements since it is impossible to identify what kind of factors contributed the improvement of standard of living. It is not clear whether or not they are these improvements brought by this project, income improvement due to increase of regional gross production due to economic growth, or income increase from household member's employment in neighboring cities. The goal set at the time of the appraisal was a 10% increase in household income for farmers in target villages,³⁹ but according to Table 14, though there was a change immediately after the start of the project in the annual income in 2015, it was assumed that the 10% increase in household income of farmers of the target villages was achieved, and according to interviews conducted with the concerned parties, improving effects on livelihood through introduction of infrastructure in this project have been confirmed.

Table 14 Changes in Annual Income Right after Start of Project (Reference Indicator)

Program	Target Surveyed Villages	Annual Income Baseline (2005) (unit: rupees)	Annual Income (2015) (unit: rupees)	Rate of Increase (%)
IWDP (less than 0.4) ^{note)}	35	12,649	19,076	51
IWDP (0.4 or over 0.4– less than 0.6)	30	11,899	17,258	45
ITDP	15	13,138	17,156	31

Source: Terminal Evaluation Study of the Tamil Nadu Afforestation Project (TAP)-Phase II, 2015

Note: () indicates crown density

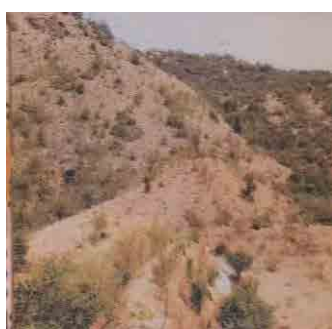
³⁹ We will discuss issues related to setting the indicators of the standard of living in the “Lessons Learned” section.

3.3.2 Qualitative Effects

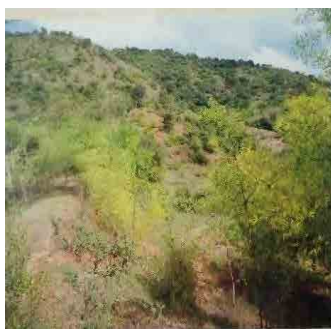
3.3.2.1 Forest Regeneration

The field survey mainly visited sites where afforestation in the scrub area was conducted and forest regeneration was taking place., which was also verified by satellite data.⁴⁰ Therefore, the survey sites are not necessarily the representative VFC villages of this project.

In IWDP with small basins, residents of VFC managed livestock appropriately to protect forests,⁴¹ and protected seedlings by prohibiting access to afforestation areas several months after planting in order to promote regeneration of the afforestation areas. When residents discovered forest fires and illegal felling, they were instructed to report this to the Forest Department. As shown in Table 15, LPG was distributed by the state government policies after 2012, which reduced felling of fuel materials and accelerated forest regeneration in the scrub area.



Pudur VFC, Vellore District
Plantation Area, November 2006
(Photograph from a microplan)



Pudur VFC, Vellore District
Plantation Area, November 2012
(Photo provided by the range office)



Pudur VFC, Vellore District
Field Survey, November 2017
(Photo by the evaluator)

Table 15 Fuel for Cooking (unit:%)

Kind of Fuel	2007/08		2012/13	
	Rural	Urban	Rural	Urban
LPG	14.9	53.2	37.7	72.5
Electricity	0.1	0.1	0.3	0.4
Kerosene	1.7	8.0	1.5	2.8
Wood	81.6	36.1	56.6	14.9
Other	1.7	2.6	3.9	9.4
Total	100	100	100	100

Source: *Tamil Nadu District Level Household and Facility Survey 2007-08 & 2012-13*
(Ministry of Health & Family Welfare, Govt. of India) ⁴²

⁴⁰ The four VFC villages in the Vellore and Tiruvannamalai districts were visited.

⁴¹ The activities include making fodder and leashing cattle to protect forests, and limiting the grazing areas for goats and sheep.

⁴² In addition, National Family Health Survey (NFHS-3) India 2005-06: Tamil Nadu; Ministry of Health and Family Welfare, Government of India statistically analyzed fuel materials, but statistical analysis of the household survey at the district level is more consistent with field survey results; thus, the table was prepared on the basis of the household survey at the district level. The latest household survey results at the district level in Tamil Nadu have not yet been published.

3.3.2.2 Improvement in the Standard of Living

In terms of effects of small scale income generation activities by micro credit from VFC to SHG, specific examples of activities and their effects have been reported in the mid-term and final reports prepared by the executing agency. Diverse activities conducted through the use of micro credit included dairy businesses, small scale sale of goods, breeding of goats, management of small shops, leasing of tamarind trees, machine sewing, breeding of sheep, chai shops, load carriage by ox car, sale of Palmyra palm leaves, and sale of fruits, coconuts and so on.⁴³ As shown in the change of annual income right after the start of the project (Table 14), a certain degree of contribution is recognized to the improvement of household income.

According to results of the interviews conducted in Pudur village and Oorgoundanur village in Vellore district, sources of household income were mushroom cultivation, candle making, incense making, compost making, poultry farming and so on. According to micro credit records of each target village, the debt repayment rate was good for two to three years after the start of the loans, and they were confirmed to be a source of household income. However, subsequent continuous profitability was different depending on fund management by each VFC group.⁴⁴ Even in the field survey, the degree of effect that small income generation activities by micro credit had on household income could not be specifically and numerically clarified.

Field surveys conducted in four villages in the Vellore and Tiruvannamalai districts showed that most of the households below the poverty line (BPL) in target villages climbed above the poverty line (APL), but since the state government is supplying products related with household goods and food, and promoting policies on subsidies to raise the standard of living for the poorest, the degree to which this project had an effect on improvement of the standard of living could not be confirmed.

As such, though there are diverse factors contributing to improving the standard of living, it is recognized that impact surveys and field surveys confirmed that annual income of target villages did increase from profits of small scale businesses by micro credit for a certain period. Since the effect of this project on the standard of living exceeds the target value, its effect is judged mostly high.

The planned afforestation was mostly achieved with a good survival rate of planted trees, and forest regeneration was mostly promoted by this project. As for the improvement of standard living, though there exist other factors, in most cases it was limited to a certain period of time, there was an increase in the annual income of target villages due to profits of small scale businesses through micro credit; thus, the effectiveness of this project is high.

3.4 Impacts

3.4.1 Intended Impacts



3.4.1.1 Rise in Ground Water Table and Soil Conservation

The Forest Department surveyed the benchmark water table at the start of this project and

⁴³ *Socio Economic Studies, Final Report – TAP Phase II, 2011.*

⁴⁴ Results of detailed village surveys conducted in the districts of Vellore and Tiruvannamalai.

measured the water table of wells in villages every month until the end of the project. According to the shallow well water table report published in 2011,⁴⁵ among 27 villages sampled by climate zones, 24 villages saw an increase in the water table of 1 to 4 meters. The field survey also confirmed that the water table increased by 4.6 m compared to levels at the start of the project.⁴⁶ According to interviews with VFC members conducted during the field survey, in these villages, an increased water table allowed the use of shallow wells that were formerly dry. It was confirmed, as a result, the farmers could start using irrigation for agriculture, and that paddy field and upland field increased.⁴⁷

		
<p>Rise in Water Table Level of Shallow Well, Vellore District</p>	<p>Check Dam, Vellore District</p>	<p>Leashed Cattle Tiruvannamalai District</p>

In this project, the pH and soil carbon contained amount were measured before starting of afforestation, but these values were not measured after completion of the project; thus, specific changes in soil could not be compared. According to the field staff of the Forest Department, improvements in water and soil conservation facilities and survival of planted trees suppressed the nutrient outflow of the soil, and preventing soil erosion during rainy seasons.

3.4.1.2 Increased Awareness of Forest Conservation among VFC Residents

Residents contributed to improvement of their natural environment through afforestation and forest conservation activities and received practical benefits like an increased standard of living. This led to residents playing a role in social fencing, in which they monitor illegal grazing, felling, and poaching, through VFC activities.⁴⁸

3.4.1.3 Decreased Number of Forest Fire Incidences

VFC members and neighborhood residents began to employ agricultural methods that prevent fires, and they began to immediately report fires to staff of the Forest Department when they spotted them. This led to a reduction in damages from forest fires.⁴⁹ The Forest Department reported that the number of forest fire cases decreased, as shown in Table 16, demonstrating that this project increased the awareness of forest and nature conservation in

⁴⁵ *Water Table Status Study Report, 2011*, Geofiny Technologies Private Limited. Please see Appendix 1 for details.

⁴⁶ Pudur village in Vellore district.

⁴⁷ Results of interviews with VFC members conducted as part of the field survey. Besides, the cases of a remarkable rise in the groundwater level were frequently observed in the cases of IWDP, and a rise in the groundwater level in more than 80% of villages in the lower agricultural land was determined by measurement. (The second field detailed survey results)

⁴⁸ Results of the interview conducted with the Vellore District Forest Department staff.

⁴⁹ Results of interview conducted with the Vellore District Forest Department staff.

residents.

Table 16 Number of Forest Fire Incidences

Category	Number of Cases (2005)	Number of Cases (2015)
	At start	2 years after completion
IWDP Districts	384	157
ITDP Districts	366	137

Source: Responses to the executing agency questionnaire.

3.4.1.4 Impact on Agriculture / Diversification of Income Acquisition Measures

Surveys conducted in Velleri and Oorgoundanur villages in Vellore district showed that micro credit and revolving funds allowed villages, where much previous income came from cultivation of rice, peanuts, and millet, to begin planting coconuts, cotton, sugar palm, bananas, papayas, flowers, capsicum, beans, and medicinal plants. The number of items planted increased both during the rainy and dry seasons. According to the survey of water tables, usable agricultural water increased due to a rise of water tables; thus, seven out of 27 villages cultivating rice changed from single to double crops.⁵⁰ Since irrigation possibilities create more agricultural land, the price of this land increased by two to five times in some VFC villages.

3.4.1.5 Impact on Wildlife

According to the interview survey conducted with VFC members and range office staff of Velleri village in Vellore district, animals and birds become commonly observed in watersheds within afforestation zones as compared to before the project. The wild boars, porcupines, peacocks,⁵¹ and jungle fowl⁵² inhabit the watersheds, while slender loris and hare inhabit the forests. According to staff of the Forest Department, although conflicts between humans and wildlife still remain where killing of animals is prohibited in India, there is a positive impact on animal protection.

3.4.1.6 Changes in Social-economic Activities due to Women's Participation in VFC and SHG

According to the interview survey with female VFC members of Darbadpalayam Village in Chengam sub-district of Tiruvannamalai district, women previously never left their homes without permission from their husbands. However, since this project required that one male and one female from each household participated in VFC, participation of women in training to improve livelihood and opportunities to visit towns through SHG activities increased.

There were also reports that women became more active in economic activities such as income improvement and participation in decision-making⁵³.

In addition, with the improvement of the economic situation in households, it was confirmed by interview survey in the visited VFC villages that the nutritional situation improved⁵⁴.

3.4.2 Other Positive and Negative Impacts

3.4.2.1 Impacts on Natural Environment

1) Impact on Environment

In view of sector characteristics, project characteristics, and regional characteristics stipulated in “*JBIC Guidelines for Confirmation of Environmental and Social Considerations*” (April 2002), the undesirable influences on the environment are judged not to be serious.

⁵⁰ *Water Table Status Study Report, 2011*, Geofiny Technologies Private Limited.

⁵¹ The peacock is the national bird of India.

⁵² These animals are designated as protected animals by the Wildlife Protection Act (1972).

⁵³ Survey results through group interviews conducted with SHG members who belong to VFC.

⁵⁴ Interview results in Pudur village and Oorgoundanur village in Vellore district.

2) Environmental Permits:

This project was not obliged to prepare an environmental impact assessment report based on the Indian domestic law, and no environmental license was required. Since indigenous species were selected for afforestation, it is assumed that there was no additional burden on the natural environment.⁵⁵

3.4.2.2 Resettlement and Land Acquisition

There was no resident relocation or land acquisition through this project.⁵⁶

To evaluate effectiveness and impacts of this project, we weighted among evaluation items such as operation indicators, effective indicators, and impacts by 40%, 40%, and 20%, respectively. Among operation indicator, effect indicator, and impact, indicators that are judged as especially important were attempted to judge evaluations by putting higher weight within each evaluation item.

Table 17 Attempt to Determine Effectiveness and Impacts

Evaluation Items (weight portion)	Indicator Name (items set at the time of appraisal)	Achievement Rate %	Weight within Each Evaluation Item	Results ^{Note 1)}	Evaluation Points	Evaluation Points×Weight portion
Operation Indicators (40%)	Afforestation area	118	0.2	3	0.6	
	Number of trees planted	97	0.2	3	0.6	
	The amount of supplementary planting	150	0.2	3	0.6	
	Survival rate of planted trees	Good	0.2	3	0.6	
	Number of VFC (SHG) established ^{Note2)}	116	0.1	3	0.3	
	Number of jobs created	123	0.1	3	0.3	
Evaluation Point in Total					3.0	1.20 ^{Note 3)}
Effect Indicators (40%)	Forest regeneration in the afforestation target area	N.A.	0.5	2 ^{Note6)}	1.0	
	Income per household of farm forestry as target beneficiary (reference indicator)	Achieved in most households	0.5	3	1.5	
Evaluation Point in Total					2.5	1.00 ^{Note 4)}
Impacts (20%)	Water table and soil conservation	Effective	0.2	2	0.4	
	Increased awareness of forest conservation (social fencing)	Effective	0.2	3	0.6	
	Impact on agriculture	Effective	0.1	2	0.2	
	Reduced number of forest fires	Effective	0.1	3	0.2	
	Impact on wildlife	Effective	0.1	3	0.3	
	Diversification of livelihood measures	Effective	0.1	3	0.3	
	Improvement of nutritional standard	Effective	0.1	3	0.3	
	Promotion of women's social participation	Effective	0.1	3	0.3	
Evaluation Total					2.6	0.52 ^{Note 5)}
Comprehensive Evaluation					2.6	2.72

Note 1) The criteria was set as follows: “③high: 80% or more of the plan (2.4), ②moderate: 50% or more but less than 80% of the plan (1.5 or higher but less than 2.4), and ①low: less than 50% of the plan (less than 1.5).”

Note 2) Since we were unable to grasp the number of newly established SHG, we measured the achievement rate of VFC.

Note 3) 3.0×0.4 (weight among evaluation items of operation indicators).

Note 4) 3.0×0.4 (weight among evaluation items of effect indicators).

Note 5) 2.4×0.2 (weight among evaluation items of impacts).

As a result of the evaluation of this comprehensive viewpoint, the effectiveness / impact of

⁵⁵ Responses to the executing agency questionnaire.

⁵⁶ Results of the interview survey with the executing agency.

this project is judged to be high because the overall evaluation score is 2.72, which is 80% (2.4) or more of the plan.

3.5 Sustainability (Rating: ②)

3.5.1 Institutional /Organizational Aspect for Operation and Maintenance

3.5.1.1 State Forest Department

The State Forest Department is the executing agency of this project and performs the maintenance management of afforestation areas and monitoring of the VFC management.

For the monitoring system at the time of the ex-post evaluation, range offices send monthly reports to district offices, circle offices, and state executing units. The monitoring was performed by the circle office with jurisdiction down to the field. Written reports are required monthly according to the regulations, but there are also weekly reports, and most recently, reports can be prepared any time on illegal activities associated with fires and forests using videos and mail through SNS.

The Formulation Evaluation Monitoring and Statistics (FEMAS) was established as an internal monitoring team at the state level, performing field surveys at irregular intervals to confirm current conditions and preparing reports. It surveyed, especially focusing on micro credit and the survival rate of planted trees, and prepares survey reports separately from regular monitoring and reports.

The Forest Department of the Tamil Nadu State takes on all responsibilities of the project activities, and the organizational system has not changed from the appraisal to ex-post evaluation. The division of tasks for each position is clear, and cooperation system from the top level, the Forest Department, to the field level is strong. Close communications and reports are maintained.

At the ex-post evaluation, the number of staff at the Forest Department was 10,603,⁵⁷ but in the future the number is to be reduced due to budget austerity. To cope with this, the Forest Department plans to strengthen the function of VFC as a forest protection agent⁵⁸

Table 18 Stakeholders and Responsibilities & Duties (Actual)

Administrative Level	Responsibilities & Duties	Main Supervisors	Document Report System
The State Forest Department	State-wide Supervision	Principal Chief Conservator of Forest Additional Principal Chief Conservator of Forest	
Circle Offices	Supervision of multiple districts	Chief Conservator of Forest	Quarterly reports to the State Forest Department
District Offices Division Offices ^{Note 1)}	In charge of afforestation and forest conservation of overall districts and divisions	Deputy Conservator of Forest Assistant Conservator of Forest	Quarterly reports to the circle offices
Range Offices	In charge of afforestation and forest supervision in the range	Ranger Forester	Monthly report to the division offices
Beat Office ^{Note 2)}	In charge of forests across multiple administrative villages (24-hour system)	Forest Guard Watcher	Monthly report to the range offices

Source: Prepared from the results of the interview survey with the Forest Department.

Note 1) One office might play roles of both district and division offices.

Note 2) Beats offices monitor watchers who work in peripheral villages.

⁵⁷ Responses to the executing agency questionnaire.

⁵⁸ Results of the interview survey with the Forest Department.

3.5.1.2 VFC

VFC are an organization based on the Tamil Nadu Society Act as described above and are audited every year. Five to 15 at maximum members are selected for the executive committee of VFC, and one male and one female shall be selected from the same village. The term of each committee member is five years, and the same member can be elected up to two terms. The executive committee holds a meeting every month, and VFC members hold one meeting every quarter on principle. Members attend one meeting every six months. Topics of VFC meetings include allocation and recovery of loans, afforestation, prevention measures of livestock entering forests, and so on. At the time of ex-post evaluation, a microplan was being renewed.

Regarding the revolving fund, when averaging the data submitted from each circle at the time of the ex-post evaluation, the repayment rate of micro credit was 78% and the revolving rate of micro credit funds was 2.45 times.⁵⁹

The surplus of the revolving fund⁶⁰ is being used as the village forest fund for welfare of VFC villages (educational fund support, infrastructure repairs in villages, etc.).⁶¹

Since VFC are in a position as society, the Forest Department has a plan to establish a federation so that members would be able to trade Non-Timber Forest Products (NTFP) such as fruits, spices, fiber, resin, and so on, at the scale of a larger organization, and to act collectively.

3.5.1.3 SHG

SHG organizations consist of 15 to 20 members. Reasons for inability to repay the micro credit included a lack of money due to issues of income, high interest, and intentionally not paying since there were other members who were not repaying, in hopes that the loan might be cancelled.⁶² At the time of ex-post evaluation, the evaluator were unable to confirm the ratio of SHG that were continuing income generating activities.⁶³

In relation to the organizational activity system of VFC and activities of SHG at the time of ex-post evaluation, since there are various cases as to the actual condition of micro credit, and there are cases in which it is at least financially dormant there remain issues. The system of operation and maintenance at each level of the executing agency is established. Therefore it is judged that there is almost no problem.

3.5.2 Technical Aspect of Operation and Maintenance

In terms of technical knowledge of Forest Department staff, training was provided to suit individual levels to strengthen technical and management skills of staff.⁶⁴ Training assessments were conducted to implement training, and based on such assessments, specialized agencies developed educational materials and provide actual training. According to interviews conducted at each level of office in the Forest Department, management of resident participation and micro

⁵⁹ The revolving ratio is the ratio of the total amount of refinancing amount to the amount of funds created.

⁶⁰ Surplus funds of a certain amount not used for micro credit.

⁶¹ Responses to the executing agency questionnaire.

⁶² *Tamil Nadu Afforestation Project, Socio Economic Studies, Final Report – Phase 2 by Economic Perspectives.* Information from VFC members of 27 villages through proportional sampling of climate zones.

⁶³ Responses to the executing agency questionnaire. SHG formed by this project (SHG of VFC) has been formed. There are also SHG which has dissolved due to the difficulty of fund management and business ups and downs, but there are also SHG which is continuing. In addition, SHG formed by other projects may be permitted to newly enter the lending of this project, and these SHGs are formed separately by age group, caste class, residential area, etc. These SHGs, which is not SHG of VFC, may be continued in some cases. Even in the visited village, the evaluator could not grasp the total number of SHG.

⁶⁴ The result of the interview survey with the executing agency staff.

credit was performed with the corporation of NGO in relation to guidance and facilitations, by instructing activities of VFC with NGO, the Forest Department staff had an opportunity to have conversations with local residents and gained an attitude of encouragement to facilitate participation in VFC⁶⁵. Manuals below were prepared through this project and were used in the training described above:

- *A comprehensive training manual on gender mainstreaming, micro finance and micro credit, and poverty alleviation*
- *Training Manual for the Trainers' Training Program*

TBGP uses these manuals prepared for TBGP.

In Phase I, the forest area where afforestation was done in extensive areas, so intensive care was not given for planting trees. Given that, Phase II training provides detailed and practical contents, such as handling and planting of seedlings and prevention of livestock and people from entering forests after planting, allowing for learning more concrete implementation methods of JFM.⁶⁶ The Tamil Nadu Forest Academy has prepared and organized manuals for afforestation and forest conservation, and provides training of trainers (TOT) according to the level of knowledge and technical skills of individual staff. Since Phase I and the present project have been continuously executed for about 20 years, field staff were mostly aware of forest management techniques that focused on residents and developed a good relationship with VFC in terms of forest management. Therefore, there is no technical problem with operation and maintenance of afforestation.⁶⁷

3.5.3 Financial Aspect of Operation and Maintenance

3.5.3.1 The State Forest Department

The finance of the State Forest Department is made of fixed cost and personnel cost from the state government, state government project cost, central government project cost, and state/central government joint project cost. With the austerity finance, personnel cost is scheduled to be reduced. Other project costs were being reduced every year, as well, and the total budget was decreasing. Since the number of field staff in charge in the Forest Department was to be reduced, a policy was set up to enhance VFC instead of relying on the Forest Department. A budget of 98,495,000 rupees was set aside for this purpose for the 2017-2018 fiscal year.

Table 19 Annual Budget Status of the State Forest Department ^{Note 1)} (unit: 100,000 rupees (lakhs Rs))

	2014/15	2015/16	2016/17	2017/18 ^{Note 2)}
Fixed Cost/Personnel Cost ^{Note 3)}	35,508.97	42,744.45	43,134.53	33,924.44
State Government Project Cost	26,479.03	19,293.43	13,579.08	13,049.15
Central Government Project Cost	2,184.62	3,070.95	2,452.94	3,497.55
State/Central Government Project Cost	820.03	1,610.85	1,294.91	1,355.51
Total	64,992.65	66,719.68	60,461.46	51,826.65

Source: The State Forest Department.

Note 1) The Indian fiscal year is from April to the next year March.

Note 2) Requested budget for 2017/2018.

Note 3) Materials provided by the state government.

⁶⁵ The result of interviews with the Forest Department staff.

⁶⁶ The result of interview survey with Forest Department staff.

⁶⁷ The result of interview survey with Forest Department staff.

Table 20 Maintenance Budget Secured for Project (FY 2017/2018) (Unit: 100000 rupees (lakhs Rs))

Details	2017/18
[Strengthening of JFM Organization for Phase 1 and this Project] • Organization of federation that includes expansion of VFC office functions. • Preparation of updated microplan.	318.70
[Increasing NTFP Profits] • Survey on NTFP and medicinal plant resources, a management plan that is linked to the market. • The marketing department was established in the Forestry Extension Center, and NTFP resources are managed and utilized.	87.00
[Maintenance of Community Assets] • Repair to check dams and percolation ponds built in this project.	579.25
Total	984.95

Source: Responses to the executing agency questionnaire.

The allocation of profits (actual) was the same as that assumed at the appraisal, according to the allocation principle shown in Table 21. Since planted trees were young, except for thinned wood from some trees and green leaves after pruning, there was hardly profit from planted trees yet. Regarding the collection of NTFP, permission was supposed to be issued based on judgment of the forest situation by the range office, but it was confirmed that some VFC villages collected NTFP.

Table 21 Allocation of Benefits between the Forest Department and VFC (Policy) (unit: %)

Items	Forest Department	VFC
Fuel Wood	0	100
Livestock Feed, Green Leaf Manure	0	100
Timber	10	90
Poles, Bamboo	10	90
Non-Timber Forest Product(NTFP)	0	100

Source: Responses to the executing agency questionnaire.

3.5.3.2 VFC

VFCs were being audited every year based on the Tamil Nadu Society Act. As discussed above, regarding the revolving fund, the repayment rate of micro credit was 78% and the revolving rate of small funds was 2.45 times, based on the average of documents submitted from each circle office at the time of ex-post evaluation.⁶⁸

The surplus of the revolving fund was being used for welfare of VFC villages as village forest funds (education support, repair of village infrastructure, etc.), but some VFC defaulted funds due to non-payment from SHG or individuals, which became dormant funds at a bank.⁶⁹

The Forest Department, considering future financial sustainability, made a plan that allows for establishment of a federation and collective activities, so that VFCs that play a role in society can trade NTFP as a larger organization. This plan will allow members of VFCs to routinely receive profits after a certain period. The measures are being considered including the option that VFCs can trade nuts, oil (wax, lacquer, etc.), medicinal trees and herbs, bamboo materials, vines, tree barks, and saps jointly without a commodity broker so that they can receive practical

⁶⁸ Results of the executing agency's questionnaire.

⁶⁹ Results of the field survey interview.

profits when trees grow and mature.⁷⁰

As mentioned above, although the staff tends to be reduced due to austerity finance as the budget of the State Forest Department, in response to the decline of the staff who supervises the on-site, a policy was set up for VFC staff to take over monitoring by strengthening the role of the VFC, and a budget was put aside for this purpose. However, there were some issues with the financial sustainability of VFC, and the State Forest Department was attempting to strengthen their finances by forming a federation and increasing profit from NTFP. Though issues remained, since the Forest Department understood the issues and was searching for solutions, financial sustainability is considered moderate.

3.5.4 Status of Operation and Maintenance

Each division office was supposed to conduct management and maintenance of afforestation areas based on the working plan.⁷¹ For VFC, microplans were formulated with residents in the beginning, but at the time of the ex-post evaluation, NGOs were appointed to follow up on the project, and microplans were being renewed jointly with VFC.

Seedlings that died or were injured within two years of planting were replaced in the supplementary planting. Watering depended on the amount of precipitation in the community, but was usually performed continuously for three months following planting and supplementary planting. For three months after the planting of trees, access to afforestation areas was prohibited. Since afforestation areas required professional protective surveillance, watchmen of the Forest Department cooperated with forest guards to conduct 24-hour monitoring. These staff and those of range offices corresponded to the protection and control of pests.

The Forestry Extension Center was being used for training in afforestation and compost making for farmers and residents as part of the present project of TBGP, and there is a budget put aside to reinforce the facility building.

Soil and moisture conservation facilities were being repaired by the Forest Department. For repair of small infrastructure facilities by other departments, VFC applied for the departments in charge and requested for repair.⁷²

During Phase 1, a forest cover rate map was prepared, which clearly displayed reforestation and reduction of forest, showing issues for each district. In this project, a map of forest types was prepared, and another map was created to show forest vegetation across the state. Though not for this project specifically, a geographical map of forest fire conditions was also developed, which can be confirmed on the Geomatic Center page of the state Forest Department website.

In light of the above, duties and roles for positions that perform maintenance of afforestation are clear, and a collaboration system is established from the Forest Department Headquarters to the field. From a technical perspective, training is provided according to needs, and technical skills required for each task are being strengthened. From a financial perspective, although the

⁷⁰ The assumption on how many years later NTFP will be harvested depends on the type and growth situation of NTFP.

⁷¹ The project plan was approved for 10 years of forest conservation, plant regeneration, and tree planting by the state Forest Department after its approval by circle offices.

⁷² A report to the executing agency is not required for repairing village infrastructure; thus, we were unable to understand the present condition of facilities and their state of repair (responses by the executing agency).

staff of the forestry department tends to be reduced, by strengthening the VFC, the budget is secured so that the forest preservation policy can be continued without delay. Budgets are also secured by state government that emphasizes forest preservation. The income improvement activities of SHG are conducted by funds provided by the VFC Fund and the VFC Fund remains as issues. The situation of management related to forests and afforestation is almost favorable. Judging comprehensively, the sustainability is high.

4. Conclusions, Lessons Learned, and Recommendations

4.1 Conclusions

This project was implemented with the aim to regenerate forests and improve the standard of living of local residents by afforestation and livelihood improvement activities using the community participatory method at the village level in the state of Tamil Nadu in the south-east of India, thereby contributing to the improvement of the local socio-economic situation.

This project is highly relevant, as it is consistent with priority areas in the development policy of India's and Japan's ODA policy, and also with development needs. The efficiency is high, as its cost and duration were within the plan. The afforestation was implemented mostly according to the plan, with a high survival rate of planted trees and forest regenerated. In addition, it is recognized that the annual income of the targeted villages has increased because of income gained from small scale business using micro credit implemented through this project at least for a certain period. Therefore, the effectiveness is high. The rise of the groundwater level has been confirmed by survival of planted trees and improvements of the soil conservation facilities, and the impact such as the diversification of the cropping items emerged. Residents' awareness of forest protection and nature conservation also increased, forest fires decreased, and trees are being protected through appropriate management of livestock. Social fencing, which monitors illegal grazing and felling trees, has also been established. As such, the effectiveness and impact of the project are both judged as high. The operation and maintenance system of the executing agency is well established; there is no problem with technical capabilities and the project is mostly maintained. Although there are a few issues remaining with the financial sustainability of village forest councils, the sustainability of the effects emerged by this project is high.

In light of the above, the evaluation result of this project is highly satisfactory.

4.2 Recommendations

4.2.1 Recommendations for the Executing Agency

None.

4.2.2 Recommendations for JICA

None.

4.3 Lessons Learned

Setting Appropriate Effectiveness Indicators

Effectiveness indicators was set "forest cover rate (crown density) in the afforestation target area" at the time of the appraisal of this project according to JICA provided materials. However, the forest cover rate and the crown rate were monitored only at the district unit and the effect

emergence could not be sufficiently confirmed. It is desirable to accurately represent the effectiveness of the project objectives and to set indicators that can be monitored by the executing agency.

As the indicators on living standards, at the time of appraisal, an income increase by 10% for target households on average was set as a target to be achieved two years after completion of the project. However, there are other factors affecting on the increase other than the project. At the time of appraisal it was required to set the indicator properly (considering other influencing factors) and to clearly indicate the measurement method.

For the appropriate ex-post evaluation, the validity of operation and effect indicators should be discussed at the time of the appraisal with experts and measurement methods for indicators should be clarified. It is important to keep records on those indicators and the measurement methods in the agreement document at appraisal. Since the target indicators for the effectiveness are also referred for monitoring during implementation and post-monitoring and are keys to overall project management, the sufficient and appropriate investigation of those indicators by stakeholders at the time of planning and appraisal is required.

Financial and Organizational Sustainability of VFC and Necessity to Examine Future Direction of JFM.

In this project, with the support of the Forest Department and NGOs, a VFC consisting of settlements living around afforested areas was formed and most of VFCs consisted of the settlements include SC and ST. VFC was formed on condition that it was affected by living and agriculture due to deforestation and deforestation of forests. Though VFC is an organization based on the Society Act, at the time of ex-post evaluation, it is planned to upgrade VFC as a part of administrative organization in the administrative village, and establish a VFC federation in order to sell forest products and non-timber forest products etc. Such a plan to strengthen VFC institutionally and financially is proposed by the Executive Agency.

At the time of ex-post evaluation, economic status had changed notably, compared to 10 years ago when VFC were established. A rapid economic growth of the state of Tamil Nadu activated seasonal labor and migrant labor, leading to VFC in which members are absent for a long period of time. In addition to profits from forests and micro credit, income from migrant labor of family members makes up a large portion of household income. Micro credit is at a turning point in which their value must be further examined through future surveys. This evaluation did not make specific and empirical comparisons of these micro credit with those of other organizations. However, since the repayment rate of micro credit is low, and some VFC and SHG are dormant, considering the future direction of JFM, micro credit that had previously been an incentive to residents must be reconsidered. While doing so, some members of target villages in Tamil Nadu were utilizing micro credit from NGOs. The amount of loans are large and the repayment rate is also high with the framework of this loan under strict regulations. Thus, it would be necessary to make a comparative examination on micro credit with those of the other organizations.

Comparison of the Original and Actual Scope of the Project

Items	Plan	Actual
1. Project Outputs	(1) Afforestation project 1) Afforestation area IWDP 162,500 ha ITDP 15,000 ha 2) Number of trees planted 34,150,825 3) Number of supplementary trees planted 6,550,000 4) Number of Employers (day/number of people) 16,590,000 5) Soil and moisture conservation activities a. check dams 4,152 b. percolation ponds 1,177 (2) Number of VFC established 800 (3) Number of SHG established 1,600 (4) Community development water tanks, roads, VFC offices, etc. 3,657 (5) Forest management facilities 1) Field staff dorms 575 2) Field staff offices 61 3) Rest Houses 29 (6) Forestry Extension Center 11 (7) GIS 1) GPS 300 2) Computers for training 6 3) Topographic data purchased 22 4) GIS software 13	(1) Afforestation projects 1) Afforestation area IWDP 189,250 ha ITDP 19,300 ha 2) Number of trees planted 39,991,825 3) Number of supplementary trees planted 9,808,682 4) Number of Employers (day/number of people) 20,440,000 5) Soil and moisture conservation activities a. check dams 5,271 b. percolation ponds 2,026 (2) Number of VFC established 950 (3) Number of SHG established 3,283 (4) Community development water tanks, roads, VFC offices, etc. 4,393 (5) Forest management facilities 1) Field staff dorms 575 2) Field staff offices 61 3) Rest Houses 29 (6) Forestry Extension Center 11 (7) GIS 1) GPS 329 2) Computers for training 6 3) Topographic data purchased 23 4) GIS software 15
2. Project Duration	March 2005–March 2013 (97 months)	March 2005–March 2013 (97 months)
3. Project Cost		
Foreign Currency	450 million yen	(N/A)
Local Currency	13,169 million yen (5,487 million rupees)	(N/A)
Total (ODA Loan)	13,619 million yen 9,818 million yen	13,198 million yen 9,199 million yen
Exchange Rate	1 rupee = 2.40 yen (August 2004)	1 rupee = 2.15 yen (average from March 2005 to March 2013)
4. Final Disbursement	July 2015	

Appendix 1. Water Table Data

Climate zone	Annual mean precipitation (2006-2010)	Name of villages	Rise in water table
Cauvery Delta Zone	696 mm	Osarapalli Nagar Mahilampadi Kancherimalai	4 m 1 – 2 m 1 – 2 m
North Eastern Zone	882 mm	Kumaramangalam 3 Villages Keel Kottaiyur	3 m 1 m 0
North Western Zone	844 mm	Kollankuttai Paithur Pappanaikkanpatti Chinnerikkadu Kalrampatti	3 m 3 m 1 m 1 m 0
High Altitude Zone	813 mm	Beeranapalli Achampatti	3 m 1 m
Western Zone	844 mm	Goundanpalayam Pudukkadu Indiranagar Masagoundanur Masakalipatti Periyakalipatti	3 m 1 m 1 m 0 0
Southern Zone	990 mm	Chinamuliyur Pillayarnatham Tkolingipatti Karuppanadhi Palayar Kudiyiruppu TNadar Sanga Theru Rajapalayam Samathuvapuram	3 m 1 m 1 m 1 m 1 m 1 m
High Rainfall Zone	1,986 mm	Vellambi	1 m
		Total number of villages, 27	The number of villages that experienced rise, 24

Source: *Water Table Status Study Report, 2011*

Note) Water tables in 135 wells in 27 villages were measured every month. The sampling method of 27 villages was not clearly stated in the report.

India

FY2017 Ex-Post Evaluation of Japanese ODA Loan Project
"Tamil Nadu Investment Promotion Program"

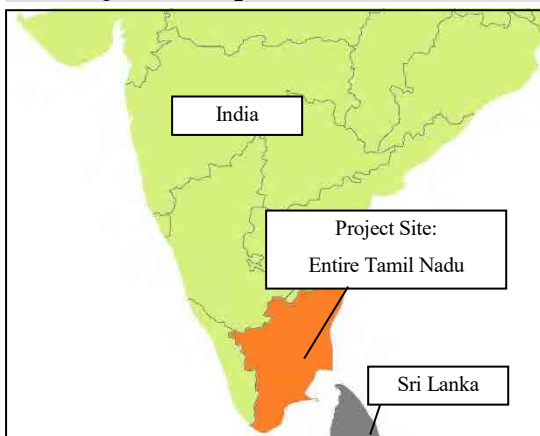
External Evaluator: Shuji Shimizu, Alfapremia Co., Ltd.

0. Summary

The objective of this program is to attempt to streamline the investment climate in Tamil Nadu in southern India through encouraging the improvement of the policy and institutional framework to promote the investment as well as the early implementation of projects enhancing the quality of urban infrastructure mainly of roads, electric power, water supply and sewerage and other infrastructure facilities, thereby contributing to improvements to the state's investment environment.

This program complies with the development policies and needs of India and Tamil Nadu as well as with Japan's ODA policy. This program is also suitable in terms of its program planning and approach. Therefore, its relevance is high. Moreover, the target quantitative effects have largely been achieved as a result of this program, and the program appears to be proceeding steadily. Furthermore, in terms of qualitative effects, economic development in Tamil Nadu as well as contribution to continued investor involvement by the small infrastructure projects facilitated as part of this program have been observed. Therefore, the effectiveness and impacts are high. Nevertheless, continued monitoring of future applications on the Single Window Web Portal is necessary since this ex-post evaluation was conducted right after its launch. Regarding the sustainability of the initiatives to improve the investment environment, the composition of organization and roles of the related institutions involved in the Tamil Nadu Investment Promotion Program (Phase 2), which is a continuation of this program, is verified. Moreover, from a financial perspective, its sustainability can be deemed to be guaranteed, as sufficient funds have been allocated to the relevant departments by the state government for policy and institutional reform and for infrastructure development.

1. Project Description



Program Location



Athipattu Rail Over Bridge
Built as Small Infrastructure Project

1.1 Background

Since India introduced its full-scale liberalization policy in 1991, its economy has maintained steady growth. India's 11th Five-Year Plan (April 2007 to March 2012) resulted in an annual average economic growth rate of more than 8%, and GDP per capita based on purchasing power parity (PPP) exceeded \$3,600 in 2011. Increased individual consumption is expected to lead to a further increase in domestic demand, which, in turn, strengthens foreign direct investment in India. Tamil Nadu, located in southern India, has good maritime connections with Southeast Asia, has an abundant labor force, and is consistently implementing measures to attract foreign capital, which have contributed to the annual increase in investments from foreign investors including Japanese firms.

Meanwhile, delay in development of investment climate in both physical and institutional infrastructure came to the surface as a hindrance against the tremendous willingness of foreign direct investment. The proposal for promoting investment for the Government of India submitted in February 2012 by the Japan Chamber of Commerce and Industry in India include issues and reform approaches for promoting investments. Similarly, the Japanese Chamber of Commerce & Industry, Chennai submitted proposals for the Government of Tamil Nadu, requesting infrastructure improvements in the form of roads, electric power, water supply and sewerage, and so forth. The World Bank has also pointed out that the infrastructure environment, institutions, and procedures of the investment environment in Chennai, the capital of Tamil Nadu, are insufficient (*Doing Business in India 2009*). Thus, delays in creating a better investment environment have become a serious issue for the promotion of foreign direct investment in Tamil Nadu.

1.2 Project Outline

The objective of this program is to attempt to streamline the investment climate in Tamil Nadu in southern India through encouraging the improvement of the policy and institutional framework to promote the investment as well as the early implementation of projects enhancing the quality of urban infrastructure mainly of roads, electric power, water supply and sewerage and other infrastructure facilities, thereby contributing improvements to the state's investment environment.

Loan Approved Amount/Disbursed Amount	13,000 million yen / 12,987 million yen	
Exchange of Notes Date/Loan Agreement Signing Date	November 2013 / November 2013	
Terms and Conditions	Interest Rate	1.4%
	Repayment Period (Grace period)	30 years (10 years)
	Conditions for Procurement	General untied
Borrower / Executing Agency	The President of India / Finance Department, the Government of Tamil Nadu	
Program Completion	March 2016	
Main Contractor(s) (Over 1 billion yen)	None	
Main Consultant(s) (Over 100 million yen)	None	
Related Studies	Technical Cooperation (Dispatch of Experts) "Technical	

(Feasibility Studies, etc.)	<i>Assistance related to Sector Program Loan for Improving the Investment Environment of Tamil Nadu, India" (2012)</i> <i>Technical Assistance related to Japanese ODA Loan "Tamil Nadu Investment Promotion Program (Program Implementation Promotion)" (2013-2014)</i> <i>Technical Assistance related to Japanese ODA Loan "Tamil Nadu Investment Promotion Program (Program Implementation Promotion)" (2014-2015)</i> <i>Technical Assistance related to Japanese ODA Loan "Tamil Nadu Investment Promotion Program (Assistance for Training Industry Human Resources)" (2015-2016)</i>
Related Projects	<i>Japanese ODA Loan "Tamil Nadu Investment Promotion Program (Phase 2)" (March 2017)</i>

2. Outline of the Evaluation Study

2.1 External Evaluator

Shuji Shimizu, Alfapremia Co., Ltd.¹

2.2 Duration of Evaluation Study

This ex-post evaluation study was conducted with the following schedule.

Duration of the Study: September 2017 to January 2019

Duration of the Field Study: November 26 to December 8, 2017, April 2 to April 6, 2018

2.3 Constraints during the Evaluation Study

2.3.1 Revision of Program Objective

The program objective at the time of appraisal was as follows.

“The objective of this program is to further improve the investment climate through strengthening the policy framework and enhancing the quality of urban infrastructure mainly of roads, electric power, water supply and sewerage and other infrastructure facilities, thereby attempting to increase foreign direct investments in the state.”

At the time of ex-post evaluation, it is difficult to establish a direct causal relationship between this program and increases in foreign direct investment. As such, the Evaluator incorporated a short-term impact (“improving investment environment”) and a medium-term impact (“increasing investor interest”) that precedes the long-term impact (“increasing foreign direct investment”) between the output (“development of the investment environment”) and the impact (“contributing to increases in foreign direct investment”). Moreover, the medium-term and long-term impacts were only analyzed without including them in the decision for this evaluation.

¹ Joined as an external evaluator of Alfapremia Co., Ltd. from Japan International Cooperation System.

Table 1 Revision of Impact

Stage	Impact Contents
Impact 1 (Short Term)	Improving investment environment
Impact 2 (Medium Term)	Increasing investor interest
Impact 3 (Long Term)	Increasing foreign direct investment

Source: Evaluator

2.3.2 Evaluation Scope

This program is a Development Policy Lending. In this type of program, the government of a developing county is encouraged to implement reforms through policy dialogue and is provided with funds once the reforms are accomplished. The funds provided are not earmarked but are included in the general account budget. As a result, it is difficult to quantitatively compare inputs (expenses) and outputs (achievements), which is why efficiency is excluded from the analysis and evaluation. Sustainability is included in the analysis, but it is not subject to evaluation scope, and no sub-rating is conferred. Since no sub-rating is conferred on efficiency and sustainability, an overall rating is not conferred either.

3. Results of the Evaluation

3.1 Relevance (Rating: ③²)

3.1.1 Consistency with the Development Plan of India

At the time of appraisal, the Government of India intended to invest around US\$1 trillion in infrastructure over five years and develop the investment environment as part of the *12th Five-Year Plan (April 2012 to March 2017)*. Moreover, as part of the *Chennai-Bengaluru Industrial Corridor (CBIC)*,³ Tamil Nadu was identified as a vital region for Indian economic growth. Furthermore, *Vision Tamil Nadu 2023*, which was announced in March 2012, aims to increase the state's GDP growth rate and per capita income through 2023 and identified the acceleration of private investments through investment environment development as an important policy.

At the time of ex-post evaluation, the *Three Year Action Agenda 2017-18 to 2019-20*⁴ was announced in place of a five-year plan, in accordance with Modi administration policy.⁵ This action agenda discusses actions for increasing productivity and creating jobs in each industry,⁶ including promoting foreign direct investment in a variety of industries, such as manufacturing, services, transportation, communications, and energy. Moreover, to promote foreign direct investment, regulations also need to be reformed.⁷ At the time of ex-post evaluation, Tamil Nadu was continuously using the policies and contents of *Vision Tamil Nadu 2023* as the basic principles for its policies.

From the above, it can be concluded that this program conformed with the development policies

² ③: High, ②: Fair, ①: Low

³ This plan was agreed upon at the Japan-India Summit in December 2011. The Master Plan was completed in July 2015, prioritizing the formulation of comprehensive regional development for 2014-2033, the identification of key development areas, and individual projects.

⁴ The Indian fiscal year starts in April and ends in March of the following year, so FY2017 corresponds to April 2017 to March 2018, and FY2019 corresponds to April 2019 to March 2020.

⁵ Narendra Modi, 18th Prime Minister of India. In office from May 2015 until the present.

⁶ *Three Year Action Agenda 2017-18 to 2019-20*, p. 33.

⁷ *Three Year Action Agenda 2017-18 to 2019-20*, p. 127.

of the Government of India and the Government of Tamil Nadu at both the time of appraisal and the time of ex-post evaluation.

3.1.2 Consistency with the Development Needs of India

3.1.2.1 Funding Needs

Table 2 shows the state budget balance of the Government of Tamil Nadu.

Table 2 State Budget (million rupees)

Item	FY2012	FY2013	FY2014	FY2015
Revenue	883,828	998,853	1,086,564	1,237,712
Spending	1,056,568	1,164,055	1,292,399	1,509,499
Balance	△172,740	△165,202	△205,835	△271,787

Item	FY2016	FY2017	FY2018	
Revenue	1,296,917	1,491,572	1,646,456	
Spending	1,623,192	1,896,910	2,066,224	
Balance	△326,275	△405,338	△419,768	

Source: Response from the Finance Department

Based on data from India, this program corresponds to 7,700 million rupees. If that amount is compared to the annual budget balances, it is observed that the amount that Tamil Nadu received as an ODA loan is an average of 3% of the budget balances, which is not very substantial at either the time of appraisal or the time of ex-post evaluation. However, each of the 22 small infrastructure projects promoted as part of a policy action of this program is individually important for developing the investment environment, but none of them is large enough to comprise an entire Japanese ODA Loan project. By providing financial assistance, which is highly concessional, in the form of Development Policy Lending, Tamil Nadu could facilitate infrastructure development at its helm in agreement with their funding needs at the time of appraisal.

Moreover, at the time of appraisal, Tamil Nadu needed to promote policies to improve the investment environment and required funds to do so, but Japan was the only donor of financial assistance for the purpose of policy implementation rather than that of individual projects. Furthermore, the interest rate, repayment period, and other conditions proposed by Japan were more favorable than those offered by the domestic market or other donors.

The need to promote policies to improve the investment environment, with a focus on infrastructure development, remains at the time of ex-post evaluation, and the *Tamil Nadu Investment Promotion Program (Phase 2)* (hereinafter referred to as “TNIPP Phase 2”) was commenced in March 2017.

3.1.2.2 Infrastructure Needs

According to the documents provided by JICA, investors asked the Government of Tamil Nadu for the development of infrastructure, such as electric power, roads and logistics, and water supply and sewerage, prior to the start of this program. The electric power provided failed to satisfy investors in terms of both supply and quality, with issues including power flickers, voltage fluctuations, and unstable frequencies. The roads suffered from serious traffic congestion, and improved access from the investors’ production bases (i.e., factories) to the port (i.e., Ennore Port) was needed. It was also suggested that the construction of logistics facilities could be an effective

countermeasure to the serious congestion. Moreover, as the amount of water that could be drawn from underground was limited, investors saw a need to secure a stable water supply in order to maintain factory operations.

At the time of ex-post evaluation, improvements were confirmed to be made with regard to these needs (see the section on Effectiveness for details). Infrastructure development also needs to be sped up for TNIPP Phase 2, so the plan is to further develop electric power, roads, water supply and sewerage, and other forms of infrastructure.

3.1.2.3 Institutional and Procedural Reform Needs

According to the documents provided by JICA, investors had asked the Government of Tamil Nadu for a wide range of improvements, including infrastructure project coordination and prioritization; an improved investment application process; system integration for investors; the promotion of a business environment for micro, small, and medium enterprises (MSMEs); human resource development; a land pooling system⁸ (hereinafter referred to as “LPS”); and Master Plan/Land-use Conversion, prior to the start of this program.

Investors were also worried that the Government of Tamil Nadu would not disclose information about the prioritization of infrastructure projects in Tamil Nadu. Moreover, some aspects of the legal system related to the approval of investments were created in the 1970s and are unsuitable for economic activities today. Some investors also felt that it was difficult to apply for investment approval for reasons such as language barriers, complicated procedures, customs, regulations (architectural criteria or labor regulations), and so forth. In the case of large investments,⁹ the Tamil Nadu Industrial Guidance & Export Promotion Bureau (hereinafter referred to as the “Guidance Bureau”), which operates under the Industries Department, existed as a contact point for investors, but no equivalent contact point existed for micro, small, and medium investments.¹⁰ As a result, micro, small, and medium investors had to submit each application to multiple departments, placing the burden of these complex procedures on the investors. Moreover, the expansion of the manufacturing industry required human resources with knowledge and experience relevant to manufacturing technology, such as knowledge about electricity and machines or basic skills for using tools. As the manufacturing industry also needs vast plots of land for factories and so forth, an LPS and Master Plan were both needed to quickly secure land. At the time of ex-post evaluation, improvements were confirmed to be made to meet all of these needs except for those related to an LPS and Master Plan. However, it is observed that efforts continue to be made to accomplish policy actions related to an LPS and Master Plan (see the section on Effectiveness for details). Furthermore, since the start of TNIPP Phase 2 in March 2017, plans have been made to further promote the training of industry human resources, to further improve the capacity of the Guidance Bureau and

⁸ An LPS is a system of developing infrastructure for acquired land and returning a portion of the land to the owners. The owners’ land shrinks in size, but its value increases due to the infrastructure development, which more than makes up for the loss of land. The development authorities also benefit, as they no longer have to prepare a land purchase budget and face fewer budgetary constraints for development.

⁹ Large investments are defined as those of 100 million rupees or more.

¹⁰ Micro investments are defined as those under 2.5 million rupees, small investments are defined as those under 50 million rupees, and medium investments are defined as those under 100 million rupees.

other departments involved in investments, and to create contact points for and further improve information sharing with MSMEs.

3.1.3 Consistency with Japan's ODA Policy

In Japan's *Country Assistance Policy for India (May 2006)*, the Government of Japan explained that it would provide infrastructure assistance to expand foreign investment (physical) and assistance in reforming policies and institutions to improve the outcomes of infrastructure projects (institutional) in India's six metropolitan areas (Delhi, Mumbai, Kolkata, Bengaluru, Hyderabad, and Chennai).

In October 2010, the *Comprehensive Economic Partnership Agreement between Japan and the Republic of India* was concluded. In January 2011, the Japanese Ministry of Economy, Trade and Industry and the Government of Tamil Nadu issued a memorandum on infrastructure development assistance in the state and agreed to collaboratively attract investments from Japanese companies and improve the state's investment environment.

Moreover, *JICA Country Analysis Paper (March 2012)* identified "the development of industrial and urban infrastructure" as a focus area in India and outlined the active use of ODA to improve the infrastructure and investment environment not only for Japanese companies but for regional industry as a whole. As such, this program conforms with the Japan's ODA policy at the time of appraisal.

3.1.4 Appropriateness of the Project Plan and Approach

At the time of appraisal, there was a need to promote infrastructure projects crucial for developing the investment environment, but each individual project was too small for a Japan's ODA Loan. As such, it was appropriate to try to develop the investment environment using Development Policy Lending. Moreover, this program took a suitable approach in that its policy actions and the identification of infrastructure projects to promote took into consideration not only the strategy outlined in *Vision Tamil Nadu 2023* but also the requests of the corporate members of the Japanese Chamber of Commerce & Industry, Chennai.

When it comes to Development Policy Lending, funds are paid in response to the progress of policy actions. As a result, this framework is highly transparent, as the supervision of progress was conducted by both countries who confirmed the progress of the program as appropriate. This approach was suitable. Furthermore, comments from the Government of Tamil Nadu are indicating that the processing ability of the program has increased and that proactive action has become possible in preparation for TNIPP Phase 2. These actions have included discussing and implementing measures as needed after confirming the program's progress with JICA, smoothly conducting meetings based on a deeper understanding of industry needs, and collecting sufficient information in advance with the help of JICA experts.¹¹ Thus, the program took a suitable approach to the supervision of progress.

¹¹ For this program, experts in charge of program implementation promotion were dispatched as Technical Assistance Related to Japanese ODA Loan from 2013-2014 and 2014-2015.

This program has been highly relevant to the country's development plan and development needs, as well as Japan's ODA policy. Its planning and approach are also suitable. Therefore its relevance is high.

3.2 Effectiveness and Impacts¹² (Rating: ③)

3.2.1 Effectiveness

3.2.1.1 Achievement Status of Policy Actions

Under this program, policy dialogue has taken place between the Government of Tamil Nadu and JICA, and a policy matrix was established for this program. The policies (tasks) and objectives included in the policy matrix are as indicated in Table 3.

Table 3 Policy Matrix (Policies [Tasks] and Objectives)

Policies (Tasks)	Objectives
Infrastructure project coordination and prioritization	*The Tamil Nadu Infrastructure Development Board (hereinafter referred to as "TNIDB"), in which the Secretaries of the related regulatory departments participate, will undertake the prioritization of projects and coordination between departments, thus accelerating the projects' implementation. *The Small Infrastructure Project Empowered Committee (hereinafter referred to as "SIPEC") will be established. The SIPEC will allocate budget properly to priority projects selected by the SIPEC. The SIPEC will appropriately monitor and facilitate the priority projects.
Investment application process	*The investment application process, its related regulations, and its operational system will be improved comprehensively according to an overall Business Process Re-engineering (hereinafter referred to as "BPR") study.
System integration for investors	*A tracking system for investors will bring more transparency to the investment application process and will improve investor's satisfaction.
Promotion of business environment for MSMEs	*The function of the Directorate of Industries and Commerce will be enhanced as a single window for MSMEs according to the results of a study related to investment problem of MSMEs. *Preparing a web-based single contact point application system and an Investment Guidebook for MSMEs can streamline investment procedures. *Information dissemination and workshops for attracting foreign MSMEs will be conducted.
Human resource development	*A comprehensive skill development Action Plan will be undertaken, and it will help meet the investors' demand for labor.
LPS	*The Highway and Minor Ports Department will be able to acquire land and compensate land owners through land allocation by utilizing LPS. This scheme will accelerate infrastructure development.
Master Plan / Land-use Conversion	*A new Master plan process will be able to significantly reduce time requirements. By earmarking areas for future industrial development, the time required for Land-use Conversion will be shorter, thus enhancing industrial investment activity.

Source: Based on the documents provided by JICA, but adapted by the Evaluator so that the terms match those found in this report

For each policy (task), actions to be accomplished by the end of FY2012, actions to be accomplished by the end of FY2013 and actions to be accomplished by the end of FY2014 are

¹² Sub-rating for Effectiveness is to be put with consideration of Impacts.

specified. The documents provided by JICA confirm that the actions have largely been accomplished ahead of their respective deadlines. The progress made regarding the small number of partially unaccomplished actions at the time of ex-post evaluation was as follows:

(1) LPS

The policy action related to LPS was partially unaccomplished against the targets. The policy was initially applied in the context of roads and was implemented by an office of the Highways and Minor Ports Department. However, as the Government of Tamil Nadu started thinking about applying this policy to urban development projects as well, the office in charge was changed from the Highways and Minor Ports Department to the Housing and Urban Development Department in October 2013. In July 2016, it was decided that the Land Commission, Revenue Department should make a draft of a Land Pooling Area Development Scheme to ensure that the same LPS policy was implemented across the state, and, in September 2016, the department in charge was changed. At the time of ex-post evaluation, the Revenue Department had summarized the opinions of the relevant departments and made preparations to enact the Land Pooling Area Development Scheme in the form of a government order. As of May 2018, the Legal Department and the Finance Department were verifying the scheme, after which they planned to obtain the approval of the Chief Minister so that a government order could be issued. However, although inquiries were made about the expected timing of the government order, it was unable to obtain a clear answer from the Revenue Department.

Due to the circumstances described above, the formulation of LPS guidelines and the implementation of an LPS pilot project are elements of the policy action that are yet to be accomplished. However, the Housing and Urban Development Department say that they are prepared to respond quickly once the Land Pooling Area Development Scheme is clarified, so it is expected that the unaccomplished actions will be accomplished in the future.

As part of this policy action had yet to be accomplished at the time of ex-post evaluation, the Revenue Department has expressed the need to make adjustments based on the opinions of several involved parties and to respond to comments from the Finance and Legal Departments.

(2) Master Plan/Land-use Conversion

With regard to Master Plan/Land-use Conversion, the operation indicators for Effectiveness have largely been accomplished, as described in section 3.2.1.2 below (i.e., Quantitative Effects (Operation and Effect Indicators), (6) Area Where the Master Plan Is Completed). However, comparing it with the policy action, at the time of ex-post evaluation, the Master Plan objectives remained unaccomplished, and the Master Plans for some of the regions subject to Master Plan Phase I¹³ as well as those for all of the regions subject to Master Plan Phase II were still being formulated. According to the Housing and Urban Development Department, the Master Plan for the Thoothukudi area, which is part of Master Plan Phase I, remained unaccomplished despite having

¹³ Master Plan/Land-use Conversion is divided into Phase I and Phase II in the policy matrix and, together, make up one policy action.

been identified as a model case for the future Master Plan of Tamil Nadu. At the time of ex-post evaluation, consultant selection was still ongoing, and the aim was to complete the plan by 2020. Furthermore, with regard to Master Plan Phase II, the goal was to complete the preparations for formulating the master plans for 17 areas (corresponding to 41% of the target area) by December 2018. The plan was to implement the rest of Phase II in the Coimbatore area, but preparations have only just started, and the formulation schedule remained unclear at the time of ex-post evaluation. As such, it is likely that more time is needed before these objectives can be accomplished, but the efforts to accomplish them are ongoing.

At the time of ex-post evaluation, the Housing and Urban Development Department commented on the fact that this policy action was partially unaccomplished, saying that the size of the areas selected for Master plan exceeded the department's capacity. The Master Plan was initially entrusted to a private consultant, but it was unable to handle the task. Thus, the Master Plan came to be directly managed by employees at the Housing and Urban Development Department, at which point the capacity of the department was exceeded. For future operations, the department is expected to select and commission suitable consultants and fulfill the policy action based on their own experience.

3.2.1.2 Quantitative Effects (Operation and Effect Indicators)

Table 4 Operation indicators

Indicator	Baseline	Target	Actual ^{N1}
	FY2012	FY2014	FY2017
		Completion year	1 Year After Completion ^{N2}
Number of Projects Identified and Prioritized by TNIDB	-	10 projects	Total of 21 projects
Number of Projects Facilitated by SIPEC	-	10 projects	Total of 22 projects
Number of Workshops Conducted for Attracting Foreign MSMEs	-	Twice	Total of 4 times
Number of Trainees under TNSDM ^{N3}	Approx. 50,000 persons	45% increase from 2012	Total of 200,431 persons
Number of Projects Implemented using LPS	-	1 project	0 projects
Area where the Master Plan is completed (km ²)	7,444km ²	8,447km ²	Total of 7,979km ²

Source: The baseline and target values are cited from the documents provided by JICA.

The actual values were created by the Evaluator based on responses from the relevant departments of the Government of Tamil Nadu.

N1: It was requested that the Government of Tamil Nadu should provide annual data for 2014-2017, but the total values at the time of ex-post evaluation were given, with the exception of "Number of trainees under TNSDM." In this table, the total "Number of trainees under TNSDM" for 2014-2016 is listed.

N2: Program completion (final disbursement): March 2016.

N3: TNSDM: Tamil Nadu Skill Development Mission

(1) Number of Projects Identified and Prioritized by TNIDB

The TNIDB is a board chaired by the Chief Minister of Tamil Nadu and composed of the secretaries of the departments in charge of infrastructure regulations. Its role is to prioritize large infrastructure projects based on how they relate to each other. It was expected that establishing this

board would accelerate project implementation, as including all the involved departments in the prioritization process would make it easier for them to coordinate with each other. According to the documents provided by JICA, eight projects were prioritized by TNIDB at the time of program implementation. At the time of ex-post evaluation, the Finance Department reported an additional 13 projects for this indicator, giving a total of 21 prioritized projects.¹⁴

(2) Number of Projects Facilitated by SIPEC

SIPEC is a board chaired by the Principal Secretary of the Finance Department of the Government of Tamil Nadu. It had the role of determining the budgets of infrastructure projects that were chosen for implementation based on investor requests in order of priority and overseeing the projects' progress to help promote their implementation.

At the time of ex-post evaluation, the Finance Department replied that 18 projects had been promoted by SIPEC. However, considering that the method of counting differs from that used in the documents provided by JICA¹⁵, the Evaluator did a recount based on the criteria mentioned in the documents provided by JICA. Moreover, the responses from the Finance Department did not include projects not promoted by SIPEC for various reasons, such as being canceled midway through the project. The role of SIPEC is only to promote project implementation and not to conduct any actual construction work, so it is appropriate to think of project promotion as SIPEC involvement regardless of whether the project in question was completed, canceled, or excluded. Thus, the Evaluator recounted the number of projects, yielding a total of 22 projects.¹⁶

(3) Number of Workshops Conducted for Attracting Foreign MSMEs

According to the Micro, Small, and Medium Enterprises Department, a Global Investors Meet (GIM) was held in Chennai, Tamil Nadu in 2015, during which two workshops were held for the purpose of attracting micro, small, and medium enterprises. Two workshops were also held at the International Engineering Fair in the Czech Republic in October 2017.

At the time of ex-post evaluation, preparations were being made to hold another GIM in Chennai in January 2019.

(4) Number of Trainees under the Tamil Nadu Skill Development Mission

The Tamil Nadu Skill Development Mission (hereinafter referred to as "TNSDM"), which was converted into Tamil Nadu Skill Development Corporation in 2013, is a non-profit organization that was established to formulate a skill development strategy for fostering skilled workers and providing basic skills training to students and unskilled workers in Tamil Nadu. Its role is to train skilled workers.

¹⁴ The 21 projects can be broken down as follows. The eight cases verified in the documents provided by JICA include fishing port development (1), tourism infrastructure development (1), waste management (2), water supply development (1), seafood processing (2), and road development (1). The thirteen cases added at the time of ex-post evaluation include waste management (2), water supply and sewerage development (1), road development (3), electric power development (1), financial service center development (1), human resource training (1), port and harbor development (2), health (1), reservoir development (1), and agriculture (1).

¹⁵ For example, one road development project over four districts was counted as four projects in the Finance Department reply.

¹⁶ The 22 projects can be broken down as follows: electric power development (6), roads (5), logistics (5), and water supply and sewerage (6).

According to a response from the Labor and Employment Department, 373,619 students and unskilled workers (trainees) participated in skills training with TNSDM involvement from FY2012-FY2016. The actual value given for the indicator in Table 4 is 200,431, which is the total for FY2014-FY2016.

(5) Number of Projects Implemented Using LPS

No legislation related to the use of LPS was enacted at the time of ex-post evaluation, and the indicator had not yet been accomplished. For details, see 3.2.1.1 Achievement Status of Policy Action, (1) LPS.

(6) Area Where the Master Plan Is Completed (km²)

The actual completed land area is 7,979 km², and the indicator target value has almost been accomplished (94%). For details, see 3.2.1.1 Achievement Status of Policy Action, (2) Master Plan/Land-use Conversion.

3.2.1.3 Qualitative Effects (Other Effects)

(1) Simplifying Investment Procedures (Situation of SWWP)

Single Window Web Portal (hereinafter referred to as "SWWP")¹⁷ was developed as a tool for gathering all applications and managing investment procedures in a single online window. In November 2017, right before the first field survey for the ex-post evaluation was conducted, the application service for large investments was launched. This service allows 37 applications for permission to be completed online at once, and an online user can check payments of application fees, the submission of related documents, replies to questions, the progress of applications,¹⁸ and which permissions have been granted. Since investors are not required to directly visit each department to submit their applications, the system is expected to make the process more convenient for investors.

The number of large investment applications made via SWWP since November 2017 is given in Table 5.

Table 5 Number of large investment applications using SWWP

Time of application	November 2017	December 2017	January 2018	February 2018
Number of applications	1	2	3	4

Source: Response from the Guidance Bureau

The plan is for SWWP to also be used for micro, small, and medium investments, but, at the time of the second field survey for the ex-post evaluation (April 2018), that service had not yet been launched. This delay is because SWWP needs to be adjusted for micro, small, and medium investment use, as it was designed for large investment use. At the time of the second field survey, it was confirmed that the security inspections for the web applications had been concluded and that the Micro, Small, and Medium Enterprises Department had obtained the approval of the Chief

¹⁷ <http://www.easybusiness.tn.gov.in> (accessed on May 7, 2018)

¹⁸ It was possible to check progress online even before the launch of SWWP, but the information was not necessarily up to-date, as it was entered manually after the Guidance Bureau received it from the relevant department.

Minister, so the services were scheduled to launch in the near future. The Guidance Bureau subsequently replied¹⁹ that service for micro, small, and medium investments began on May 4, 2018.

(2) Simplifying Investment Procedures (Implementing the Action Plan)

As noted above, some of the laws related to investment permissions in Tamil Nadu date back to the 1970s, and some investors felt it was difficult to submit applications due to language barriers, complicated procedures, customs, regulations (architectural criteria or labor regulations), and so forth. As a result, the plan was to conduct a BPR²⁰ survey under this program, but, as the Indian central government had decided to conduct a similar survey, the BPR survey was to be conducted with reference to the central government’s survey. However, the central government survey was delayed, which prompted the Guidance Bureau to create an action plan after reviewing past investment-related surveys. This plan was presented to JICA, the Japan External Trade Organization (JETRO), and the Japanese Chamber of Commerce & Industry, Chennai in February 2015. The progress of the action plan at the time of ex-post evaluation was checked, and the department in charge, the Industries Department of Tamil Nadu, replied that the action plan had been replaced by a plan for the reform areas described in the Business Reforms Action Plan (hereinafter referred to as “BRAP”) of the Department of Industrial Policy and Promotion, Ministry of Commerce and Industry (hereinafter referred to as “DIPP”) of the Indian central government. BRAP is a system for ranking states according to their progress simplifying and rationalizing business-related regulations in accordance with the areas suggested for each state by DIPP. Tamil Nadu ranked 18th with a score of 62.80% in FY2016 and 15th with a score of 95.93% in FY2017.²¹ According to the Industries Department, states are motivated to promote reforms, as they fear their rankings may fall if they have low accomplishment rates. Tamil Nadu’s progress with BRAP can be seen in the below-mentioned Table.

Table 6 Tamil Nadu’s Progress with BRAP²²

Item	FY2015	FY2016	FY2017
Number of Reform Areas	285	340	372
Complete	202	211	353
Incomplete	62	125	16
Exceptions ^{N1}	21	4	3

Source: Response from the Industries Department

N1: Exceptions signify the reform areas that were not thought suitable for Tamil Nadu based on their contents.

¹⁹ The Guidance Bureau was in charge of adjusting SWWP for micro, small, and medium investment use.

²⁰ Such a survey involves a comprehensive review of investment application processes as well as related regulations and their administration.

²¹ <http://www.eodb.dipp.gov.in/index.aspx> (accessed on May 24, 2018)

²² The number of reform areas that were completed according to the Industries Department is based on a self-evaluation. Thus, it does not necessarily match the results announced by DIPP.

(3) Improving the Effectiveness of Administrative Work Related to Investments

The Guidance Bureau indicated that they previously had received many visits from investors wanting to make applications or gather information, and personnel and time had to be devoted to these visits. The Guidance Bureau's staffing level has not changed since the start of SWWP, but they say that visits from investors have become less frequent, and the burden of assisting investors has been reduced.²³

As for the Micro, Small, and Medium Enterprises Department, as discussed above, SWWP was not in use for micro, small, and medium investments at the time of the second field survey for the ex-post evaluation, so any concrete improvements have not been confirmed in effectiveness.

(4) Enhancing the Ability to Coordinate Infrastructure Projects

TNIDB has prioritized 21 projects (total value), whereas the target value for the operation indicator related to the number of prioritized projects is ten. Moreover, TNIDB provides immediate assistance, such as, for example, by guiding the organizations implementing infrastructure projects by applying laws such as the *Tamil Nadu Infrastructure Development Act 2012*, the *TNID Rules 2012*, the *TNID Regulations 2013*, the *Tamil Nadu Transparency in Tenders (PPP Procurement) Rules 2012*, and the *Tender Act 1998*. TNIDB also provides opportunities for solving issues related to the promotion of projects by organizing meetings between the organizations implementing the projects, consultants, and other relevant parties. TNIDB has already identified 217 projects, including the 21 prioritized projects, as candidates for implementation, thus demonstrating the effectiveness of its project coordination ability. These 217 projects have been announced as *Vision Tamil Nadu 2023 PHASE 2, Project Profiles*,²⁴ which shows that they are trying to share information with investors.

3.2.2 Impacts

3.2.2.1 Intended Impacts

(1) Quantitative Effects Related to Improving the Investment Environment (Impact 1 [Short Term])

Table 7 Effect Indicators

Indicator	Baseline	Target	Actual
	FY2012	FY2014	FY2017
		Completion Year	1 Year After Completion
Number of MSMEs applied through a new single window system	-	40	0

NI: Program completion (final disbursement): March 2016.

As described in section 3.2.1.3 Qualitative Effects (Other Effects), (1) Simplifying Investment Procedures (Situation of SWWP), SWWP for micro, small, and medium investments had not yet been launched at the time of the second field survey for the ex-post evaluation (April 2018). As such, the number of micro, small, and medium enterprises that had used the service at the time of ex-post evaluation was zero, and it is not yet confirmed that this program is having an impact in terms of improving the investment environment. However, since the service began in May 2018, it

²³ This conclusion comes from information from the Guidance Bureau's Company Secretary.

²⁴ http://www.investingintamilnadu.com/doc/Tamil_Nadu_VISION_2023_Phase_2.pdf (accessed on January 16, 2018)

has become possible also for investors thinking about making micro, small, or medium investments to submit applications, check statuses, pay fees, check permissions, and so forth in a single online window. Thus, it can be expected that the process will become more convenient not only for micro, small, and medium enterprises but also for any investor thinking about opening a sales base in Tamil Nadu or otherwise expanding there in a form that does not require a large investment.²⁵

(2) Qualitative Effects Related to Improving the Investment Environment (Impact 1 [Short Term])

Investors' Relative Satisfaction with the Functions of the Guidance Bureau

Prior to the start of SWWP in November 2017, a single contact point was provided by the Guidance Bureau, but investors nonetheless made large investment applications by printing the required documents and directly visiting the relevant departments. As a result, investors had to make a certain amount of effort to complete the application procedure. However, among the 16 companies²⁶ that the Evaluator interviewed, none expressed any specific dissatisfaction with the single window system functions, instead responding that there were no particular problems with these functions. The investors who responded to the questionnaire mostly responded that they obtained permission one to two and a half months after applying. Some cases of delays were caused by land issues, permissions related to environmental impact evaluations and anti-pollution measures, and construction permissions, but, even then, the investors responded that they had received the full support of the Guidance Bureau. All in all, it is judged that investors are satisfied with the functions of the Guidance Bureau.

Promoting Economic Development in the Chennai Metropolitan Area

Developments in GDP data for Tamil Nadu and the Chennai metropolitan area can be seen in below-mentioned Table.

Table 8 Developments in GDP Data (million rupees)

Economic Area	FY2007	FY2008	FY2009	FY2010
Tamil Nadu	3,508,190	4,013,360	4,797,330	5,848,960
Chennai Metropolitan area	249,440	283,320	315,980	372,790

Economic Area	FY2011	FY2012	FY2013	FY2014
Tamil Nadu	7,514,850	8,554,800	9,710,890	10,925,630
Chennai Metropolitan Area	415,060	N/A	N/A	N/A

Economic Area	FY2015	FY2016		
Tamil Nadu	12,126,670	13,387,660		
Chennai Metropolitan Area	N/A	N/A		

Source: Response from the Finance Department

Note: The Economic Statistics Department has not published any related data for the Chennai metropolitan area for 2012 onward.

²⁵ An investment is classified as micro, small, medium, or large based on the sum invested and not the size of the investor's company. Refer to footnotes 9 and 10 as well.

²⁶ The Evaluator conducted interviews with investors at seven companies during the first field survey for the ex-post evaluation. Via the Guidance Bureau, questionnaires were sent to 75 companies that had used the single window service in 2011 or later and received responses from nine of them.

It is impossible to judge the extent to which this program has directly contributed to the economic development of Tamil Nadu and the Chennai metropolitan area, but the data show that Tamil Nadu is consistently achieving economic growth. It was unable to obtain data for the Chennai metropolitan area after FY2011, but considering that it makes up 6-7% of Tamil Nadu's GDP, it can be concluded that the metropolitan area has also been experiencing annual growth together with the parameter (Tamil Nadu's GDP) in 2012 and beyond.

Impact on the Departments in Charge of Policy Actions and on Firms Expanding into the Area

As shown in section 3.2.1.3 Qualitative Effects (Other Effects), (3) Improving the Effectiveness of Administrative Work Related to Investments, the Guidance Bureau has experienced a reduced burden in terms of staff allocation and time since the start of SWWP. The Finance Department also says that they have created a framework for examining policy actions across relevant departments and are now able to examine these actions with an awareness of their deadlines. Interviews with other departments did not reveal any particular changes.

With the implementation of small infrastructure projects, some cases have been observed in which investors can maintain stable operations due to the completion of roads to Ennore Port (see box) and in which investors can continue operations due to a stable supply of electric power. It appears that these projects are having a certain impact on investor convenience.

Example of Benefits Created by This Program

A certain Japanese manufacturing firm issued a memorandum together with the Government of Tamil Nadu in 2009 on the decision to construct a factory in the state. The products manufactured by the firm included deadweight cargo, whose smallest transportation unit is 700 tons, so the roads and bridges between the planned factory site and Ennore Port needed to be developed. The Government of Tamil Nadu promised this development in the memorandum but had trouble realizing it due to budgetary restrictions and other issues. When the provision of this program was decided in November 2013, Tamil Nadu decided to include improvements to the roads and bridges leading to Ennore Port in the infrastructure development category in the policy matrix. The construction work was managed by the Tamil Nadu Road Development Corporation Limited (TNRDC), and progress was monitored by the company as well as by JICA experts. In January 2016, the development of the roads and bridges was completed. In March 2016, the firm made the first shipment of its finished products. At the time of ex-post evaluation, the firm had dispatched deadweight cargo a total of five times, demonstrating that this program has benefitted the stable operations of investors.



Cargo in transit (it is standing by the roadside, waiting for completion of preparation work before crossing the railroad) (TNRDC photo)

Improving the Urban Environment by Enhancing the Comfort of Road Transportation and Alleviating Traffic Congestion
Increasing Convenience for Firms Expanding into the Area by Ensuring the Timeliness of Transportation

The roads and bridges (the roads leading to Ennore Port described in the box above) developed as part of small infrastructure projects were widened and made more durable to facilitate the transportation of deadweight cargo. The Evaluator actually drove on the roads and bridges and judged that, at the time of ex-post evaluation, they were sufficiently wide without local bottlenecks, although, in some instances, the trucks carrying ocean containers were lined up along the road awaiting loading or unloading. There were also no particular impediments to driving in cruising lanes. Furthermore, the roads had been maintained in a suitable state. As far as the Evaluator could see, the development of roads to Ennore Port has enhanced road transportation comfort and has made congestion more avoidable through a small amount of planning.

The Impact of Water Supply and Sewerage Development and Electric Power Projects

Initially, six projects related to water supply and sewerage development were among the planned small infrastructure projects promoted by this program, but two were excluded, and the remaining four were still in progress at the time of ex-post evaluation. As such, it was impossible to confirm the program's impact with regard to water supply and sewerage. Even so, although Tamil Nadu suffered from a water shortage at the time of appraisal, water shortage, serious enough to impede factory operations, was not confirmed at the time of ex-post evaluation. Investor responses in the interviews and to the questionnaires suggested that, although investors are not necessarily satisfied with the water supply, they are currently maintaining stable operations by purchasing water from private water companies and having it delivered by tank trucks.

With regard to electric power, six infrastructure projects were initially planned. At the time of ex-post evaluation, five were completed and one was canceled. According to the Finance Department, the power shortage was resolved by adding solar power, wind power, and nuclear power to the conventional thermal power. It has also been reported in newspapers that the "electric power supply is expected to exceed demand in the next four years, removing the need for planned power outages until 2021."²⁷ Investor responses in the interviews and to the questionnaires did not suggest any issues caused by power shortages. As such, it seems that the electric power situation in Tamil Nadu has improved and that this program has had a certain impact.

(3) Increasing Interest among Foreign Investors (Impact 2 [Medium Term])

The Guidance Bureau, which is in charge of large investments, does not have any data on the number of inquiries they receive and such information was not available. The contents of inquiries mainly include questions about applying through the single window service that existed before SWWP, whether investments may receive preferential treatment, handling complaints, applying for preferential treatment, and whether suitable land is available. In place of data on the number of

²⁷ *The International Business Times* on June 9, 2016 and *the Times of India* on June 7, 2016.

inquiries, data on the number of applications using the single window service were provided by the Guidance Bureau.

Table 9 Number of Applications from Foreign Investors Using the Single Window Service

FY	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	FY2017
Number of Applications	17	7	7	9	12	7	6

Source: Response from the Guidance Bureau

The following response were provided by the Micro, Small, and Medium Enterprises Department, which is in charge of micro, small, and medium investments.

Table 10 Number of Inquiries about Micro, Small, and Medium Investments

FY	FY2013	FY2014	FY2015	FY2016	FY2017
Number of Inquiries	12	15	20	17	19

Source: Response from the Micro, Small, and Medium Enterprises Department

Having analyzed the data from the Guidance Bureau and the Micro, Small, and Medium Enterprises Department, a striking increase in interest from foreign investors is not observed, so it appears to be too early to confirm the intended Impact 2 [Medium Term].²⁸

(4) Increasing Foreign Direct Investment (Impact 3 [Long Term])

Table 11 shows annual data for foreign direct investment into all of India and the State of Tamil Nadu before, during, and after the program implementation. These values are influenced by numerous external factors that do not depend on a state's investment environment, such as more investments in India as a whole or in other states. Considering that the impact is a long-term effect, it was difficult at the time of ex-post evaluation to verify the positive or negative changes due to this program with regard to increases in foreign direct investment.²⁹

Table 11 Foreign Direct Investment (million US dollars)

Area	FY2008	FY2009	FY2010	FY2011	FY2012
All of India	27,331	25,834	21,383	35,121	22,424
Tamil Nadu	1,724	774	1,352	1,422	2,807
Proportion	6%	3%	6%	4%	13%

Area	FY2013	FY2014	FY2015	FY2016	FY2017
All of India	24,299	30,931	40,001	43,478	10,408
Tamil Nadu	2,116	3,818	4,528	2,218	996
Proportion	9%	12%	11%	5%	10%

Source: Response from the Finance Department; proportions were calculated and added by the Evaluator

Note: The FY2017 data is for April-June, 2017

3.2.2.2 Other Positive and Negative Impacts

(1) Impact on the Natural Environment

The policy actions of this program are limited to those that do not affect the natural and social

²⁸ As discussed in section 2.3.1 Program Objective, Impact 2 (Medium Term) is not used in this evaluation.

²⁹ As discussed in section 2.3.1 Program Objective, Impact 3 (Long Term) is not used in this evaluation.

environments. Even so, by promoting the policy action related to the policy (task) “Infrastructure Project Coordination and Prioritization,” the Government of Tamil Nadu commenced to conduct small infrastructure projects with its own funds. After interviews with the entities in charge of the projects (e.g., Tamil Nadu Transmission Corporation Limited, Tamil Nadu Road Development Corporation Limited, Chennai Metropolitan Development Authority, Municipal Administration and Water Supply Department, etc.), no particular negative impact on the natural or social environments were observed.

(2) Resettlement and Land Acquisition

During an interview with the Tamil Nadu Road Development Corporation Limited, it has been confirmed that in the case of one road project among the small infrastructure projects (22 in total), 22 households were relocated and 11,770 km² of land were acquired. Compensation was paid out in accordance with the laws of Tamil Nadu,³⁰ and no particular problems appear to have arisen.³¹

With regard to effectiveness, this policy action has largely been accomplished. As a result, among the operation indicators, although the number of projects implemented using LPS has not yet reached the target, the number of projects identified and prioritized by TNIDB, the number of projects facilitated by SIPEC, the number of workshops conducted for attracting foreign MSMEs, and the number of trainees under TNSDM have all exceeded the target values, suggesting that the program is progressing smoothly. Furthermore, the Master Plan has been completed in 94% of the target value, and the numeric target has almost been reached. It was impossible to confirm any other concrete effects for the simplification of investment procedures and the improvement of the effectiveness of administrative work since the SWWP for large investments started as recently as November 2017 and the SWWP for micro, small, and medium investments started in May 2018. However, it was confirmed that investors were not particularly dissatisfied with the single window service that existed prior to SWWP. With the start of SWWP and the reduction in the application burden that comes with the convenience of online services, investors’ satisfaction will be very much expected to increase. As discussed above, a greater ability to coordinate infrastructure projects is confirmed. As such, effectiveness appears high.

In terms of impacts, the target number of micro, small, and medium enterprises using the new single window service has not yet reached, but since SWWP has now been launched at full scale, convenience will be expected to increase for investors of all sizes (micro, small, medium, and large) if the service continues to run well. Moreover, although the extent of this program’s contributions

³⁰ In Tamil Nadu, the *Right to Fair Compensation and Transparency in Land Acquisition Rehabilitation and Resettlement Act* was adopted in 2014, and enforcement regulations for the law came into effect in September 2017. Before this law, compensation was provided according to the *Tamil Nadu Acquisition of Land for Industrial Purposes Act, 1997*, the *Tamil Nadu Highways Act, 2001*, and the *Tamil Nadu Acquisition of Land Harijan Welfare Schemes Act, 1978* (the Harijan are the people perceived as belonging to the lowest social class). Between when the law was adopted in 2014 and when the enforcement regulations came into effect in September 2017, compensation was paid out provisionally using the same sums as before, but departments were instructed to pay out compensation in accordance with the 2014 law starting in November 2017, and it is expected that corrections will be made.

³¹ For one logistics project, residents filed a lawsuit in connection with the land acquisition, in response to which the project was excluded from SIPEC promotion. This instance was reported by the experts of Technical Assistance related to Japanese ODA Loan in 2014.

is unknown, the economic development (GDP base) of Tamil Nadu and the Chennai metropolitan area is also confirmed. Some cases are also confirmed in which the small infrastructure projects facilitated by SIPEC helped investors continue running their businesses. As such, it would seem that the impacts are fair.

This program has largely achieved its objectives. Therefore, the effectiveness and impacts of the program are high.

3.3 Sustainability

3.3.1 Institutional / Organizational Aspect of Operation and Maintenance

The Executing Agency of this program is Finance Department of the Government of Tamil Nadu. The policy actions are pursued by the state government’s departments, and progress is monitored by the Program Monitoring Committee (hereinafter referred to as “PMC”). The committee is composed as show in Table 12.

Table 12 The PMC Composition for This Program

Role	Name
PMC Head	Finance Department Principal Secretary
Members	Industries Department; Information Technology Department; Micro, Small, and Medium Enterprises Department; Labor and Employment Department; Highways and Minor Ports Department; ³² Housing and Urban Development Department

Source: The documents provided by JICA

TNIPP Phase 2, which is a continuation of this program, was set up in March 2017, after which a government order issued in June 2017 confirmed the composition and roles of the PMC. The system was implemented as shown in the below-mentioned Table.

Table 13 The PMC Composition for TNIPP Phase 2

Role	Name
PMC Head	Finance Department Additional Chief Secretary
Members	Industries Department; Highways and Minor Ports Department; Micro, Small, and Medium Enterprises Department; Labor and Employment Department; Municipal Administration and Water Supply Department; Energy Department; Animal Husbandry, Dairying, and Fisheries Department; Planning, Development, and Special Initiatives Department; Information Technology Department; Tourism, Culture, and Religious Endowments Department; School Education Department

Source: Response from the Finance Department

As is the case for this program, JICA participates in the PMC for TNIPP Phase 2 and monitors the program’s progress. The departments of the state government implementing the program all remain as PMC members in charge of policy actions for TNIPP Phase 2 with the exception of the Housing and Urban Development Department. This composition suggests that a continuous

³² This department participated as the department in charge of LPS. This policy was handled by the Housing and Urban Development Department starting in October 2013, but jurisdiction changed to the Land Commission, Revenue Department in September 2016.

framework for improving the investment environment has been created and that a sustained effect of the program can be expected.

3.3.2 Financial Aspect of Operation and Maintenance

The budgetary situation of the Government of Tamil Nadu is as shown in Table 2. Each department covers personnel and office expenses for its administrative activities with the state budget supplied via the Finance Department.³³ The personnel and office expenses for the staff involved in the implementation of policy actions are included in these expenses, and although deficits are common, the departments have sufficient funds to perform day-to-day work, it is highly possible to expect that the policies for promoting investments will continue in TNIPP Phase 2.

Given this background, any particular problems in terms of financial sustainability are not seen.

3.4 Added Value of JICA

JICA dispatched the experts of Technical Assistance related to Japanese ODA Loan for the implementation of this program and sought to promote its implementation to help the Government of Tamil Nadu run the program smoothly. The state government was able to cover information gaps in the practical work with the help of the experts dispatched by JICA and could grasp industry requests as appropriate, which, along with the benefits of the effective discussions of the PMC, explains their positive evaluation of the experts dispatched by JICA. Moreover, the Labor and Employment Department praised the role of the experts of Technical Assistance related to Japanese ODA Loan, who were dispatched primarily to conduct trainings in the areas of welding and machine processing to develop industry human resources. If a skills strengthening program was provided for lecturer-level skilled workers, then the department could expect further human resource development. In this way, JICA provides effective support by combining two support tools, ODA Loan and Technical Assistance related to Japanese ODA Loan, and displays its strengths as the organization comprehensively in charge of implementing the Japan's ODA.

4. Conclusion, Lessons Learned, and Recommendations

4.1 Conclusion

The objective of this program is to attempt to streamline the investment climate in Tamil Nadu in southern India through encouraging the improvement of the policy and institutional framework to promote the investment as well as the early implementation of projects enhancing the quality of urban infrastructure mainly of roads, electric power, water supply and sewerage and other infrastructure facilities, thereby contributing improvements to the state's investment environment.

This program complies with the development policies and needs of India and Tamil Nadu as well as with Japan's ODA policy. This program is also suitable in terms of its program planning and approach. Therefore, its relevance is high. Moreover, the target quantitative effects

³³ The Finance Department explained that the state budget is prepared by the Finance Department and that funds are allocated to the various departments to cover expenses, so that the state budget shown in Table 2 is that of the Finance Department, representing all the departments.

have largely been achieved as a result of this program, and the program appears to be proceeding steadily. Furthermore, in terms of qualitative effects, economic development in Tamil Nadu as well as contribution to continued investor involvement by the small infrastructure projects facilitated as part of this program have been observed. Therefore, the effectiveness and impacts are high. Nevertheless, continued monitoring of future applications on the Single Window Web Portal is necessary since this ex-post evaluation was conducted right after its launch. Regarding the sustainability of the initiatives to improve the investment environment, the composition of organization and roles of the related institutions involved in the Tamil Nadu Investment Promotion Program (Phase 2), which is a continuation of this program, is verified. Moreover, from a financial perspective, its sustainability can be deemed to be guaranteed, as sufficient funds have been allocated to the relevant departments by the state government for policy and institutional reform and for infrastructure development.

4.2 Recommendations

4.2.1 Recommendations for the Executing Agency

4.2.1.1 Monitoring the Use of SWWP

At the time of the first field survey for the ex-post evaluation in November 2017, the SWWP service for large investments had just been launched. At the time of the second field survey for the ex-post evaluation in April 2018, the SWWP service for micro, small, and medium investments had not yet been launched (it was confirmed that it was launched on May 4, 2018). As such, the performance and effects of the service have not yet been confirmed. From here on, it would be best to jointly monitor the service with Japan by, for example, asking the PMC for TNIPP Phase 2 report on the performance of SWWP.

4.2.1.2 LPS and Master Plan/Land-use Conversion

Some of the policy tasks related to LPS and Master Plan/Land-use Conversion are yet to be accomplished. It is confirmed in the survey that efforts continue to be made to accomplish these tasks, but they are not included in the policy matrix for TNIPP Phase 2. Thus, to continue to monitor the progress of the policy actions related to LPS and Mater plan/Land-use Conversion, it would be best if a target deadline was set and the progress monitored jointly with Japan by, for example, making reports until completion when the PMC for TNIPP Phase 2 convenes.

4.2.2 Recommendations to JICA

None.

4.3 Lessons Learned

Dialogue with the Private Sector

When implementing this program, JICA based its approach on the results of the ex-post

evaluation of the *Development Policy Assistance Program (II) (III)* in the Philippines,³⁴ which was a similar project, by dispatching experts in 2012, consulting with the Japan Chamber of Commerce & Industry, Chennai and firms expanding in the area, revealing policies and infrastructure projects for promoting foreign direct investment in Tamil Nadu, and compiling a basic scheme for promoting investment in Tamil Nadu. As a result, JICA could reliably reflect the requests of the private sector in the program.

In this way, improvements to the investment environment facilitate profits for investors, which increases the attractiveness of the area of investment (in this case, Tamil Nadu), attracts even more investment, and leads to profits for the area of investment. As such, when it comes to Development Policy Lending for improving the investment environment, it is best to convey and share information with the private sector in the planning stage, exchange opinions with the private sector, and reflect investor requests in the policy matrix before the program is implemented.

Bilateral Policy Dialogue Based on JICA Independent Financing

This program is not co-financed, and it does not share a policy matrix with international organizations or other donors, but it was conducted following a bilateral policy dialogue between JICA and the Government of Tamil Nadu, and JICA provided independent financing once the policy matrix was formulated. The Government of Tamil Nadu expressed that the bilateral policy dialogue on the basis of JICA independent financing allowed them to frankly discuss what was and was not possible to formulate a realistic policy matrix and to make sure that the policy matrix sufficiently reflected the issues of Tamil Nadu. In this way, they evaluated the framework of bilateral policy dialogue based on JICA independent financing highly. Furthermore, the policy matrix also reflects the needs and wishes of firms expanding into the area, including Japanese, so it is a framework that benefits Japan as well. It includes a certain number of conditions, such as frank discussions between the policy dialogue parties and that the parties remain realistic without excessive expectations or unreasonable requests, but a bilateral policy dialogue based on JICA independent financing is an effective framework that is supposed to assist Japanese firms in expanding abroad using ODA.

³⁴ FY2011 ex-post evaluation.