Republic of India

FY2023 Ex-Post Evaluation Report of
Japanese ODA Loan Project
"Tamil Nadu Biodiversity Conservation and Greening Project"

External Evaluator: Yumiko Onishi, IC Net Limited

0. Summary

This project was implemented in Tamil Nadu in southern India, with the objective to conserve biodiversity by strengthening the management of protected areas, planting trees outside of forest areas, improving livelihoods, and enhancing the operational capacity of the forest department thereby contributing to environmental conservation and harmonized socio-economic development. The project is evaluated very high on relevance and coherence, efficiency, effectiveness and impact, and sustainability.

Regarding the relevance and coherence, the project was aligned with the policies and development needs of both the Indian and Tamil Nadu governments from the time of project appraisal to that of the ex-post evaluation. It addressed various development needs identified during the appraisal and contributed to resolving them. The project's design and implementation were adjusted to create synergies with previous and subsequent projects from the project planning stage, which is highly commendable. Owing to its collaboration with other government schemes and organizations, the project has prompted the formulation and issuance of multiple new policies, schemes, and government directives in the country. Regarding efficiency, the project was implemented largely as planned, except for a few deletions or modifications of its scope, and both the project cost and duration remained within the original plan. Effectiveness and impact generally achieved the quantitative targets, while several unexpected impacts were identified. Notably, the executing agency's focus on building mutual trust with local community organizations is a key lesson from the project. Sustainability is also ensured, with organizational structure, technical capacity, and budget in place for continuing similar activities in the future. No significant risks that could undermine the project effects were identified.

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

1. Project Description

Project location

Releasing hatched sea turtles (Photo by the external evaluator)

1.1 Background

Tamil Nadu is home to the Western Ghats mountain range and is one of the states in India with rich biodiversity. The state has 41 protected areas[1] and 553 species of endemic flora and fauna, with approximately one-third of the seed plant species found in India. The state also has diverse wild animals including 187 species of mammals, 177 reptiles, 76 amphibians, and 454 birds. In addition to tigers and elephants, endangered species such as the Nilgiri Tahr, an endemic ungulate, also have their habitat in the state. However, during the appraisal of the project in 2011, 230 species faced the threat of extinction due to habitat loss and degradation, the expansion of invasive alien species, wildfires, and poaching. Moreover, the reduction of habitats in the protected areas led to wildlife, such as tigers and elephants, encroaching on human settlements, resulting in numerous reports of human-wildlife conflict.

In 2008, the forest cover in Tamil Nadu was 21.8%,[2] falling short of the national goal of 33% set by India's *National Forest Policy* (revised in 1988). This highlighted the need for accelerated efforts to improve the forest cover. Moreover, in recent years, the demand for timber as a construction material and fuel has increased owing to rapid population growth. However, the state's timber supply capacity was not keeping pace, causing 31% of the necessary timber to be imported from outside the state or country in 2008.[3] On the other hand, there is a significant amount of fallow land outside the forests owned by people such as farmers (comprising 18% of the land area in the state). By implementing afforestation activities on the fallow land, it was anticipated that forest cover could be improved while increasing timber production.

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[1] Tamil Nadu Biodiversity Board. (https://tnbb.tn.gov.in/tn-wild.php#:~:text=The%20Protected%20Areas%20in%20the,(Protection)%20Act%2C%201972.) Accessed on August 27, 2024.

[2] Materials provided by JICA.

[3] Materials provided by JICA.

1.2 Project Outline

The objective of this project is to strengthen biodiversity conservation by improving ecosystem and the management capacity as well as undertaking tree planting outside the recorded forest areas, thereby contributing to environmental conservation and harmonized socio-economic development of Tamil Nadu.

<ODA Loan Project>

Loan Approved Amount / Disbursed Amount	8,829 million yen / 7,878 million yen	
Exchange of Notes Date / Loan Agreement Signing Date	February 2011 / February 2011	
Terms and Conditions	Interest Rate	0.65%
	Repayment Period (Grace Period	40 years 10 years)
	Conditions for Procurement	General untied
Borrower / Executing Agency	The President of India / Tamil Nadu Forest Department	
Project Completion	March 2019	
Target Area	Tamil Nadu State in southern India	
Main Contractor(s) (Over 1 billion yen)	-	
Main Consultant(s) (Over 100 million yen)	-	
Related Studies (Feasibility Studies, etc.)	The preparatory survey on Tamil Nadu Biodiversity Conservation and Greening Project (September 2010)	
Related Projects	<Japanese ODA loan> Tamil Nadu Afforestation Project (February 1997) Tamil Nadu Afforestation Project II (March 2005) Tamil Nadu Biodiversity Conservation and Greening Project for Climate Change Response (March 2022)	

	<Technical cooperation> Project for Capacity Building of State Forest Training Institute and Central Academy for State Forest Service (2009–2014) <Other agencies> World Bank: Biodiversity Conservation and Rural Livelihood Improvement Project (2011–2018) Global Environment Facility: Conservation and Sustainable Use of the Gulf of Mannar Biosphere Reserve's Coastal Biodiversity (1998–2008)

2. Outline of the Evaluation Study

2.1 External Evaluator

Yumiko Onishi, IC Net Limited

2.2 Duration of Evaluation Study

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

Duration of the Study: December 2023–February 2025

Duration of the Field Study: February 20–March 12 and July 1–18, 2024

3. Results of the Evaluation (Overall Rating: A[4])

3.1 Relevance/Coherence (Rating: ④[5])

3.1.1. Relevance (Rating: ④)

3.1.1.1 Consistency with the Development Plan of India

From the time of the appraisal to that of the ex-post evaluation of the project, forest regeneration and biodiversity conservation have been one of the key national targets set by the Government of India. During the appraisal of the project, the national five-year plan (*Eleventh Five-Year Plan* from April 2007 to March 2012) focused on the restoration of degraded forests, promoting activities related to joint forest management and management on wildlife sanctuaries, and reducing human-wildlife conflict. In recent years, the importance of biodiversity conservation and climate change measures increased significantly, leading to the introduction of several related policies and programs including the *National Wildlife Action Plan* (2017‐2031) in 2017.

The Tamil Nadu government is actively engaged in developing concrete plans and initiatives for habitat improvement and climate change mitigation, establishing its position as a model in the country. In its *State Forest Policy 2018*, the state government identifies climate change mitigation

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

[5] ④: Very High, ③: High, ②: Moderately Low, ①: Low

through resilient and sustainable forests as one of its top priorities, committing itself to strengthening the state forest department's capacity to achieve this. Furthermore, the *State Climate Change Action Plan Draft 2.0* (2019) outlines measures for climate change adaptation, including increasing forest cover, enhancing biodiversity conservation, and improving the livelihoods of communities dependent on forest resources, along with building capacity related to climate change.

The state government established the *Tamil Nadu Policy on Invasive Alien Species and Ecological Restoration of Habitats* (2022) to continue and promote similar activities, recognizing that the removal of invasive alien species through the project is effective for biodiversity conservation. Moreover, it launched the *Green Tamil Nadu Mission*, a program focused on climate change mitigation. Furthermore, the sea turtle conservation activities initiated by the project led to significant measures, such as a fishing ban within five nautical miles of the coastline during the nesting season (2015) and a government order to turn off resort lights at night to prevent hatchling sea turtles from being misled by artificial light (2018).

Thus, forest regeneration, biodiversity, and climate change remain key focus areas for both the Indian and Tamil Nadu governments, confirming the consistency with the project aiming for biodiversity conservation. The way in which the project raised awareness on the importance of biodiversity conservation is particularly noteworthy, leading to the development of several new policies, schemes, and government orders. This aspect is highly commendable and offers valuable insights for other projects.

3.1.1.2 Consistency with the Development Needs of India

As described in "1.1 Background," Tamil Nadu possesses diverse ecosystems; however, its biodiversity has been threatened by factors such as invasive alien species, wildfires, and poaching. The Tamil Nadu Forest Department (TNFD) developed management plans for protected areas considering their unique characteristics, and the plans outline strategies to address various factors adversely impacting biodiversity. However, the budget for biodiversity conservation was not particularly sufficient, and strengthening effective and efficient management of protected areas required enhanced capacity through the acquisition of more specialized knowledge. Moreover, to conserve the biodiversity surrounding forest areas, it was essential to provide local communities with sustainable livelihoods and means of living in harmony with the natural environment such as ecotourism. This approach aimed to reduce impacts on ecosystems and promote sustainable forest management.

The project contributed to addressing various development challenges. However, many of these challenges require continued effort. Table 1 summarizes the status of responses to development needs at the time of the ex-post evaluation.

Table 1: Development Needs at the Time of the Appraisal and Response Status

Development needs identified at the time of the project appraisal	Current status and action taken by the project
Increase in forest cover: In 2008, the forest cover in Tamil Nadu was 21.8%. To meet the national target of 33%, afforestation outside forest areas was necessary.	Over the past decade, the green cover in Tamil Nadu expanded by 2,794 km²; however, the forest cover remains at 20%, indicating that further tree planting is necessary to meet the national target. Given the limited forest area in the state, it is essential to further expand the tree cultivation on private land (TCPL) initiatives implemented by the project. Details on achievement of TCPL are discussed in the Efficiency and Effectiveness sections.
Removal of invasive alien species: The habitat of invasive alien species (such as wattle and mesquite, which are not native to Tamil Nadu) has expanded, threatening the native species habitat.	Although invasive plants have been removed from 3,000 ha of land, these species have strong regenerative capabilities, necessitating continued efforts of removing them (maintenance activities). According to the TNFD, restoring the state's plant ecosystem is estimated to take 20 years. The department further estimates that removal of invasive alien species is still required on 318,000 ha, indicating that the target area must be gradually expanded. In the Tamil Nadu Biodiversity Conservation and Greening Project for Climate Change Response, which is Phase 2 of the project, there are plans to develop standard operating procedures for removing invasive alien species.
Protection of marine ecosystems: The presence of endangered species such as dugongs and sea turtles required the promotion of conservation activities.	Conservation activities for sea turtles and dugongs have been implemented, establishing a foundation for marine ecosystem protection. These efforts have been pilot initiatives, and it is necessary to expand the scale of these activities through Phase 2 of the project and other government programs.
Mitigation of human-wildlife conflict: Owing to habitat loss, tigers and elephants frequently appeared in human settlements, increasing the reports of conflict-related incidents.	To mitigate human-wildlife conflict, various measures have been implemented through the project. Meanwhile, animals such as elephants are highly adaptable and may learn to circumvent the strategies introduced by the project in the future. Therefore, adaptive management[6] is essential for effective wildlife conservation.
Strengthening management plans for protected areas: The development of management plans based on specialized knowledge has been essential for efficient and effective management of protected areas.	Management plans for protected areas were developed based on scientific evidence. Through the implementation of the project, TNFD staff gained knowledge and experience in preparing management plans. These plans are updated every five years.
Promotion of ecotourism: The promotion of ecotourism was expected to provide local communities around forests and protected areas with livelihoods and means to live in	Ecotourism is being operated and managed by the community organizations at 25 target sites. This initiative aims to help local people understand the value of the natural environment while providing them with livelihood opportunities. In the state, there is a plan to develop an ecotourism circuit connecting the sites developed through

[6] Management methods used for the conservation of wildlife and ecosystems. It means adapting management methods according to the results in an environment that is constantly changing and characterized by uncertainty.

harmony with the natural environment, thereby reducing adverse impacts on natural ecosystems.	the project to attract visitors.

As stated above, there has been a continuous need for biodiversity conservation and forest expansion from the time of the project appraisal to the ex-post evaluation, indicating that the project is consistent with the development needs of India and Tamil Nadu.

3.1.1.3 Appropriateness of the Project Plan and Approach

The project clearly focused on biodiversity conservation, as indicated in its name. Through interviews with the TNFD, it was found that all aspects of the project design were meticulously considered to contribute ultimately to biodiversity conservation. Various approaches were examined, referring to existing research findings and best practices regarding the removal of invasive alien species and mitigation of human-wildlife conflict. Moreover, given the project budget and timeline, the project plan and scope were made in such a way as to maximize impact with the available resources.

In place of limited forest areas for increasing the forest cover, the project implemented tree cultivation on private land (TCPL), which was a first for the forest projects funded by Japanese ODA loans in India. Before the project commenced, TNFD had a two-year pilot period funded by the state government to explore the design of this component.

While the primary beneficiaries of the project were the local communities around protected areas, they included many Scheduled Tribes who are particularly vulnerable to being left behind. Therefore, when formulating the project, careful consideration was given to their opportunity to participate in the project, needs, and equitable economic benefits. The project was designed with attention to the needs and economic benefits of the beneficiaries, including measures to mitigate human-wildlife conflict and ecotourism management. At the time of the project appraisal, discussions were held with local communities to explain the project objectives and confirm local development needs. Of local community organizations created in earlier projects (TAP I and II),[7] close attention was paid to extend assistance to Scheduled Tribes and other communities who had not received development assistance from other government agencies. As a result of this careful attention, it is fair to say that the project effects were equitably delivered to the vulnerable populations as well.

Regarding the implementation arrangements, changes were made from TAP I and II, establishing a Project Management Unit (PMU) rather than the project being directly managed by the TNFD.[8] The PMU was established under the TNFD but matters related to routine activities

[7] TAP I: Tamil Nadu Afforestation Project (February 1997‐May 2005); TAP II: Tamil Nadu Afforestation Project II (March 2005–March 2013). Both were implemented by Japanese ODA loans.

[8] The advantage of introducing the PMU is explained in "3.2.1. Project Outputs."

were decided and processed by the PMU. While the implementation structure was already established in the previous projects, stakeholders noted that introducing the PMU made financial decisions and flows smoother. In the case of government budgets, funds are released in phases as they become available; however, with the PMU, a certain amount could be released at once based on the annual plan of operation. This allowed unutilized funds to be deposited in a savings account to earn interest, which was then used for TCPL incentive payments. The decision to employ the new structure was made after extensive discussions with JICA and became one of the factors contributing to smooth project implementation.

During the project implementation, some scopes were deleted or modified. All such decisions were made after thorough discussions between the executing agency and JICA. Descriptions of the deleted or modified portions of the scope are given in "3.2.1 Outputs." The changes were appropriate in light of the project objective, and they followed appropriate decision-making procedures.

Additionally, lessons learned from similar previous projects indicated the need for guidelines that clearly outline the scale, criteria for site selection, operational standards for forest management committees, and accountability structures to facilitate smooth implementation of afforestation and forest management by community organizations. The project created necessary guidelines and manuals as needed to implement protected area management and ecotourism through community organizations.

Based on the above, it can be concluded that the plans and approaches made during the project appraisal were appropriate.

3.1.2 Coherence (Rating: ③)

3.1.2.1 Consistency with Japan's ODA Policy

In May 2006, the Japanese government established a Country Assistance Program for India, prioritizing "improving poverty and environmental issues." The program explicitly outlined the intention to support biodiversity conservation and the forestry sector, focusing on soil degradation, erosion prevention, and enhancing people's livelihoods. In response, JICA designated "support for environmental and climate change measures" as one of its key areas of assistance for conservation of natural resources and its sustainable use, aiming to restore degraded forests to improve both the quantity and quality of forests, prevent soil degradation, maintain soil and water conservation functions, and support biodiversity conservation. The project matched these policies and was consistent with Japan's ODA policies at the time of the project appraisal.

3.1.2.2 Internal Coherence

This project is the third Japanese ODA loan project in the forestry sector in Tamil Nadu. It was designed to address biodiversity conservation by building on the achievements of previous

afforestation and livelihood improvement efforts, aiming for synergies with earlier projects. TAP II laid the groundwork for biodiversity conservation through activities such as afforestation of degraded forest areas, restoring vegetation, and improving the livelihoods of communities dependent on forests. The project was planned during the implementation of TAP II, expanding biodiversity conservation activities to amplify the outcomes of the previous projects. For example, while the previous projects focused on restoring elephant habitat through afforestation of degraded lands, this project emphasized further habitat restoration and mitigating human-elephant conflict.

Moreover, trust between the TNFD and the local communities gradually developed through the activities of the previous projects. TNFD staff reported that adding this project's activities onto such foundation of mutual trust made all activities much smoother.

In the subsequent project (Phase 2) planned during the implementation of this project, methods for removing invasive alien species and conservation activities for sea turtles and dugongs developed in the project are being expanded.

Restoring forests and ecosystems takes time. The project was mindful of its own design following the previous project and the formation of a successive project, fostering collaboration between them. The continuous support that the TNFD provided to the communities and the environment led to significant results, indicating a high degree of internal coherence.

3.1.2.3 External Coherence

The project aligns with several Sustainable Development Goals (SDGs), specifically Goal 14 "Life below Water," Goal 15 "Life on Land," and Goal 13 "Climate Action."

The project planned to collaborate with local NGOs for community development and livelihood improvement activities. Many NGOs actively participated in the project; some were contracted to create micro-plans for the target communities. Some participated in the project on the basis of their track record built upon locally-based expertise. Notably, the Student Sea Turtle Conservation Network (SSTCN), which has been protecting sea turtles since 1987 along the Chennai beach, contributed its expertise to the project. The project used the knowledge and experience of such organizations, having volunteers from NGOs and the TNFD collaborate in collecting turtle eggs from nesting sites and transferring them to hatcheries. At the onset of project activities, the SSTCN acted as a liaison to facilitate communication between the TNFD and the coastal communities near the nesting sites. The SSTCN reported that partnering with a government agency increased the visibility of conservation efforts and provided a sense of security for nighttime egg collection activities.

Moreover, there were synergy effects with other government projects for biodiversity conservation, such as Project Tiger, Project Elephant, and the Integrated Development of Wildlife

Habitat (IDWH).[9] For instance, funding from the IDWH was allocated for ongoing sea turtle conservation activities between the end of the project and the start of Phase 2, and vocational training was provided to residents near bird sanctuaries.

Furthermore, the TNFD leveraged Corporate Social Responsibility (CSR) funds from private companies[10] for expanding eco-tourism sites and community development. Many mining and infrastructure development companies in Tamil Nadu actively engage in CSR initiatives focused on environmental protection. The TNFD proactively approached these companies to ensure that the communities where they operate benefit from CSR funding. As a result, private companies contributed to the construction of additional facilities at eco-tourism sites and watchtowers in a protected area.

In summary, through collaboration with NGOs and other governmental schemes, and the use of CSR resources, the project achieved concrete outcomes regarding collaboration and coordination during its implementation.

The project was consistent with Japan's ODA policies at the time of the project appraisal, as well as with the policies and development goals of both the Indian and Tamil Nadu governments from the time of the appraisal to the ex-post evaluation. Notably, the project prompted the formulation of related policies and schemes at the state government level, which may provide valuable insights for other projects. The project plan and approach involved thorough consideration of multiple options from various perspectives, which were then reflected in the project design. Changes made during implementation were based on the on-the-ground situation and were properly evaluated through appropriate processes. The project effectively addressed various development needs identified during its appraisal, contributing to overcoming development challenges. As there are synergies with previous and subsequent projects, as well as collaboration with other government programs, agencies, and NGOs, the project's relevance and coherence are very high.

3.2 Efficiency (Rating: ④)

3.2.1 Project Outputs

The planned and actual outputs are shown at the end of the report in "Comparison of the Original and Actual Scope of the Project" or in Attachment 1. Most of the project scope was implemented as planned. However, there were deletions and changes regarding the monitoring of climate change impacts, the installation of electric fences, and the TCPL initiative.

First, the work of monitoring climate change impacts was tendered and an external resource organization was selected. However, the estimated costs significantly exceeded the budget, and

[9] A scheme by the Government of India for mitigating human-wildlife conflict. This scheme also focuses on improving the livelihood of communities living around protected areas.

[10] In India, under the Companies Act, companies with a certain level of revenue, profit, or assets are required to allocate 2% of their net profit to CSR.

the proposed two-phase monitoring plan would not have been completed within the project timeline. After discussions between the TNFD and JICA, it was decided to delete the activity from the project's scope because it was not a core portion of the scope. The scope aimed at establishing long-term protocols and did not affect the overall effectiveness of the project.

The electric fences, which were to be constructed to protect communities and their agricultural lands from wildlife intrusion, were also deleted from the scope. At the beginning of the project, frequent malfunctions, damages, and accidents raised concerns from the target communities. The decision to drop the scope was reached after discussions between the PMU and JICA.

As for the TCPL, it underwent changes due to the following circumstances: Initially, afforestation was to be done in private fallow land by planting a mix of "short rotation species" which has short duration til harvest and "long rotation species" with longer duration til harvest at a ratio of approximately 3:7 among 5,000 farmers in the villages.[11] However, upon starting the activities, it became evident that many interested participants desired only the short rotation species. To promote the planting of long rotation species, households wishing to plant only short rotation species were excluded, which led to a decrease in the expected number of participating households. As a result, the number of target villages was increased to 7,315. Furthermore, by using the remaining balance of the Japanese ODA loan toward the end of the project, an additional 486 villages were included, resulting in an increase of 8,600 hectares in the planted area compared to the original plan.

As noted in section "3.1.1.3 Appropriateness of Project Plan and Approach," these deletions and changes in scope were justified and made through appropriate procedures.

3.2.2 Project Inputs

3.2.2.1 Project Cost

Table 2 indicates the planned and actual project costs.

Table 2: Planned and Actual Project Costs

	Total project cost	Japanese ODA loan
Planned	JPY 12,899 million (Foreign currency JPY 415 million, local currency JPY 12,484 million)	JPY 8,829 million
Actual	JPY 9,255 million (Foreign currency JPY 42 million, local currency JPY 9,213 million)	JPY 7,878 million

[11] To increase the tree cover, the project gave priority to planting of long rotation species.

The total project cost is 72% of the plan, with the ODA loan portion at 89%. Thus, the project cost was within the planned amount. The actual expenditure for the major components is as follows:

- Biodiversity conservation activities: 90% of the plan
- TCPL: 142%
- Institutional capacity development of TNFD:[12] 149%
- Consulting services: 90%

Because of the appreciation of the yen and reductions in the administrative cost, the total project cost was less than initially anticipated at the time of the project appraisal. Regarding TCPL, the actual cost exceeded the planned one because additional villages were included by using the remaining balance of the ODA loan at the end of the project, as explained in the Outputs section. Moreover, the institutional capacity development exceeded the plan, as the increase in TCPL's target villages led to more training for participating households, resulting in a higher number of TNFD staff and local people participating in various training programs.

3.2.2.2 Project Period

At the time of the project appraisal, the implementation period of the project was to be from February 2011 (signing of the Loan Agreement) to March 2019, totaling 8 years and 2 months (98 months), with the completion of biodiversity activities marking the end of the project. At the beginning of the project, there was a delay of about 8 months due to the establishment of the Project Management Unit (PMU) and the hiring of staff. However, any delay was eliminated by adjustments made subsequently that included revising the activities planned for the first year to the following years, speeding up approval processes, and allocating additional personnel. All biodiversity conservation activities were completed by March 2019; however, as there were unused funds in the ODA loan at that point, based on discussions with JICA, TCPL activities were expanded, which continued until December 2020. Although TCPL continued until December 2020, it is important to note that: a) the definition of project completion at the time of the ex-ante evaluation was "completion of biodiversity activities," and b) the main objective of the project was the conservation of biodiversity. Therefore, based on the definition at the time of the ex-ante evaluation, the project period, when comparing the planned one with the actual, is confirmed as being from February 2011 (signing of Loan Agreement) to March 2019 (8 years and 2 months, 98 months), which was within the plan.

[12] Inclusive of the administrative cost

3.2.3 Results of Calculations for Internal Rates of Return

In this project, only the Economic Internal Rate of Return (EIRR) was calculated. Based on the assumptions made at the time of the project appraisal, EIRR at the time of the ex-post evaluation was recalculated. The costs are project expenses (excluding taxes), and maintenance costs. The benefits come from timber revenue from TCPL. The project life was calculated to be 40 years. The EIRR at the time of the appraisal was 10.8%, while it is 11.5% at the time of the ex-post evaluation. However, 11.5% was recalculated based on the data obtained for 143,000 ha of areas under TCPL. As the actual area for TCPL, including the one implemented using the remaining balance of the ODA loan, amounts to 151,600 ha, EIRR at the time of ex-post evaluation would be actually higher than 11.5% when recalculated including the additional 8,600 ha. However, detailed data for the additional 8,600 ha could not be confirmed at the time of the ex-post evaluation.

The project was implemented almost as planned, except for a few portions of the scope being deleted and modified. The decision to delete the installation of electric fences was a sensible change, considering the safety of the widely used electric fences at that time. The monitoring of climate change impacts was deemed not to be a major part of the scope of the project, leading to its deletion, as it could not be completed during the project term. Although the number of trees planted was reduced owing to prioritizing long-rotation species to maintain the target area, the actual area achieved was as planned. Moreover, by using the remaining balance of the ODA loan to add new areas at the time of project completion, the outputs exceeded the initial plan. Both the project costs and period were within the plan. Therefore, efficiency of the project is very high.

3.3 Effectiveness and Impacts[13] (Rating: ④)

3.3.1 Effectiveness

3.3.1.1 Quantitative Effects (Operation and Effect Indicators)

Table 3 presents the indicators defined at the time of the project appraisal, and their baseline, target, and actual figures.

Table 3: Operation and Effect Indicators

Indicator	Baseline	Target (2 years after completion)	Actual (2021, 2 years after completion)
a. Number of protected areas intervened by the project		20	20
b. Number of community organizations established		88	88

[13] When providing the sub-rating, Effectiveness and Impacts are to be considered together.

under the project			
c. Number of small and marginal farmers who planted trees outside the recorded forest areas*		40,000	127,329
d. Plantation area outside the recorded forest areas (ha)		143,000	151,600
e. Survival rate of trees planted outside the recorded forest areas (%) **		70	72
f. Number of TNFD staff trained		5,740	5,423
g. Livelihood improvement (INR/year)	34,031		110,182

Source: Materials provided by JICA and the executing agency
* Although the term "farmers" is used, non-farming households also participated in TCPL and are included in the actual figure.
** Both the target and actual figures are for two years after the planting.

a. Number of protected areas intervened by the project: As planned, the project targeted 12 bird sanctuaries and 8 wildlife sanctuaries/national parks for activities such as habitat and ecosystem restoration, removal of invasive alien species, and construction of water reservoirs for wildlife, achieving its targets.

b. Number of community organizations established under the project: The target was achieved. A total of 30 Eco Development Committees (EDC), 33 Ecologically Sustainable Development Villages (ESD), and 25 Eco Tourism Management Committees (ETMC) were established. An overview of the various community organizations is provided in Table 6 in the Sustainability section. EDCs were registered based on the Joint Forest Management (JFM) guidelines, targeting communities around the protected areas. ESDs focused on villages surrounding reserve forests. As the entire village population was considered for an ESD, it was sometimes unnecessary to form new community organizations; in some cases, ESDs were created by branching off from the existing large Village Forest Committees (VFC). ETMCs were primarily established by self-help groups (SHG) under the EDC to manage eco-tourism. The project provided revolving funds for livelihood improvement to both EDCs and ESDs. Although no data are available based on the poverty rate defined by the Government of India, among members of the community organizations, 59% of households in EDCs and 72% in ESDs had a monthly income below INR 5,000 (approximately JPY 9,300). Moreover, most members belong to Scheduled Tribes, while the rest are from Scheduled Castes[14] or other economically backward groups.

c. Number of small and marginal farmers who planted trees outside the recorded forest areas and

[14] In the Constitution of India, it refers to the population of designated castes. Various preferential measures are provided in such sectors as education and employment for castes that were earlier considered "untouchables," in a similar manner to those for Scheduled Tribes.

d. plantation area outside the recorded forest areas: As mentioned in the Outputs section, the target exceeded in both the number of participating households and the planted area because of the expansion made possible by the remaining balance of the ODA loan.[15] Initially, it was difficult to gain understanding from people regarding long-rotation species owing to the long waiting period until harvest. When only long-rotation species were targeted, the number of participating households decreased, resulting in smaller areas. Therefore, by expanding the target villages, the project achieved far more participating households than planned. While TCPL initially aimed for mainly small farmers to participate, only 49% of the participants were actually small farmers.

e. Survival rate of trees planted outside the recorded forest areas: The target was set for the survival rate two years after planting. The actual rate was confirmed two years after planting in various privately owned lands where planting was implemented in a phased manner. Considering that Tamil Nadu's average rainfall is not particularly high, the survival rate target was ambitious; however, measures taken by beneficiaries, such as the introduction of drip irrigation, led to achieving a high survival rate.

f. Number of TNFD staff trained: Training was conducted in cooperation with the state's forest training institutes and specialized agencies. The training covered a wide range of topics including wetland management, management of invasive alien species, response to wildlife-related incidents, and Geographic Information System (GIS). The project nearly met its target in this indicator.

g. Livelihood improvement: Household surveys were conducted by third parties at the start, mid-term, and end of the project in the 63 villages where EDCs and ESDs were formed. The baseline figure is from the beginning of the project in 2012, and the actual figure was taken from end-line data around 2018. Data from four villages, where average household income could be confirmed in the reports, were used. While no specific target was set, considering that the inflation rate during this period was approximately 36%, the fact that average income tripled from the baseline is a positive change. The qualitative effects of improving people's livelihood is also detailed in the next section.

3.3.1.2 Qualitative Effects (Other Effects)

The expected qualitative effects at the time of the project appraisal included environmental conservation (habitats for birds, dugongs, and sea turtles; removal of invasive alien species; soil and water conservation; and measures against wildfires and poaching), livelihood improvement, and enhancing social and economic capacities of women.

Based on interviews with the executing agency and the beneficiaries, field surveys, and human

[15] Excluding the additional TCPL, the number of the participating households is 101,123, and the afforested area is 143,000 ha.

well-being survey[16] conducted during the ex-post evaluation, it can be concluded that the qualitative effects and impacts of the project were in line with the expectations from the project appraisal. Furthermore, as shown in Figure 1, the project aimed to improve the natural environment through interventions in both the natural and human realms. The environmental improvements resulting from the restoration and enhancement of wildlife ecosystems and habitats can be attributed to the project activities, which triggered various changes in both the natural and human worlds. In the natural world, examples include the following: a) conservation of endangered species, and b) regeneration of natural forests through the removal of invasive alien species. Moreover, as indicated in Column 1, the project caused changes in the human world.

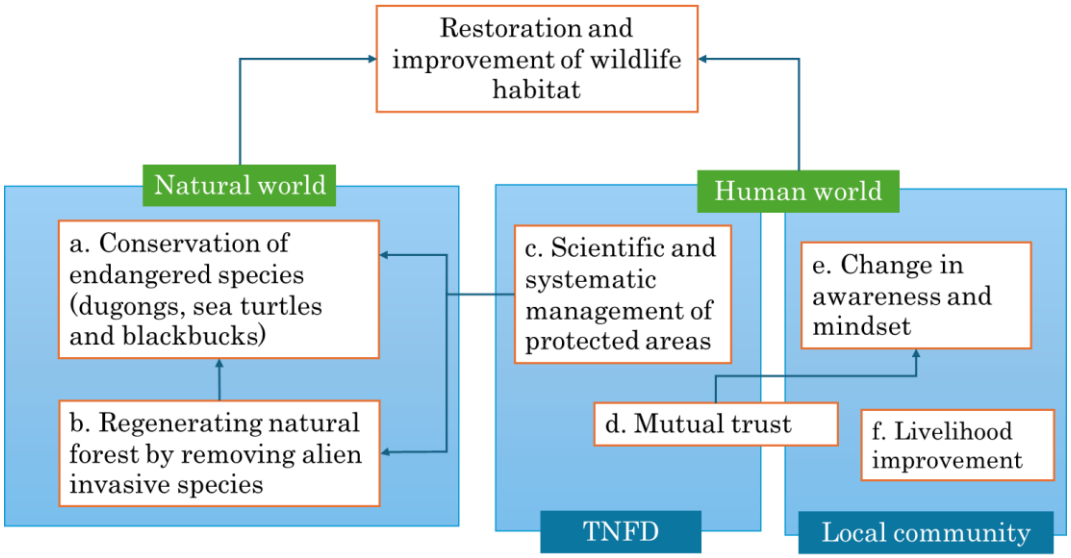

Figure 1: Qualitative Effects of the Project

Regarding b), the project gradually removed invasive species such as mesquite (*prosopis*) originally brought from South America and a type of introduced acacia known as wattle. As a result, the regeneration of native forests and grasses is progressing. In the Kodaikanal Wildlife Sanctuary, 100 ha of wattle was removed by the project. Prior to the British colonization, the area had mountain forests known as sholas, which supported grasses preferred by elephants. In the areas where wattle was removed, native species, including grasses preferred by the elephants, are

[16] Rather than evaluating the project solely based on the achievement of the indicators and targets set during the project appraisal, the survey's objective was to capture the positive and negative impacts on beneficiaries' lives from multiple perspectives. This included investigating and analyzing unintended secondary effects and long-term impacts that were not anticipated as project outcomes. During the first field survey, interviews were conducted with approximately 50 stakeholders including TNFD field officials, local communities and others from the representative project sites. From these, individuals and groups showing changes in personal lives and values due to the project's positive and negative impacts were identified for detailed analysis. Approximately 18 individuals were selected for the interviews, comprising 6 women and 12 men from six project sites, with ages ranging from their 20s to 60s.

gradually regenerating, and the elephants have been sighted more frequently in recent years. Moreover, as wattle had the effect of turning the soil acidic, the pH levels in the areas where it was removed have improved, as shown in Table 4.

Table 4: Changes in Soil pH Level in Kodaikanal Wildlife Sanctuary[17]

Fiscal year	pH level
2013-2014	3.29
2015-2016	4.82
2017-2018	5.20

Source: TNFD

Moreover, the regeneration of grasses preferred by the blackbuck (Indian antelope) led to an increase in herbivore populations and stabilization of their numbers in both Guindy National Park and the Point Calimere Wildlife Sanctuary, as reported by the TNFD field staff. Furthermore, invasive species such as *prosopis* tend to reduce the groundwater level, its removal allowed groundwater recharge, and the local residents reported improvements in water quality.

The effects on the human world benefited both the TNFD, the executing agency, and the local communities (see the right-hand side of Figure 1). For the TNFD, the benefits include capacity building, management of the protected areas based on established management plans, and scientific and systematic management of the protected areas informed by the knowledge and experience gained through the project (refer to "c." in Figure 1). Moreover, the positive relationship that TNFD gradually built with the communities over the years, including the previous projects (refer to "d." in Figure 1), can also be considered a benefit. During the external evaluator's visits to EDCs, both the EDCs and the TNFD stated that their relationship deepened through consultation with the community during the project appraisal, giving due consideration


Shola forest restored (left), blackbuck (right) (Photos by the external evaluator)

[17] Regarding the pH level, 7 is neutral, less than 7 is acidic, and above 7 is alkaline.


Hatchery for the sea turtles (left), EPT (right) (Photos by the external evaluator)

to the communities that had not received support from other schemes, as well as regular visits and timely implementation of activities by the TNFD.

Furthermore, there has been a noticeable change in awareness and values among the beneficiaries triggered by working with the TNFD (refer to "e." in Figure 1). Specifically, in areas where there was little interaction with outsiders before the project, people reported gaining insights on mainstream education and job opportunities through regular contact with TNFD staff and visitors to the eco-tourism sites. They recognized the importance of nature conservation and became aware of the valuable natural resources surrounding them. Moreover, in the communities where child marriage was prevalent, some individuals learned from TNFD staff that marrying minors is undesirable and some expressed a desire to ensure their daughters pursue education, indicating a transformation in social values. In areas where eco-tourism was developed, community organizations manage the sites, providing employment opportunities for the locals. It contributed to improvements in their livelihoods (refer to "f." in Figure 1). As the numbers of native plants and herbivores have increased, sightings of elephants and tigers have also risen, leading to an influx of visitors seeking eco-tourism experiences and contributing to local economic development. Additionally, microcredit was established using the revolving funds provided to EDCs and ESDs, helping people move away from high-interest loans for medical and educational expenses, thereby improving their living standards to a certain extent. Many shops and canteens at the eco-tourism sites are operated by women and SHGs. One woman running a canteen shared, "I previously had no opportunities to work outside the home, but working here has led to my economic and social independence." Further examples of well-being surveys are detailed in Column 2. Moreover, in areas where elephant-proof trenches (EPT) were constructed, reports indicate that intrusions by elephants have been prevented, allowing for an expansion of cultivation land.

From the perspective of Leaving No One Behind, the project primarily targeted rural, remote areas such as forests and protected areas, which are inhabited by socio-economically vulnerable communities. No specific groups were excluded in the project areas, and the project effects were

delivered to vulnerable populations as well.

The operational and effectiveness indicators were mostly achieved. Moreover, as seen in the qualitative effects, various activities contributed to environmental conservation in both the natural and human worlds. Therefore, it can be stated that the project has achieved its objectives more than planned.

3.3.2 Impacts

3.3.2.1 Intended Impacts

At the time of the project appraisal, the expected impacts included contributions to climate change mitigation (approximately 403,000 metric tons of CO_2 equivalent per year) and support for environmental conservation and balanced socio-economic development in the target area. First, regarding the CO_2 equivalent calculations, the detailed methods used during the appraisal were not available; therefore, recalculation was not done at the time of the ex-post evaluation. However, considering that the afforestation area under TCPL was implemented as planned and that the number of long-rotation tree species has exceeded initial expectations, it is fair to state that the target of approximately 403,000 tons of CO_2 equivalent per year has been largely achieved. Contributions to environmental conservation and balanced socio-economic development in the target area are explained in section "3.3.1.2 Qualitative Effects."

Column 1: Strengthening and Accelerating Sea Turtle Conservation Effort

Since the 1980s, the Students Sea Turtle Conservation Network (SSTCN) is an NGO that has been working to protect sea turtles in the coastal areas of Chennai. Prior to the project, the SSTCN was collecting eggs during the nesting season at night to prevent damage from local people and stray dogs, but it struggled to gain the community's understanding. As the project started, the collaboration with the TNFD enabled the SSTCN to expand awareness activities for local people and fishermen, and strengthen the hatcheries. The fact that it operated with the backing of the government helped communicate its legitimacy to the local people, increasing their understanding of conservation efforts. As a result, the number of volunteers collecting eggs increased, raising the egg recovery rate.

Mr. Manoharan from Point Calimere in Nagapattinam District, who had been protecting sea turtles on his own, found it difficult to gain the understanding of his fellow fishermen for many years. However, through his continued volunteer work in the project, his long-standing efforts were recognized, and he was publicly acknowledged by government officials at an event. This led his fellow fishermen to realize the true importance of protecting sea turtles.

In both the SSTCN and Mr. Manoharan's cases, the project prompted local people and fishermen to understand that sea turtles are at the risk of extinction, leading to a significant shift in awareness toward conservation. In the past, when people found eggs, they might have thrown them, but now they are more likely to inform NGO members. Moreover, when sea turtles accidentally get caught in fishing nets, fishermen were accustomed to killing them to protect their nets; now, they prioritize rescuing and releasing the turtles, even at the risk of losing their nets.

3.3.2.2 Other Positive and Negative Impacts

1) Impacts on the Environment

The project was categorized as Category B according to the *Japan Bank for International Cooperation Confirmation of Environmental and Social Consideration* (April 2002), as it was determined that the potential adverse impacts on the environment were not significant, considering the characteristics of the sector, project, and the target areas. Moreover, the environmental impact assessment report related to the project was not mandated by the Government of India. At the time of the project appraisal, it was assumed that adverse impacts on the natural environment would be minimal.

During the project implementation, management plans for the protected areas were developed to ensure that activities were conducted with due consideration to minimize ecological impact. For example, in removing *prosopis*, different areas were targeted in a phased manner to avoid threatening the habitats of deer, which often use bushes of *prosopis* for shade. The tree species selected for planting under TCPL primarily included native species such as teak and neem. Furthermore, according to the TNFD, the use of pesticides and fertilizers is prohibited in the

protected areas; thus, they were not used in the project activities.

2) Resettlement and Land Acquisition

This project involved afforestation on private lands owned by farmers. As the land ownership remained with the original owners, land acquisition or resettlement did not arise.

3) Gender Equality

At the time of the project appraisal, it was planned to implement gender-sensitive, community-based management of protected areas, afforestation activities, and livelihood improvement initiatives through EDCs, SHGs, and other community organizations. Given the differing roles of men and women in activities such as afforestation and eco-tourism, the project aimed to respect women's voices and incorporate a gender perspective. In practice, plans and activities were developed with women's empowerment in mind. For instance, during the formulation of micro-plans by the EDC, considerations were made to identify specific challenges faced by women, and vocational training were arranged in such a way to ensure women's participation. According to the state forest policy, women must comprise half of the members and one-third of the executive committee members in community organizations. An impact assessment[18] conducted in 2022 indicated that women accounted for an average of 44% of the members and 36% of the executive committee members in the community organizations involved in the project.

Column 2: Improvement of Women's Social Status and Economic Independence

Roja, the leader of the MGR Nagar ETMC, has served as the president since the committee was formed in the project. Growing up in a conservative household, she married at age 18 and was extremely shy, unable to speak with strangers or talk in front of large groups. Although she dropped out of school after the 8th grade, because she was good at math, she was asked by women in her locality to become the president of their ETMC. As she overcame the challenge of speaking in public and gradually began to lead the group, she realized she had leadership abilities. Previously a housewife with no work experience outside the home, Roja now earns her own income through a cooking equipment rental business. Moreover, she acts as a liaison and negotiator with various government agencies as a community leader.

4) Marginalized People

As previously mentioned, the project focused on villages predominantly inhabited by Scheduled Tribes, which have high poverty rates and depend heavily on forest resources. In regions with a

[18] JICA and All State Financial Services Private Limited. Impact Assessment Study of JICA Assisted Forestry Project in the State of Tamil Nadu. (2022).

significant Scheduled Tribe population, consultation meetings with the people prior to the project were conducted to ensure that their livelihoods and culture would not be negatively impacted. During the selection of target villages, care was taken to consider the needs of vulnerable population and communities, leading to the establishment of independent community organizations separate from the existing VFCs. This allowed for tailored support that addressed the unique needs of each village based on their social and cultural backgrounds. In the target villages, micro-plans were made with consideration for each community's social and cultural context to guide community development.

Furthermore, while the previous projects benefited communities within the forest areas, this project targeted communities surrounding protected areas and forests. Unlike earlier initiatives that followed a joint forest management approach, the project involved the entire community in directly managing natural resources, and there was less reliance on the TNFD for profit-sharing. To promote biodiversity conservation while ensuring that nearby communities were not overlooked regarding development, the project provided revolving funds to community organizations as part of its strategy.

As stated in “3.1.1.3 Appropriateness of Project Plan and Approach” as a result of considerations such as providing support primarily to communities that have not previously received development assistance from other government agencies, the project's benefits have been fairly extended to people who are often left behind, such as the Scheule Tribes. Furthermore, through interviews with such communities, it was confirmed that there were no negative impacts on their lives or culture because of the project.

5) Social Systems and Norms, People’s Well-being and Human Rights

In the ex-post evaluation, a well-being survey focusing on beneficiaries was conducted. The survey targeted 18 beneficiaries selected during the first field survey. When asked about changes in their subjective well-being before and after the project, all the respondents indicated positive change. When they were further asked about the factors contributing to this change, several unexpected effects were identified. These included the joy stemming from local people gradually understanding the importance of sea turtle conservation and the satisfaction derived from exercising leadership abilities and becoming important figures in their communities, in addition to the changes in awareness and values noted as qualitative effects.

The well-being survey brought to light various project impacts. As it is challenging to isolate other impacts, detailed insights from the survey are explained in "3.3.1.2 Qualitative Effects" and in the columns.

Regarding effectiveness of the project, the operational and effect indicators are mostly achieved, and qualitative effects surpass expectations from the time of the project appraisal. In particular,

the positive relationships built between TNFD staff and local people have led to significant changes in awareness and values among people, resulting in considerable transformations in both the natural and human spheres. These combined effects have greatly contributed to ecosystem improvements. Moreover, there is visible contribution to environmental conservation and balanced socioeconomic development in the target areas. Therefore, effectiveness and impacts of the project are very high.

3.4 Sustainability (Rating: ④)

3.4.1 Policy and System

At COP26[19] in 2021, Prime Minister Modi announced the "Lifestyle for Environment (LiFE)" initiative to encourage consumers and citizens to adopt behavior changes and promote environmental protection and sustainable lifestyles based on traditional values and practices of environmental conservation.

Additionally, to bolster climate change measures, the Ministry of Environment, Forest and Climate Change in India established a Green Credit Program in 2023. This program aims to enhance forest cover through afforestation, improve water management, promote sustainable agriculture, manage waste, reduce air pollution, develop eco-labels for environmentally-friendly products, protect and restore mangroves, and support activities related to environmentally-friendly buildings and infrastructure.

As noted in the Relevance section, both the Indian and Tamil Nadu governments continue to regard forests and biodiversity as vital areas of focus. Recent initiatives such as the Green India Mission, the *National Wildlife Action Plan (2017–2031)*, the *State Climate Change Action Plan Draft 2.0*, the Green Tamil Nadu Mission, and the *Tamil Nadu Policy on Invasive Alien Species and Ecological Restoration of Habitats* demonstrate a strong commitment from both the central and state governments. As new programs and schemes are being developed, there are policies and systems to ensure that biodiversity conservation will stay in place.

3.4.2 Institutional/Organizational Aspect

The TNFD, the executing agency, is the Tamil Nadu state government department responsible for planning and executing forest and wildlife conservation effort. The implementation of the project is managed by a Project Management Unit (PMU) established in the TNFD. There has been no change regarding the delegation of responsibilities to the TNFD within the state government since the time of the project appraisal.

According to the plan made at the time of the project appraisal, the TNFD was to be responsible for the operation and maintenance of the assets created through this project. Furthermore, the

[19] The 2021 United Nations Climate Change Conference.

TNFD was to secure budget for continuing the support for the VFCs and other community organizations as part of its routine operations. Additionally, the VFCs, EDCs, and SHGs involved in the project were expected to continue their activities independently after the project's completion.

At the time of the ex-post evaluation, Phase 2 of the project is being implemented, with the PMU in charge of its implementation. The PMU continues to be responsible for the operation and maintenance of the project. Table 5 presents the staffing situation of PMU as of February 2024. While there are several vacancies in administrative positions, the roles in the organization are clearly defined, and no issues related to daily operations due to personnel shortages have been reported.

Furthermore, an operational manual for the PMU was developed, clearly delineating responsibilities. It should be noted that, at the field level, TNFD staff were conducting project activities in parallel to their departmental duties.

Table 5: Human Resource Allocation in PMU

<Technical>

Post	Sanctioned post	Man in position (Feb 2024)
Chief Project Director	1	1
Project Director (A&F)	1	1
Project Director (Bio)	1	-
Project Director (TCPL)	1	1
Total	**4**	**3**

<Administrative>

Post	Sanctioned post	Man in position (Feb 2024)
Financial Controller (CAO)	1	1
Asst. Conservator of Forests	1	1
Asst. Director of Statistics	1	
Forest Range Officer	3	2
Forester	6	6
Statistical Officer	3	2
Statistical Inspector	3	3
Computer Programmer	1	1
Superintendent	2	2
Assistant	2	1
Steno Typist	5	3
Total	**28**	**22**

Source: TNFD

In the project, 30 EDCs, 33 ESDs, and 25 ETMCs were newly established. Table 6 presents the definition of each community organization, main activities, and their source of funds.

Table 6: Overview of Community Organizations

Organization	Purpose and activities	Source of funds
Village Forest Committee	Established for the sustainable management of forest. Registered under the JFM Act of Tamil Nadu.[20]	From membership fees, revolving fund provided by the project, and profit sharing from non-timber forest produce
Eco-Development Committee	Responsible for activities in and around the protected areas and biodiversity conservation. Registered under the same regulation as VFC, but the only difference is the areas EDCs operate are in the protected area, not in the forest. Hence, profit-sharing from non-timber forest produce does not arise. In contrast, they operate ecotourism and the revenue from the activities are owned by EDCs.	From membership fees and revolving fund provided by the project
Ecologically Sustainable Development Village	VFC specialized for Scheduled Tribes that exist around forests and protected areas, with no potential for economic activities such as ecotourism. Some ESDs were created by becoming independent from existing VFCs.	
Self-Help Group	Savings in the group and livelihood improvement activities.	Lending from EDC and ESD
Eco-Tourism Management Committee	Created for operating ecotourism. Some ETMCs consist of SHGs under the umbrella of EDCs, while others comprise members from multiple EDCs.	Revenue from ecotourism

Among the organizations above, EDCs and ETMCs were involved in the project's operation and maintenance through ecotourism. Both organizations are engaged in the daily operations of ecotourism as institutions even after the completion of the project. The following are examples of the operation and maintenance conducted by EDCs and ETMCs:

- Mannavur Kaikatti EDC: Operates hiking, basket boats (coracles), and kayaking around a lake outside the Kodaikanal Wildlife Sanctuary. Women from SHGs also run a canteen at the site. They have expanded their activities after the project completion by introducing a zip-line activity using revenues from ecotourism.
- Kalikesam ETMC: Operates an information center and basket boats around the Kanyakumari Wildlife Sanctuary. It manages four rooms of a guesthouse and a canteen. The ten employees are members of several EDCs.
- Karankadu EDC: Operates boat ride and canteen in the mangroves that are the habitat for dugongs. The businesses are run by employees and local volunteers.
- Point Calimere ETMC: Manages a safari within the Point Calimere Wildlife Sanctuary, handling collection of entry fees and driving the safari jeeps.

[20] Although VFCs were not formed under the project, they were established under TAP I and II.

3.4.3 Technical Aspect

The TNFD had experience with two ODA loan projects, which were completed without delay and yielded good results. The staff of the TNFD are Indian Forest Services or state forest services, recruited through a competitive exam and trained through courses established over many years. Therefore, they possess the necessary knowledge and skills for forest management, as well as a certain level of understanding regarding biodiversity conservation. In the project, various training sessions were planned to enhance the capacities of new staff regarding forest management and biodiversity conservation, which means there were no particular concerns regarding their technical capacity at the time of the project appraisal.

During the ex-post evaluation, regular training for staff was being conducted. The TNFD regularly assesses the training needs of its staff, identifying the knowledge and skills necessary for each member to fulfill their duties. Training sessions are provided by Indian forestry training schools and other specialized institutions. Operational manuals related to the project have been developed and are being utilized by relevant parties.

In the target protected areas of the project, activities were conducted based on a management plan, which is typically valid for five years. A new management plan is developed every five years.

Several capacity building training sessions were offered to community organizations as part of the project. Training was conducted on mitigating human-wildlife conflict and on the operation and maintenance of ecotourism, involving both TNFD staff and community volunteers. For the latter, a training manual was also developed. Regarding TCPL, on-site training was conducted on tree planting methods and on how to care for the planted trees.

As stated above, TNFD staff possess the necessary knowledge and skills as forest officers, with ongoing capacity building based on training needs. Various training sessions were also held for community organizations during project implementation, and no particular technical issues were observed.

3.4.4 Financial Aspect

In the ODA loan projects previously implemented by TNFD, there were no significant financial issues. For the funding related to the executing agency in the project, appropriate budgetary measures were expected to be in place, and there were no particular concerns regarding financial aspects.

In fact, the budget allocation from the state government to the TNFD has been conducted smoothly so far, and this was confirmed during interviews conducted during the ex-post evaluation. Between the completion of the project and the commencement of Phase 2, the budget for operation and maintenance was contributed by the state government or from existing schemes. Since fiscal year 2022, the budget has been included in Phase 2 of the project as the successive project started. At the same time, the budget for the maintenance activities of sea turtle

conservation and removal of invasive alien species is partly contributed by the IDWH.

At the ecotourism sites operated by EDCs and ETMCs, necessary costs are covered by entrance fees and facility usage fees collected from the visitors.

Regarding the revolving funds used for loans to EDC and ESD members, an impact assessment that looked into the repayment status of 34 groups, indicated that individual loans have better repayment conditions than loans to SHGs. Qualitative survey interviews revealed that in relatively small EDCs and ESDs, there are cases where loans are provided in turns to all members. In such cases, there is strong trust within the community, which means that, while repayments may take time, issues such as defaults have not occurred.

As stated above, there are multiple sources of funding to sustain the biodiversity conservation activities implemented in the project, and the financial resources at the ecotourism sites are secured. Thus, there are no financial problems.

3.4.5 Environmental and Social Aspect

In the project, from the time of the project appraisal and throughout the implementation, no negative impacts on the natural environment were anticipated, and such cases were not confirmed retrospectively. Moreover, the project was designed in such a manner that beneficiaries receive the benefits of the project equitably in the community. Special consideration was given to communities that are socially vulnerable, by such means as establishing new ESDs specifically for particularly impoverished villages or for those composed solely of Scheduled Tribes from the VFCs formed in the previous projects.

3.4.6 Preventative Measures to Risks

Biodiversity conservation is subject to various risks because of uncertainties inherent in the environment. The project recognized the importance of adaptive management, demonstrating a willingness to assess the constantly changing environment and adjust the management and activities of the protected areas as needed.

Moreover, no unexpected risks were reported from interviews with the PMU, field staff, and community organizations.

3.4.7 Status of Operation and Maintenance

In the ex-post evaluation, the conditions and methods of operation and maintenance of the major sites and facilities for the project were confirmed as follows:

Protected areas: Maintenance is conducted based on the established management plan. Typically, management plans are valid for five years, and new plans are developed for protected areas that reach this five-year mark.


Eco-tourism site (left), wattles removed (right) (Photos by the external evaluator)

Habitat (Areas where invasive species have been removed): The TNFD conducts regular maintenance to prevent the regeneration of invasive species.

Ecotourism sites: The external evaluator visited seven sites, all of which have been in operation for less than ten years. Overall, these sites are well-maintained, and facilities such as boats and accommodations are kept clean. The operating communities and TNFD field staff conduct regular inspections.

EPT: Maintenance is conducted every 5 to 10 years under the Project Elephant budget. This includes the removal of vegetation from trenches and repairs of eroded portions. The EPT sites in Erode and Coimbatore had already undergone such maintenance after the completion of the project.

Watering holes for the wildlife: Regular inspections and cleaning are conducted by the TNFD. The watering hole for elephants surveyed in Coimbatore is inspected and cleaned weekly.

The protected areas managed by the TNFD have secured budget and been maintained according to management plans. Continuous measures are taken to suppress the regeneration of invasive species in the areas where they have been removed. Other facilities do not appear to have issues related to budget or personnel and are managed properly.

All ecotourism sites are relatively new and are being managed well. There are no financial issues reported.

From interviews conducted at each site, no specific problems or deficiencies in operation and maintenance were noted. Several EPT sites expressed that adding hanging electric fences would be more effective.

In the project, there is a strong commitment at both the central and state levels, and new related programs and schemes have been established, providing a solid foundation for policy and system to continue promotion of biodiversity conservation. Operation and maintenance responsibilities are shared between the TNFD and community organizations, with the TNFD deploying personnel who possess sufficient technical knowledge and skills. Financially, the TNFD has secured

adequate funding through its budget and coordination with existing schemes. Similarly, community organizations have suitably allocated personnel needed to operate and maintain ecotourism sites, and no issues have been observed in terms of technical or financial aspects. Thus, a proper system for operation and maintenance, along with the necessary technical capacity and budget, is in place, ensuring that the facilities and ecotourism sites developed through the project are managed appropriately. No negative impact is observed regarding environmental consideration, and due consideration has been given to people with vulnerable background. Risks have been well mitigated. Therefore, the sustainability of the project effects is very high.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project was implemented in Tamil Nadu in southern India, with the objective to conserve biodiversity by strengthening the management of protected areas, planting trees outside of forest areas, improving livelihoods, and enhancing the operational capacity of the forest department thereby contributing to environmental conservation and harmonized socio-economic development. The project is evaluated very high on relevance and coherence, efficiency, effectiveness and impact, and sustainability.

Regarding the relevance and coherence, the project was aligned with the policies and development needs of both the Indian and Tamil Nadu governments from the time of project appraisal to that of the ex-post evaluation. It addressed various development needs identified during the appraisal and contributed to resolving them. The project's design and implementation were adjusted to create synergies with previous and subsequent projects from the project planning stage, which is highly commendable. Owing to its collaboration with other government schemes and organizations, the project has prompted the formulation and issuance of multiple new policies, schemes, and government directives in the country. Regarding efficiency, the project was implemented largely as planned, except for a few deletions or modifications of its scope, and both the project cost and duration remained within the original plan. Effectiveness and impact generally achieved the quantitative targets, while several unexpected impacts were identified. Notably, the executing agency's focus on building mutual trust with local community organizations is a key lesson from the project. Sustainability is also ensured, with organizational structure, technical capacity, and budget in place for continuing similar activities in the future. No significant risks that could undermine the project effects were identified.

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

Project implementation through mutual trust with community organizations

In the project, strong emphasis was placed on forging a positive relationship between the TNFD and the members of community organizations. Through dialogues with people during the appraisal stage, giving due attention to communities that had not received support from other schemes, and regular visits by field staff, mutual trust was gradually built. In some cases where there had already been connections established from earlier projects, trust deepened over years of interaction. Such trust facilitated smooth communication, allowing people to obtain various information from TNFD staff. This, in turn, led to shifts in awareness and values, enhancing understanding of the importance of protecting the natural environment and coexisting with wildlife. As a result, these elements contributed significantly to the smooth implementation of project activities and bringing about successful outcomes.

5. Non-Score Criteria

5.1 Performance

5.1.1 Objective Perspective

None

5.1.2 Subjective Perspective (retrospective)

None

5.2 Additionality

None

(End)

Comparison of the Original and Actual Scope of the Project

Item	Plan	Actual
1. Project Outputs		
A. Biodiversity conservation	Habitat restoration	Almost as planned
	Resource protection	Almost as planned
	Reduction of human-animal conflict	Almost as planned
	Ecologically sustainable development	As planned
B. Increasing the natural resource base (afforestation outside forest area)	TCPL	Activity expanded
	Research	As planned
C. Institutional capacity development	Capacity development	More than planned
	Monitoring and evaluation	As planned
	Project management	As planned
D. Consulting services	International consultants 13 M/M National consultants 97 M/M	As planned
2. Project Period	February 2011–March 2019 (98 months)	February 2011–March 2019 (98 months)
3. Project Cost		
Amount Paid in Foreign Currency	JPY 415 million	JPY 42 million
Amount Paid in Local Currency	JPY 12,484 million (INR 6,640 million)	JPY 9,213million (INR 5,583 million)
Total	JPY 12,899 million	JPY 9,255 million
ODA Loan Portion	JPY 8,829 million	JPY 7,878 million
Exchange Rate	INR 1.00 = JPY 1.88 (As of September 2010)	INR 1.00 = JPY 1.65 (Average between January 2011 and December 2020)
4. Final Disbursement	December 2020	

Attachment 1: Planned and Actual Project Outputs

	Plan	Actual
A. Biodiversity conservation		
a. Habitat restoration, enhancement and management		
Strengthening of wetland planning and management	12 bird sanctuaries	
Conservation of critically endangered species of flora/fauna	9 circles	
Improvement of critical habitats by removing invasive and exotic species	3,000 ha	
Improvement of management of water, habitat and herbivores in Guindy National Park	50 ha	48 ha
Improvement of management of water, habitat and herbivores in Vallnadu Black Buck Sanctuary	50 ha	45 ha
Improvement of management of water in Protected Areas and Reserve Forests	80 places	81 places
Monitoring the impacts of climate change on biodiversity	—	—
b. Resource protection		
Strengthening of monitoring the incidences of fire, poaching and encroachment in Protected Areas and Reserve Forests	16 places	
Procurement of equipment for strengthening network of field officers	Binoculars, GPS, firefighting suits, firefighting equipment, communication devices, vehicles and motorcycles for forest officials, walkie-talkies, mobile phones, etc.	
Consolidation of forest boundaries by construction of Reserve Forest cairns	80,000	60,000
c. Reduction of human-animal conflict		
Identification and management of traditional migratory route	14 Divisions	
Establishment of solar-powered fencing	200 km in total	—
Establishing elephant-proof trench	400 km in total	381 km in total
Procurement of equipment to return strayed wildlife into its natural habitat	Cage, net, syringe, vehicles, etc.	
Training on dealing with human-animal conflict	Approximately 30 persons	28 persons
d. Ecologically sustainable development		
Socio-economic and forest development surveys	63 villages	
Eco-development activities	30 villages around Protected Area	
Ecologically sustainable development	33 Scheduled Tribe villages	
Community-based ecotourism	25 sites	
B. Increasing the natural resource base (afforestation outside forest area)		
a. TCPL	Plant 100 million trees in 143,000 ha of fallow land	Planted 80 million trees in 143,000 ha + 8,600 ha (total 151,600 ha)
b. Research		As planned
C. Institutional capacity development		

a. Capacity development of TNFD staff	23,959 persons	27,311 persons
b. Capacity development of TCPL villages	5,000 villages	7,315 villages + 486 villages (7,801 villages in total)
c. Monitoring and evaluation		As planned
d. Project management		
Construction of buildings	144	143
Augmentation of office facilities and equipment		As planned
Strengthening mobilities	178	174
Project management staff		As planned
D. Consulting services		
a. Technical support related to the implementation methods of business activities for the Project Management Unit (PMU) b. Support regarding financial management, annual planning, and report preparation c. Support for planning and updating biodiversity and reforestation activities, as well as conducting various surveys, etc.	As planned	