Republic of India

FY2023 Ex-Post Evaluation Report of

Japanese ODA Loan Project

"Rajasthan Forestry and Biodiversity Project (Phase 2)"

External Evaluator: Shima Hayase, IC Net Limited

0. Summary

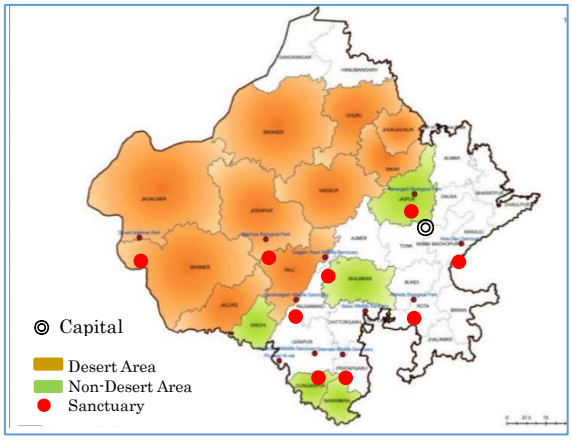
The objective of this project is to strengthen forest management, enhance biodiversity conservation, and improve the livelihoods of local communities through afforestation and biodiversity conservation activities under a community-based joint forest management (JFM) approach, thereby contributing to environmental conservation and balanced socio-economic development and climate change mitigation of Rajasthan in northwestern India.

The project's relevance and coherence are very high. From the time of project appraisal to the ex-post evaluation, it was aligned with the policies and development objectives of both the Indian and Rajasthan state governments. It addressed various development needs, such as sustainable forest management, balancing biodiversity with people's livelihoods, and contributing to social development through poverty reduction. Synergy with previous and similar projects has been evident in the long-term activities of afforestation. Collaboration in the conservation of endangered species has been widely recognized as a successful model and has contributed to similar projects in other states. Regarding efficiency, the project was largely implemented as planned, except for some modifications to its scope. While the project duration exceeded the original plan due to establishing the implementation structure and adjusting the additional scope, the project costs remained within the planned budget. Thus, efficiency is high. Effectiveness and impact are high. The quantitative targets are generally achieved, while expected impacts are identified. Additionally, its contribution to improving the satisfaction level of life and happiness has been observed. This success can be attributed to the executing agency's emphasis on building trust with local communities in the target areas while implementing participatory activities.

Sustainability is very high. In addition to the policies and systems, the executing agency and the community organizations that participated in the project have secured structures, technical capacity, and budgets for continuing operation and maintenance. No significant risk that could undermine the project effects was identified.

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

1. Project Description



Project Location
(source: Project Completion Report)

Photo1: Indian Bustard Sanctuary
(Photo by the external evaluator)

1.1 Background

Rajasthan State has a harsh climate for forest development, with two-thirds of its area covered by the Thar Desert. The forests in the state have challenges in both quantity and quality. Overuse of forest resources by grazing and population growth and the progression of desertification have resulted in a low forest cover rate of 7.1% (as of 2006) and a high percentage of open forests of 71.8%[1]. The livelihoods of rural residents, who depend on forest resources for fuelwood, charcoal, and livestock feed, have been increasingly threatened due to shortages in these supplies caused by the growing population and livestock numbers. This has underscored the need to strengthen sustainable forest management through community participation. Moreover, Rajasthan is home to unique ecosystems in dryland areas that support a diverse range of flora and fauna. However, the increasing population and livestock numbers have led to habitat degradation, and even around protected areas, pressure on natural resources is rising, threatening habitats. As a result, the need for joint management of protected areas with the participation of local communities has become more critical.

In response to these challenges, in the *Rajasthan State Forest Policy 2010*, the State Forest Department set its goal to achieve a forest cover rate of over 20%. It promoted large-scale afforestation activities across 45,000 km². The policy highlighted the need to strengthen measures against desertification through sand dune stabilization via afforestation and to enhance biodiversity conservation.

[1] According to the Forest Survey of India (FSI), a subordinate organization under the Ministry of Environment, Forest and Climate Change of India, "open forest" refers to all land with tree cover (including mangrove cover) where the canopy density ranges from 10% to 40%.

1.2 Project Outline

The objective of this project is to strengthen forest management, enhance biodiversity conservation, and improve the livelihoods of local communities through afforestation and biodiversity conservation activities under a JFM approach, thereby contributing to environmental conservation and balanced socio-economic development and climate change mitigation of Rajasthan in northwestern India.

The executing agency for this project is the Rajasthan Forestry Department (RFD). The JFM-based afforestation activities were implemented in collaboration with the Village Forest Protection and Management Committees (VFPMCs), which residents of the target communities formed. VFPMCs worked with the RFD from the planning stage through afforestation, nurturing, maintenance, and harvesting forest products. The distribution of duties, rights, and benefits for the VFPMC members was formalized through a Memorandum of Understanding (MoU) with the RFD, guaranteeing their right to obtain forest products through the proper implementation of forest management.

Biodiversity conservation activities were carried out by Eco Development Committees (EDCs), which are community-based management groups established by the state's conservation management plans and operated under the technical guidance of the RFD.

Within the VFPMC and EDC groups, Self-Help Groups (SHGs) were formed, primarily consisting of residents with high dependence on forest resources and those from economically disadvantaged backgrounds. These SHGs received training from the RFD, NGOs, and other organizations and engaged in small-scale activities such as seedling production and the processing of forest products.

Loan Approved Amount / Disbursed Amount	15,749 million yen / 15,070 million yen	
Exchange of Notes Date / Loan Agreement Signing Date	June 2011 / June 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 / Rajasthan Forest Department	
Project Completion	October 2021	
Target Area	Rajasthan State in Northwestern India	

Main Contractor(s) (Over 1 billion yen)	-
Main Consultant(s) (Over 100 million yen)	Consortium: Nippon Koei India PVT. LTD. (India) / Earth Care Consultants (P) LTD. (India) / Nippon Koei (Japan)
Related Studies (Feasibility Studies, etc.)	The preparatory survey on Rajasthan Forestry and Biodiversity Conservation Project (December 2010 - January 2011)
Related Projects	<Japanese ODA loan> Rajasthan Forestry and Biodiversity Project (L/A: March 2003), Rajasthan Forestry Development Project (L/A: February 1995), Aravalli Mountains Afforestation Project (L/A: January 1992), Afforestation and Pasture Development Project Indira Gandhi (L/A: January 1991) <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

Shima Hayase, 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 19–March 9 and August 18–September 1, 2024

2.3 Constraints During the Evaluation Study

The target area of this project included 15 districts within the state (10 in desert areas and five in non-desert areas), as well as seven wildlife protection areas and surrounding areas, covering a broad geographic scope. However, due to the limited number of survey days available for this evaluation, conducting field visits to all sites was not feasible. As a result, operation and effect indicators were derived from data provided by the executing agency. A selection of representative project sites was made, and field surveys were conducted along with interviews with community organizations involved in the project to infer the overall outcomes.

3. Results of the Evaluation (Overall Rating: A[2])

3.1 Relevance/Coherence (Rating:④[3])

3.1.1. Relevance (Rating:④)

3.1.1.1 Consistency with the Development Plan of India

In national policy, from the perspective of climate change measures, the improvement of forest cover and biodiversity conservation have been consistently prioritized from the time of appraisal to ex-post evaluation. In the national policy during the appraisal, the *11th Five-Year Plan 2007-2012*, alongside the increase in forest cover and the restoration of degraded forests, the promotion of joint activities with local communities for sustainable forest management and wildlife protection, support for alternative income sources for those dependent on forest resources, and efforts to mitigate human-wildlife conflict were emphasized. The *National Forest Policy (NFP)*, a sectoral development plan, was established in 1952, and national parks and sanctuaries for wildlife protection were set up. Following this, the *Wildlife Protection Act* of 1972 and the *Biodiversity Conservation Act* of 2002 were enacted, strengthening efforts for biodiversity conservation. In June 2008, a national action plan on climate change was formulated, within which challenges related to greening and ecosystem conservation were identified as national missions, further increasing attention to climate change measures.

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

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

At the time of ex-post evaluation, based on the *Nationally Determined Contribution (NDC)* approved by the Cabinet Secretariat of India, it was pointed out that about 85% of the country is highly vulnerable to natural disasters. Considering this, a goal has been set to increase the forest cover from 25% to 33% by 2030 and create additional carbon emissions by achieving 250 to 300 million tons of CO^2 equivalent through additional forest and tree cover. A national-led afforestation program, the *Green India Mission (GIM)*[4] aims to mitigate the impacts of climate change while balancing ecosystem conservation with people's livelihoods, such as food, water, and income.

In Rajasthan, afforestation and biodiversity conservation have been consistent state policies. At the time of ex-post evaluation, forest policy, climate change action plans, and ecotourism were introduced, with a focus on social development also included.

Thus, afforestation, biodiversity conservation, and climate change mitigation remain key focus areas for both the Indian and Rajasthan state governments, and they are highly relevant to the project.

3.1.1.2 Consistency with the Development Needs of India

As described in "1.1 Background," Rajasthan has a vast desert area with low rainfall, and even at the time of the ex-post evaluation, the state's forest cover rate stands at 9.6%, which is below the national average of 24.4% (World Bank data, 2021). Additionally, Rajasthan has the second-largest total livestock population in the country, with 56.8 million heads, most of which are raised through grazing[5]. This puts pressure on forest resources as livestock relies on them for feed, raising concerns about the negative impact on forest and wildlife conservation. The forest dependence of people in villages surrounding forests is high, and there is significant pressure on forests to meet the demand for fuelwood, fodder, and small-scale timber[6]. On the other hand, Rajasthan is rich in biodiversity[7], contributing significantly to tourism, the state economy, and the livelihoods of tribal and indigenous communities living in the forested areas and their surroundings. The state has three national parks, 26 wildlife sanctuaries, and 22 nature reserves. Still, habitat degradation due to population and livestock increases has led to the risk of extinction for approximately 70 endemic species.

This project has contributed to addressing these challenges related to forest and ecosystem

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[4] One of the eight missions under the *National Action Plan for Climate Change (NAPCC)* launched in February 2014. It aims to recognize the critical impacts of forestry on ecosystems' sustainability, biodiversity conservation, and food, water, and livelihoods in response to the risks of climate change.

[5] The 20th Livestock Census of 2019

[6] According to *Rajasthan Forest Policy 2023*, the forest dependence of people in villages on the forested peripheries is estimated to be as follows: fuelwood (8.5 million tons), fodder (112.7 million tons), bamboo (3,698 tons), and small timber (82,482.4 thousand cubic meters). https://www.rajras.in/rajasthan-forest-policy-2023/ (accessed December 10, 2023).

[7] Approximately 2,500 species of plants, around 450 species of birds, about 50 species of mammals, around 20 species of reptiles, about 14 species of amphibians, and many other insects and small plants and animals inhabit the area.

conservation. Even at the time of ex-post evaluation, many needs remain, indicating that the project continues to align with the ongoing development needs.

3.1.1.3 Appropriateness of the Project Plan and Approach

1) Project Plan and Approach

In this project, afforestation was carried out over an area of more than 80,000 hectares in 15 districts in the state, with the management committees of 590 villages involved. Additionally, biodiversity conservation activities were carried out in seven wildlife protection areas and surrounding regions by 60 villages. Furthermore, regional development and livelihood improvement activities were planned in these 650 villages in total. To ensure the smooth implementation of such a large-scale project, the following strategies were incorporated into the project planning and execution:

A. Utilization of New Technologies: Geographic Information Systems (GIS) were used to select afforestation sites and soil and water conservation facilities. GIS facilitated the analysis of topography and watercourses, as well as the creation of topographic maps, improving the efficiency of site selection. Satellite data analysis was also employed to monitor afforestation areas, enabling the assessment of the vast afforestation target areas. The Management Information System (MIS) was applied to collect data on the progress of afforestation and wildlife protection area monitoring, as well as the activities of local community organizations. Information gathered by forestry officers was immediately sent from smartphones or tablets to the state's MIS server. The data integrated into the database could be accessed through a dedicated internal website.

B. Building Trust with Forest Officers in Charge of Villages: Many of the villages participating in this project were located in remote areas inhabited by designated tribes or castes[8]. Due to their remote nature, these regions had not received support from other donors or government agencies. Forest officers were involved not only in guiding activities such as afforestation and the construction of soil and water conservation facilities but also attended village board meetings as observers. In addition to these professional duties, forest officers frequently visited the villages and assisted residents with tasks beyond the project's scope, such as removing dangerous animals like leopards and cobras and delivering medicine to those without access to transportation. These efforts built trust between the villagers and the forest officers, facilitating the smoother implementation of the project activities. RFD recognizes the importance of forest officers' roles and trust-building with local communities in participatory afforestation and biodiversity conservation. As part of the hiring criteria for forest officers, they must be from local and understand local culture and dialects.

[8] In the Indian Constitution, it refers to the population of designated castes. Similar to the Scheduled Tribes, castes that were initially considered "untouchable" are entitled to various affirmative measures in areas such as education and employment.

C. Ensuring Fairness: National and state-level JFM implementation guidelines have been established for the project's implementation. The afforestation and biodiversity conservation activities of this project were carried out in a participatory manner in accordance with these guidelines. The state guidelines include provisions that ensure fairness and equity within the community, such as decision-making and financial management by local organizations (VFPMC/EDC) and ensuring that the proportion of women in committee membership is at least 30%. By signing a memorandum of understanding (MOU) with the RFD, all participating organizations carried out the project while adhering to these guidelines.

D. Introduction of Mutual Visits: During the preparatory survey, once the target areas and local organizations were identified, domestic visits and study tours were incorporated into the plan through a proposal from JICA. For matching between local organizations, support was provided by JICA local staff responsible for afforestation, helping with information from other states, and coordinating visits. This initiative, unique to JICA, was based on the extensive experience of implementing JFM projects within and outside the state. The examples are described in the section on the "Internal Consistency" section.

E. Introduction of NGO Support: The project was designed to have NGOs provide guidance and support for the community organizations' local development and livelihood improvement activities. NGOs that provided appropriate guidance and support helped the community groups achieve sustainable activities and income improvement. However, some NGOs lacked the necessary capacity or engaged in actions such as manipulating information. As a result, the PMU (Project Management Unit) terminated their contracts, and instead of the NGOs, forest officers from the RFD's local offices supported the community organizations.

F. Promoting Understanding of Environmental Conservation: To conserve the wildlife sanctuary, the project adopted the method of constructing a fence to enclose the area. Residents who had previously engaged in grazing or unauthorized farming within the sanctuary had to be excluded. Instead of forcibly evicting these residents, the RFD forest officers created alternative employment opportunities and held discussions to explain the benefits that the enclosure would bring to the community in the future. They also explained the consequences of not implementing the enclosure. Eventually, through the successful recovery of the nesting sites of the endangered Great Indian Bustard (GIB), an increase in the number of insects for food, and a rise in the population of species living in the natural environment, the project was able to demonstrate the economic benefits to the community through conservation and eco-tourism

2) Application of Evaluation Results and Lessons from Similar Past Projects to This Project:

From the lessons learned from similar projects, it was indicated that smooth implementation of JFM requires the creation of guidelines that comprehensively and clearly outline the selection of activities, operational standards, responsibilities, and other aspects in simple, everyday language.

It also emphasizes the need to develop activities based on the local community's needs.

In implementing this project, RFD prepared detailed operational guidelines with illustrations, which were utilized for the activities in all organizations. The target forest area was selected using GIS data, with RFD proposing locations suitable for afforestation and appropriate soil and water conservation measures. The specific activities, such as tree species selection, were chosen based on the preferences of each village during the entry-point activities[9]. Furthermore, decision-making within the villages was done in a participatory manner, ensuring that the activities adequately reflected the needs of the residents. Therefore, it can be said that the lessons learned from previous projects were effectively applied.

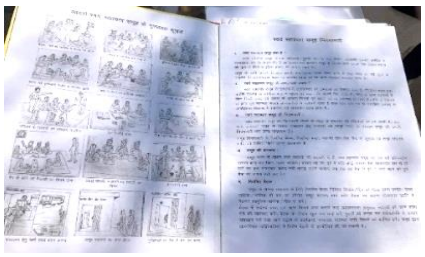

Photo 2: Operational Guideline

Based on the above, the plan and approach at the time of the appraisal were deemed valid for this project.

3.1.2 Coherence (Rating: ④)

3.1.2.1 Consistency with Japan's ODA Policy

The *Japan Government's Country Assistance Program for India* (May 2006) prioritizes "improving poverty and environmental issues" and explicitly outlines support for biodiversity conservation and the forest sector, focusing on soil degradation, erosion prevention, and the enhancement of local livelihoods. In line with this, JICA has identified "support for environmental and climate change measures" as a key area of assistance, aiming to improve both the quantity and quality of forests through the restoration of degraded lands while also supporting the prevention of soil degradation, the preservation of water and soil conservation functions, and biodiversity conservation. This project, which promotes afforestation and ecosystem conservation in desert regions, also seeks to harmonize with local communities' livelihoods, thus aligning closely with Japan's ODA policy.

[9] To increase the motivation of residents in the target villages at the beginning of the project, small-scale infrastructure development, such as installing drinking water facilities and improving agricultural roads, was carried out. During the creation of the micro plan, the VFPMC and EDC members decided on the activities through discussions.

3.1.2.2 Internal Coherence

This project is the fifth forestry Yen-Loan project in the state[10]. The total afforestation area from the previous four projects is 400,000 hectares. With the 84,000 hectares of afforestation achieved through this project, it can be said that this initiative has contributed to environmental conservation, socio-economic development, and climate change mitigation within the state. In the 1990s, JICA implemented the first afforestation project in India, the "Indira Gandhi Canal Region Afforestation Project" (January 1991) in Rajasthan. During the implementation of the project in 1999, a law regarding JFM was enacted in the state, which led to the introduction of a collaborative management approach with local communities and RFD under the JFM program. According to JICA India, no other donors were funding afforestation projects then, and JICA was the sole organization supporting JFM efforts. Furthermore, in subsequent projects, JICA expanded environmental conservation through JFM, accumulated knowledge, and built practical experience. Afforestation in desert areas, in particular, began with sand dune stabilization, and it takes years—often a decade or more—for trees to mature. This approach presents a challenge as immediate, visible benefits or results are not apparent, making it difficult to increase residents' motivation to participate. One solution was for the executing agency to show the afforested areas from previous projects to the VFPMC to demonstrate that forests could be established even in the desert, explaining the potential benefits and effects. This helped motivate participation. As a result, the VFPMC successfully managed the forest, maintaining a high survival rate, and the residents saw improvements in their lives, such as enhanced sand dune protection, securing groundwater, and providing grazing land and fuelwood. Similarly, groups within the EDC and SHGs incorporated mutual visits between groups conducting similar activities, further improving participation and activity outcomes. These insights were incorporated into the planning of the follow-up project, the "Rajasthan Climate Change Mitigation and Ecosystem Benefit Improvement Project" (L/A February 2024).

This project could only have been realized due to JICA's continuous support. The outcomes of this project have been carried forward into subsequent projects, ensuring a high degree of internal consistency.

[10] The four preceding Yen-Loan projects implemented in Rajasthan include the "Rajasthan Afforestation and Biodiversity Conservation Project"(March 2003), the "Rajasthan Afforestation Development Project"(February 1995), the "Aravalli Mountain Range Afforestation Project"(January 1992), and the "Indira Gandhi Canal Region Afforestation Project"(January 1991). The total funding amounted to 29.2 billion yen, with a total afforestation area of approximately 400,000 hectares.

Photo 3: The afforestation for sand dune stabilization formed under this project, shown alongside its previous condition. Photo 4: A plantation area from a preceding project that has become a stable forested area over approximately 30 years, transforming from the desert. (Photos by the external evaluator)

3.1.2.3 External Coherence

Collaboration with other donor projects was not especially anticipated at the time of the appraisal. However, coordination and collaboration took place during the implementation period, resulting in noticeable outcomes. The conservation efforts for the endangered GIBs, in particular, saw a successful collaboration between the hatchery operated by the World Wide Fund for Nature (WWF) in Jaisalmer District and this project's breeding site conservation activities. This collaboration led to an increase in the GIB population. This success story has been widely shared within the country, and chicks are to be provided to Gujarat and Maharashtra states, where the GIB population was nearing extinction.

In April 2023, the French Development Agency (AFD) also began loan support for a forest management and biodiversity conservation project in eastern Rajasthan. The project plan was developed by the PMU of this project without external assistance for the first time, demonstrating the capacity-building of the executing agency and using the knowledge gained through this project. Furthermore, the collaboration between the follow-up project, "Rajasthan Climate Change Mitigation and Ecosystem Benefit Improvement Project" (L/A February 2024), and the AFD project is expected.

The collaboration that went beyond expectations, such as protecting endangered species and sharing accumulated knowledge, has led to tangible results, indicating a high degree of external consistency.

This project has been consistently aligned with the policies and development goals of the Indian and Rajasthan state governments from the time of appraisal to the ex-post evaluation, as well as Japan's ODA policy at appraisal time. It has addressed various development needs, such as sustainable forest management, balancing biodiversity with people's livelihoods, and contributing

to social development to reduce disparities. The approach to implementing large-scale afforestation has provided insights for similar projects. Furthermore, in the long-term activity of afforestation, there have been synergistic effects with previous projects, and collaboration with other donor projects has become a widely recognized success story, contributing to similar initiatives in different states.

Therefore, its relevance and coherence are very high.

3.2 Efficiency (Rating:③)

3.2.1 Project Outputs

The major components of afforestation activities, biodiversity conservation, and improving local livelihoods were implemented almost as planned. The components where there were differences between the plan and actual implementation include 1) the area planted by type of afforestation, 2) the biological park, and 3) the GPS/MIS facilities and related equipment. An overview of the outputs is shown in the "Comparison of the Original and Actual Scope of the Project" on this report's last page, with detailed information provided in "Attachment 1."

1) Area Planted by Type of Afforestation

The total afforestation area, including desert and non-desert areas, was almost as planned. However, there were changes in the area planted by type, as follows:

- In the desert area, areas initially planned for silvipastoral plantation included terrain with many rocks, so the project target areas were changed to canal-side and block plantation.
- In the non-desert area, 10,000 hectares of fuelwood and charcoal plantation were planned, but due to a lack of interest from VFPMCs, the planted area was vastly decreased to 3,200 hectares (32% of the original plan).
- Due to restrictions on irrigation and water use in the desert area, the plan was for 130 SHGs to grow seedlings as part of agro-forestry. However, only 101 SHGs (78% of the original plan) grew seedlings.

2) Biological Park

The plan at the time of appraisal included the development of one new biological park and improving two existing parks to promote wildlife protection, research activities, educational opportunities, and tourism. From the actual results of the developed or upgraded parks, it became clear that the benefits were significant for the participants and the surrounding communities. The revenue generated from park entrance fees and donations from the area's businesses was sufficient to cover the operational and maintenance costs[11]. As a result, RFD proposed the addition of one

[11] In India, companies that meet certain conditions are required to fulfill their Corporate Social Responsibility (CSR) by donating a certain percentage of their net profit to contribute to the local community. The companies are selecting the recipients of these donations.

more park, which was approved by JICA and incorporated into the project components.

3) Cancellation of GPS/MIS Facilities and Related Equipment

RFD's budget provided GPS facilities and related equipment, so they were removed from the project components. Additionally, data collection activities were canceled because the Rajasthan state system began operations, and the data from this project was incorporated into that system.

3.2.2 Project Inputs

The details are shown in the "Comparison of the Original and Actual Scope of the Project" on this report's last page.

3.2.2.1 Project Cost

The planned and actual project costs are as follows. The total project cost planned at the time of appraisal was 20,515 million yen (of which Yen-Loan: 15,749 million yen and Indian side: 4,766 million yen). The actual cost was 18,988 million yen (of which Yen-Loan: 15,070 million yen and Indian side: 3,918 million yen), within the planned budget.

Although there was no change in the total project cost, due to reallocations from other items, the cost for afforestation and biodiversity conservation activities amounted to 1,481 million yen. As a result of this reallocation, the procedure for amendment of the L/A was carried out.

3.2.2.2 Project Period

The project duration planned at the time of appraisal was from June 2011 to March 2019 (94 months), with the project completion defined by the completion of all activities from signing the Loan Agreement (L/A). The actual duration was from June 2011 to September 2021, totaling 124 months (132% of the planned duration), exceeding the original plan. The delay was primarily due to the selection of members for the PMU after the signing of the L/A, which led to a delay in the start of concrete activities for one year. Additionally, in the latter half of the project, the component for the new biological park was added, and coordination with related agencies, such as the Central Zoo Authority, took longer than expected.

3.2.3 Results of Calculations for Internal Rates of Return

The Economic Internal Rate of Return (EIRR) calculated at the time of the appraisal was 10.24%. Due to insufficient provision of relevant information by the executing agency, it was not possible to recalculate the EIRR.

The outputs of the project were generally implemented as planned. Although there were some modifications, these were thoroughly examined considering the local circumstances and approved by JICA, making reasonable adjustments. Due to delays in securing personnel at the beginning and the need to adjust the scope, the project duration exceeded the initial plan, but the project

costs remained within the planned budget. Therefore, efficiency of the project is high.

Photo 5: Fence installed around the wildlife sanctuary to prevent livestock intrusion. Photo 6: The water drinking basins for animals. The shallow, bowl-shaped design prevents small animals from falling into the water. (Photos by the external evaluator).

3.3 Effectiveness and Impacts[12] (Rating: ③)

3.3.1 Effectiveness

3.3.1.1 Quantitative Effects (Operation and Effect Indicators)

Table 1 presents the indicators defined at the project appraisal, their baseline, target, and actual figures. The operation and effect indicators (A) to (G) were met mainly as planned, with achievement rates ranging from 70% to 100%.

Table 1 Operation and Effect Indicators

Indicators (unit)		Target	Actual	Actual /Target Ratio
		2 years after Completion 2021	2 years after Completion 2023	
(A) Afforestation Area (ha)		83,650	83,650	100%
(B) Survival Rate (%)	Desert Area	Canal Side Plantation 80	58.41	73.0%
		Sand Dune Stabilization 60	63.12	105.2%
		Silvipastoral Plantation 70	64.76	92.5%
		Block Plantation 80	71.11	88.9%
	Non-Desert Area	Rehabilitation of Degraded Forests (I) 70	66.09	94.4%
		Rehabilitation of Degraded Forest (II) 70	65.98	94.3%
		Assisted Natural Regeneration 70	64.77	92.5%
		Fuel Wood Plantation 70	69.36	99.1%
(C) Survival Rate of Agro-Forestry (%)		75	73	97.3%
(D) Number of Protected Areas (Sanctuaries)		7	7	100%
(E) Number of Groups Established and Utilized under the Project (group)		2,730	2,722	99.7%
(F) Number of Training Participants (persons)		100,500	114,506	113.9%
(G) Number of Employment Created by the Project (person/day)		37,000,000	31,530,000	85.2%

Source: Materials provided by JICA; the actual figures are from the questionnaire to the executing agency.

(A) Afforestation Area: While adjustments were made to the target areas and afforestation details, the planned afforestation area was primarily implemented as planned. The details of these adjustments are outlined in the "3.2 Efficiency" section under the output items.

(B) Survival Rate, (C) Survival Rate of Agro-Forestry: The data showing the survival rate for the target year (2023) obtained through the measurement method based on the RFD guidelines (GPS data analysis) is presented. Although the data comes from a sample survey, the afforestation sites visited during the field survey as part of this evaluation have been well managed by VFPMC, which has performed maintenance and supplementary planting. It has been confirmed that there

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

is no significant deviation between the data obtained from GPS measurements. The high survival rate can be attributed to several factors, including on-the-job training (OJT) provided to participants by RFD, the contribution of water and soil conservation facilities to the establishment and survival of planted trees, and VFPMC's diligent maintenance efforts. As a result, the target was achieved even in a desert area with extremely low precipitation. Key factors for this success include Rajasthan's cultural value of protecting forest land and the efforts made by the PMU to increase participation motivation by organizing visits to similar sites.

(D) Number of Protected Areas (Sanctuaries): The project was implemented in seven wildlife sanctuaries as planned. Local villagers, through the EDC, were involved in the construction of fences around the sanctuaries, as well as the development of water basins for wildlife and water and soil conservation facilities. The seven sanctuaries developed under this project are now being used to conserve endangered species, such as the GIB and the four-horned antelope, and to promote eco-tourism[13]. In addition to maintaining the sanctuaries, the EDC has initiated eco-tourism-related businesses, such as tour guiding and operating accommodation facilities and restaurants, thereby generating a stable income.

(E) Number of groups established and utilized under the project, (F) Number of training participants: In implementing the project, local community organizations such as VFPMCs that are responsible for afforestation, EDC focused on wildlife conservation, SHGs, primarily composed of female members within these organizations, were established nearly the planned number. RFD and various NGOs provided training to the organizations. Afforestation and water and soil conservation facility construction were carried out through on-the-job training (OJT), with simple techniques such as supplementary planting and facility maintenance being transferred to the local community. One of the objectives of the SHGs was to create spaces for individuals facing similar challenges to come together. Some groups could also increase their income by utilizing traditional tribal and local techniques to produce and sell handicrafts and forest products.

(G) Number of Employment created by the project: Community organizations such as VFPMC and EDC signed memoranda of understanding (MOUs) with RFD regarding the activity plans, and they participated in tasks such as afforestation and the construction of facilities. The number of employments means the total labor days for these tasks. The project was implemented in remote areas where cash income was initially low. Therefore, the payment for the labor contributed to improving livelihoods and motivated greater participation from the local community organizations. According to interviews with VFPMC leaders, it was difficult to attract participants in the first one to two years after the organization was established. However, once the community members began to receive benefits, such as wages, the number of participants

[13] The International Union for Conservation of Nature (IUCN) classifies the four-horned antelope as Endangered (Category II - increasing risk of extinction) and the GIB as Critically Endangered (Category IB - high risk of extinction in the wild in the near future).

significantly increased, and the community even started organizing rotating shifts to ensure fair distribution of the work.

Column 1: No Longer Needing to Migrate for Work, Leading to More Time with Family
Harilal Raut (Senior VFPMC Member)

We established VFPMC in our village in 2015. At first, there wasn't much interest in participating, mainly because people didn't fully understand the benefits of afforestation and check dams, especially given the low literacy rate in the village. The first members were just 11 people.

Over time, by explaining how the project could bring long-term benefits to the environment and create jobs and how it would allow us to freely use resources that were critical to the village—such as pasture for livestock, feed, firewood, and water for agriculture—more people began to join in. With the visible improvements, about 300 villagers are now part of VFPMC.

Photo 7: Group Interview on Satisfaction Level with the Project

From the forest land, we can now gather firewood for cooking and pasture and feed for the cattle. We also earn income from selling firewood and forest products, and we've even started saving money. We've harvested more firewood, sugarcane, and fruits to sell at roadside stalls.

With the creation of forest land, water channels, and check dams, the groundwater level has risen, positively impacting agriculture and vegetation. This has gone a long way in solving the village's water problems, and as a result, agricultural production has increased. Agriculture was the only source of income in this village, so most people used to migrate to neighboring states for work. But now that agriculture provides enough income, fewer people must leave their families to find work. Spending time with family, especially during the festival season, has become the greatest happiness for the villagers.

3.3.1.2 Qualitative Effects (Other Effects)

The qualitative effects anticipated in the plan at the time of the appraisal included "environmental improvement, biodiversity conservation, improvement in the living standards of residents, enhancement of the social and economic capacities of women, and climate change mitigation." These are considered impacts and will be addressed in the next section under "Impacts."

3.3.2 Impacts

3.3.2.1 Intended Impacts

The project's impacts were focused on "environmental conservation, balanced socio-economic development, and contributions to climate change mitigation" in the target area. Although specific indicators were not initially set, based on the anticipated qualitative effects outlined in the project, the impacts are categorized into (A) Environmental Improvement, (B) Biodiversity Conservation, (C) Improvement in Residents' Living Standards, and (D) Improvement of Women's Social and Economic Empowerment. The analysis of the project's impacts will be conducted based on the following indicators:

(A) Environmental Improvement

Indicators: Increase in the state's forest area, improvement in forest cover, recovery of vegetation, prevention of desertification, water and soil conservation, reduction of soil erosion, and decrease in the utilization of forest resources.

- The forest area in Rajasthan was 32,845.3 km² in 2019/2020[14], and the afforestation carried out under this project covered an area of 836.5 km², contributing to a 2.55% increase in the state's total forest area. This represents 0.24% of the total area of Rajasthan, making a significant contribution to the state's forest cover, which remains below 10% (9.59% in 2019/2020).
- According to RFD, the impact report on climate change adaptation and water resource conservation[15] implemented in Rajasthan indicates that, since the 2016 survey, afforestation efforts have helped prevent the evaporation of moisture, leading to an increase of 17.8 million cubic meters of groundwater storage across the state.
- Interviews conducted in villages in Jaisalmer, located along the Thar Desert, reported several cases where afforestation efforts helped reduce soil erosion in affected areas. This resulted in a decrease in road sand accumulation and dust blowing into the villages.

[14] Rajasthan Forest Department Website (Total Forest area by legal status of Rajasthan) (Accessed May 7, 2024)
[15] the Impact Assessment report of Mukhyamantri Jal Swavlamban Abhiyaan (MJSA)

(B) Biodiversity Conservation

Indicators: Status of vegetation recovery in the target area, changes in wildlife population, changes in livestock intrusion, changes in the population of endangered species, and reduction in human-wildlife conflict incidents.

- The construction of fences around the wildlife sanctuary has successfully restricted the movement of humans and livestock. As a result, vegetation in the breeding areas has recovered, creating nesting sites for the GIB and increasing its population. The population, which had decreased to 40 birds in 2014, has grown to 200.
- The drinking water basins by the project have significantly contributed to the sanctuary's conservation. While there is no data on the changes in the population of the Four-Horned Antelope, sightings have been reported by forest officers and the EDC.
- It is challenging to establish a direct correlation between human-wildlife conflict and this project. The capture of leopards that appeared in the village and the protection of peacocks injured in traffic accidents are managed by RFD forest officers and the wildlife park, but these remain ad-hoc responses.

(C) Improvement in Residents' Living Standards

Indicators: Income from the sale of seedlings, services at the wildlife park, eco-tourism, and sale of forest products.

- The target area of the project consisted of villages inhabited by designated tribes and castes, located far from urban areas, where livestock grazing and agriculture were the primary sources of income. Implementing the project generated income from activities like afforestation and dam construction and created employment opportunities for the maintenance and management of the biological parks.
- New businesses have emerged in the biological parks, such as eco-tourism, rickshaw (three-wheeled taxi) services, and the operation of restaurants and cafes. With the increase in visitors to the park, the target villages and areas surrounding the parks have seen new restaurants and shops opening. Additionally, the demand for rickshaw drivers to transport visitors from the city to the park has grown, contributing to the development of the local economy.
- The production and sale of handicrafts and processed forest products by SHGs, once fully operational, have provided not only temporary income but also a sustainable source of revenue.
- Interviews during field surveys revealed that groundwater sources have been created because of afforestation and the construction of water and soil conservation facilities, leading to improved agricultural production and a more stable income. This has reduced the need for migration to urban areas for work, allowing individuals to spend more time with their

families.

- As forest products, afforestation has made collecting more firewood from the forest possible than needed for personal consumption. Additional income has been generated by collecting firewood and selling it at roadside stalls.

(D) Improvement of Women's Social and Economic Empowerment

Indicators: Participation of women in employment and training and participation of women in community organizations.

- Of the total employment generated by the project, 6.3 million persons/days were for women (approximately 20%).
- According to the project implementation guidelines, to ensure the fair inclusion of women's perspectives, a requirement was established that at least 30% of the members of VFPMC/EDC be women. During field surveys, the committee members interviewed confirmed that women made up over 30% of the board members, in line with this guideline. However, in some villages, cultural practices persist, such as women not being allowed to speak freely in front of men and women still covering their faces with scarves when meeting outsiders.
- According to interviews with women in EDCs and SHGs, their regular income has enabled them to have a say in household finances and decisions regarding their children's education. They also reported that the increase in income allowed them to save assets, such as gold, and helped them manage the rising cost of living. Some women proudly showed off their new gold jewelry, saying that the steady income had stabilized their household finances and enabled them to afford such purchases.
- Traditionally, women are responsible for household cleaning, collecting firewood, and herding livestock. During the field surveys, women reported that established forests had reduced the amount of dust, leading to less frequent cleaning. Additionally, while collecting firewood or herding livestock used to take several hours and was often done far from the village, the creation of nearby forests saved time, allowing women to spend more time with their children.

(E) Mitigation of Climate Change

Indicators: Contribution to the sequestration of greenhouse gases (GHG).

- The appraisal plan projected that the project would contribute to the sequestration of approximately 480,000 tons of CO^2 equivalent per year. Due to the lack of detailed data on the afforestation area by region at the time of the ex-post evaluation, it was impossible to recalculate using the same method as in the appraisal. However, since the afforestation and the establishment of protective fencing, which were expected to contribute to GHG

sequestration and forest conservation, were carried out on nearly the planned scale, it can be concluded that the expected outcomes have been largely achieved.


Photo 8: Interview with VFPMC, Photo 9: Cotton Fabric Production by SHG (Photos by the external evaluator)

3.3.2.2 Other Positive and Negative Impacts

1) Impacts on the Environment

The project was classified under the Environmental and Social Considerations Category (FI) according to the *International Cooperation Guidelines for Environmental and Social Considerations* (established in April 2002). This was because, prior to the loan approval, the subprojects could not be identified, and it was anticipated that such subprojects could have potential environmental impacts. However, given that the project involved afforestation and biodiversity conservation activities, and considering the scale and expected nature of the subprojects, no significant negative environmental impacts were anticipated.

In the afforestation activities, the use of pesticides and chemical fertilizers was prohibited, and organic fertilizers were used instead. Additionally, electric vehicles were used for the rickshaw business in the nature reserves, ensuring minimal ecological impact, as confirmed during the field survey. According to RFD, no adverse environmental effects resulted from the afforestation, ecosystem conservation, or handicraft activities conducted by SHGs as part of the project.

2) Resettlement and Land Acquisition

Since this project involved afforestation on forest lands owned by RFD and ecosystem conservation activities at the wildlife reserve, it did not require land acquisition or the resettlement of residents.

3) Gender Equality

As noted in the impact section under "(D) Improvement of Women's Social and Economic Empowerment," it has been reported that the project created 6.3 million persons/day of employment. The regular income earned by women contributed to their empowerment, enabling them to have a say in household finances and decisions regarding their children's education.

Additionally, the development of nearby forests led to reduced dust, decreased the frequency of cleaning and allowed women to save time because they no longer spent hours herding livestock.

4) Marginalized People

In selecting the target villages for this project, factors such as poverty rates and the proportion of designated tribal populations were considered. The plan was to implement livelihood improvement activities, including eco-tourism, for communities with a high dependence on forest resources. In addition to these factors, villages located in areas with harsh climates and those near wildlife reserves or animal parks were chosen for implementation. The residents of these villages had limited employment opportunities, and their primary sources of income, such as livestock grazing and agriculture, were unstable. Through this project's implementation, they could secure regular income.

Column 2: Pride in the Success of the Rickshaw Business

Photo 10: EDC members working in uniforms.

Kanaram Meena (President of EDC Khurad)

In June 2016, five members started the activities of the Khurad EDC at Nahargarh Wildlife Park. At first, we focused on tasks like cleaning the park, promoting environmental education, and eliminating plastic products. But the introduction of electric rickshaws became a turning point for us.

We initially took out a loan to purchase five rickshaws, and over time, both the number of rickshaws and members increased. Now, we have 31 rickshaws running. Although we already had driving skills, we learned eco-tourism know-how through the JICA project.

The success of the rickshaw business has provided us with a steady income, and as a result, our children can now attend schools in town and receive a quality education. After work, I buy cookies or small treats for my children. Seeing their happy faces when I come home has become one of the greatest joys of my day.

The success of the EDC has also spread to neighboring villages, and as a result, our village's social standing has risen. As proof of this, we've even received marriage proposals from distant families seeking connections with us, and I am very proud of that. The rickshaw business will be passed down to my children as well.

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

In this ex-post evaluation, a well-being survey focused on the participants' happiness and

satisfaction with their lives was conducted[16]. In addition to the improvements in the lives of residents, as shown in the impact section, interviews from the survey revealed several positive outcomes. For example, as mentioned in Column 1, participants no longer needed to migrate for work and could spend the festival period with their families. As described in Column 2, the improved reputation of the village led to better marriage prospects. These factors demonstrate how the project has contributed to increased happiness and enhanced social status in the community.

6) Unintended Positive / Negative Impacts

RFD has established a strong relationship with the target villages in implementing this project. RFD forestry officers frequently visited the villages not only to oversee the implementation of the project but also to provide support for the safety and livelihoods of the residents. This consistent engagement has fostered mutual trust. As a result, the villages have become more proactive in supporting the RFD's activities, including providing information on poachers and the appearance of dangerous animals and cooperating in early detection and initial firefighting efforts for forest fires.

As mentioned above, the project has resulted in effects exceeding the initial plans, demonstrating high effectiveness and impact. In addition to the operational indicators largely meeting the targets, the project has significantly contributed to environmental conservation and balanced socio-economic development in the target areas. Furthermore, the emphasis the executing agency places on building trust with local communities has been a key factor in successfully advancing the participatory approach.

Photo 11: Rickshaw operating in Biological Park, Photo 12: Sajangah Biological Park (Photos by the external evaluator)

[16] The evaluation was conducted to assess the target project in terms of achieving the indicators and target values set during the appraisal and capturing the positive and negative impacts on the beneficiaries' lives from a multi-dimensional perspective. While specific effects were not anticipated as direct outcomes of the project, the evaluation also focused on secondary effects that emerged due to the project and the long-term impacts of these outcomes. From this perspective, individuals and groups who were capable of providing detailed insights were identified in advance, and interviews were conducted with five groups and four individuals.

3.4 Sustainability (Rating: ④)

3.4.1 Policy and System

At the 26th Conference of the Parties to the UN Framework Convention on Climate Change (COP26) in 2021, Prime Minister Modi introduced the *Lifestyle for Environment (LiFE) initiative*, aiming to encourage consumers and citizens to adopt behavior changes and promote environmental protection and sustainable lifestyles based on traditional ecological values.

The Ministry of Environment, Forest, and Climate Change of India established the *Green Credit Program* in 2023 to further support climate change measures. 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, and support sustainable building and infrastructure activities.

Rajasthan State seeks to promote sustainable forests, wildlife protection, and biodiversity conservation based on scientific, traditional, and experiential knowledge through its forest policy. The state is committed to achieving a comprehensive balance of ecological, economic, and social well-being, to increase the vegetation rate by 20% by 2050, including land areas outside of forested regions.

Given this, it can be said that the policies and systems for advancing afforestation and biodiversity conservation are well-established and will continue to develop.

3.4.2 Institutional/Organizational Aspect

1) Executing Agency

The executing agency, RFD, is a division of the state government responsible for planning and executing forestry and wildlife conservation activities. The afforestation and ecological conservation activities of this project involved 27 Divisional Management Units[17] (DMUs: local management offices at the level of forestry districts and wildlife protection areas) and 81 Field Management Units (FMUs: site management offices at the level of forestry offices), where forest officers were engaged as part of their core duties. At the time of ex-post evaluation, site monitoring and support for local community organizations continue. Additionally, forest lands across the entire state are monitored by the Monitoring and Evaluation Department of RFD.

An independent public entity, PMU, was established to implement the project. Operating independently from the Forestry Department, PMU has its operational regulations covering finance, accounting, human resources, management standards, and more. The staff includes personnel from RFD and externally hired experts, such as a Senior Project Manager, specialists in biodiversity conservation, joint forest management, marketing, project monitoring and evaluation, and public relations.

[17] Due to the addition of the construction of one biological park as a component change in this project, the number of offices equivalent to DMUs, which was 27, increased to 28 by the completion of the project.

After the project's completion, PMU was downsized but remained operational to manage subsequent projects funded by JICA and other donors. The number of staff is expected to increase as subsequent projects begin. During the interim period, RFD provided budgetary support for PMU's staff salaries and activities.

The establishment of PMU was the first trial for RFD, and rather than disbanding after the project's completion, it continued to preserve the knowledge and expertise developed during the project. In April 2023, a similar project funded by AFD began, with PMU managing the project planning and execution without relying on external assistance. Government employees typically transfer every few years, but having a specialized organization like PMU ensures continuity between projects.

2) Community Organizations

The community organizations involved in the project, including VRMPCs, EDCs, and SHGs, continued their activities after the project's completion. Forest officers assigned to each area provide these organizations with ongoing monitoring and technical support. This information is then reported to DMUs. Some community organizations also maintain connections with NGOs that provided technical support during the project, continuing to collaborate for marketing purposes.

The organizational structure for implementing the project is well-established, with monitoring and support for community organizations incorporated into the regular duties of the forest officers. PMU also continues to operate, sharing its knowledge for subsequent project development. As a result, the community organizations have continued their activities in the same manner as during the project's implementation. Therefore, there are no concerns regarding the organizational or structural aspects of the executing agency and community organizations.

3.4.3 Technical Aspect

1) Executing Agency

RFD had experience implementing four previous Yen-Loan projects at the time of appraisal. Although there were delays in the first project, the "Indira Gandhi Canal Region Afforestation Project," the subsequent three projects progressed smoothly, and the ex-post evaluation results were generally favorable. For this project, various training programs were conducted to enhance the capacity of both senior staff and field forest officers in community-based forest management and biodiversity conservation activities. Additionally, consultants were employed for project management, and there were no concerns about technical implementation capacity.

At the time of ex-post evaluation, the following training systems and recruitment criteria were in place, and no significant issues were observed:

RFD's training facility, the Rajasthan Forestry & Wildlife Training Institute, provides technical training to existing staff and the newly hired. There are 15 types of courses, including forest

management, relevant regulations, community-based joint forest management, ecology and environment, and eco-tourism. Staff members are required to take classes according to their job responsibilities.

RFD's recruitment criteria for forest officers require at least a university degree in science. In recent years, the number of applicants has increased due to the stability of civil service jobs, which offer job security until retirement and pensions. As a result, the competitive ratio has risen from 100 to 10,000 applicants for each position, allowing RFD to attract highly qualified personnel. RFD also emphasizes understanding local culture and language in the recruitment process, as establishing trust with local communities is crucial for successful community-based afforestation and biodiversity conservation activities. Since RFD lacks expertise in marketing, product development, and technical guidance for handicrafts, these areas are complemented through collaboration with other state departments and NGOs.

2) Community Organizations

In this project, strengthening the capacity of community organizations such as VFPMCs, EDCs, and SHGs was essential. As such, various training programs related to forest and conservation management were planned with the support of NGOs. In practice, however, afforestation techniques were transferred through on-site training provided by the PMU and forest officers. Monitoring and additional guidance by the forest officers have continued even at the time of ex-post evaluation. VFPMCs acquired the necessary basic knowledge and skills for afforestation, which has allowed villagers to, for example, plant trees on their land. Since RFD provides saplings to villagers at affordable prices, this could lead to spontaneous afforestation activities.

In this project, PMU organized and conducted mutual visits between community organizations involved in similar projects. The purpose was to encourage learning from similar projects and promote participation. For instance, the EDC from Chittorgarh Wildlife Sanctuary visited Sajjangarh Wildlife Park and learned eco-tourism skills, including animal care, maintenance methods, rickshaw taxi operations, and tourist guide services. Similarly, VFPMCs and SHGs also participated in exchange visits. When technical transfer to SHGs was required in areas where RFD lacked expertise, it was entrusted to NGOs.

As shown above, the executing agency has a system in place for updating the skills of forest officers, and recruitment standards have been established. Various training sessions were conducted for community organizations according to the on-the-ground activities during project implementation, and no significant technical issues have been observed.

3.4.4 Financial Aspect

1) Executing agency

At the time of appraisal, it was determined that no financial issues had arisen with the executing agency in past Yen-Loan projects. Additionally, it was noted that the project funds for this

initiative were expected to be appropriately allocated from the fiscal year 2011 onwards, with no significant concerns regarding the financial aspects.

The budget and expenditure for RFD over the past three fiscal years are shown in Table 2 below. According to interviews with RFD and the PMU, it was confirmed that adequate budgets have been allocated for the operation and maintenance of this project.

Table 2: RFD Budget and Expenditure (unit: 100,000 Rupees)

FY	Budget	Expenditure	Budget Execution Rate
2020/21	50,122.48	38,454.72	76.7%
2021/22	69,623.07	61,403.78	88.2%
2022/23	82,830.9	72,657.81	87.7%
2023/24	122,246.18	72,296.61*	59.1%

Source: Annual Report of Rajasthan Forest Department
*Expenditure for the fiscal year 2023/24 as of December 2023

2) Community Organizations

According to the plan at the time of the appraisal, the government established a Corpus Fund, designated for the maintenance and management costs of the plantation areas managed by the VFPMCs and for maintaining facilities such as fences set up by EDCs through the project. The maintenance of small-scale infrastructure, such as water basins, developed through livelihood improvement activities, was to be the continued responsibility of RFD.

According to the executing agency, the Corpus Fund was established as planned, and operating and maintenance budgets were allocated to VFPMCs and EDCs. Adequate amounts have been allocated for maintenance; therefore, there are no particular concerns regarding financial aspects. The fund management is handled by the accounting staff of each organization, who are responsible for maintaining the ledgers and bank books. Transparency and fairness are ensured through regular meetings, during which the balance is verified in the presence of the RFD's forest officers.

Some organizations have launched businesses from the activities of this project and are now self-sustaining. While it was not possible to verify all 2,700 participating organizations, below are some examples from the field hearings during the site visits:

VFPMCs: During the project implementation, wages, materials, and seedlings were provided by the project. After the project's completion, RFD supports any necessary replanting, providing seedlings. Maintenance of structures like dams requires minimal effort, such as cleaning; therefore, maintenance costs are very low. Forest products can now be sold and used for self-consumption, which has contributed to stabilizing the members' income.

EDCs: Even after the project’s completion, EDCs continue to receive a stable income from the maintenance of the protected areas and animal parks, as well as from the businesses it established,

such as the rickshaw taxi service, restaurant operation, and tour guide. There are plans to increase the number of rickshaws in the future.

SHGs: Each participant deposits 250 rupees per month into the SHG account, and RFD provides an annual revolving fund of 50,000 rupees, which is used to purchase necessary equipment and materials for activities. A successful case is the Jaipur-based SHG, which has become self-sustaining by selling the cotton fabric it produces. The SHG is now able to cover its costs for materials and expenses.

3.4.5 Environmental and Social Aspects

In this project, no adverse environmental impacts were anticipated at the time of the appraisal and implementation. No such cases were observed retrospectively.

3.4.6 Preventative Measures to Risks

In recent years, changes in climate patterns have led to unexpected heavy rainfall during the monsoon season, resulting in flooding in areas that were not previously prone to such events. While no significant damage has been reported at the project sites, adaptive measures, such as increasing the extent of afforestation, are being implemented to mitigate these impacts.

3.4.7 Status of Operation and Maintenance

Due to the limitations of the scope of the ex-post evaluation, it was not feasible to visit all the project sites. However, site visits were conducted to representative locations. The operational and maintenance status of the afforestation sites, soil and water conservation facilities, wildlife sanctuaries, and biological parks were assessed as follows, and it can be stated that all are in good condition:

Afforestation Sites: The visited sites are maintained by VFPMCs, and the planted trees have high survival rates. Interviews with the VFPMCs revealed several direct benefits, such as providing shade and sand protection, reducing the need for villagers to travel far for firewood and grazing, and increasing agricultural yields due to groundwater availability.

Soil and Water Conservation Facilities: No significant issues were observed. The soil and water conservation facilities constructed under the project are simple and involve stacking stones and digging holes. Since the VFPMC provided labor during construction, they understand the structures and can perform appropriate repairs and maintenance. The concrete dams require only basic cleaning for maintenance.

Wildlife Sanctuaries and Animal Parks: No significant issues were observed in the visited wildlife sanctuaries and biological parks. Since they are a part of RFD, their operation and maintenance responsibilities lie at RFD. The EDC members are contracted by RFD for various tasks, earning wages from construction work during the project phase and maintenance and

cleaning tasks afterward. Some EDC members have also launched eco-tourism ventures, including guiding services, rickshaws, and cafeterias for park visitors. This project has provided employment opportunities in previously remote designated tribes/castes villages with very little local employment. Some EDC members, such as those from the GIB Conservation and Nahargarh Biological Park, have successfully started eco-tourism businesses and are expected to continue their self-sustaining by acquiring their own vehicles and equipment and fostering successors.

Meeting Halls: One concrete building constructed as an entry-point activity to increase community participation was inspected, and no significant issues were found. Maintenance activities such as cleaning and repainting of the window grills have been carried out.

GIS/MIS Labs and Related Facilities: While not directly funded by the project, the GIS/MIS facilities have been used to verify the vegetation and survival rates of planted areas and to plan pre-plantation site assessments. A central monitoring room has been established at the project headquarters. High-performance cameras (with a range of 2-3 kilometers and features such as image enlargement, night surveillance, and motion tracking) have been installed at 52 locations within the state. These cameras provide concentrated monitoring of images, which are used for wildlife surveillance, anti-poaching efforts, and monitoring of forest fires. In the case of fire detection, a system sends alerts to both forest officers and the VFPMC, allowing for forest checks and initial firefighting responses.

Based on the above, the operation and maintenance of this project are well-supported by the relevant policies, systems, organizational structures, technical aspects, and financial conditions. The afforested areas, soil and water conservation facilities, wildlife protection areas, and biological parks established under this project are properly managed and maintained. No adverse environmental or social impacts have been observed, and adequate consideration has been given to vulnerable communities. No risks have been identified, either. Therefore, sustainability of the project effects is very high.


Photo 13: Concrete dam for soil and water conservation, Photo 14: Irrigation canal (Photos by the external evaluator)

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The objective of this project is to strengthen forest management, enhance biodiversity conservation, and improve the livelihoods of local communities through afforestation and biodiversity conservation activities under a JFM approach, thereby contributing to environmental conservation and balanced socio-economic development and climate change mitigation of Rajasthan in northwestern India.

The project's relevance and coherence are very high. From the time of project appraisal to the ex-post evaluation, it was aligned with the policies and development objectives of both the Indian and Rajasthan state governments. It addressed various development needs, such as sustainable forest management, balancing biodiversity with people's livelihoods, and contributing to social development through poverty reduction. Synergy with previous and similar projects has been evident in the long-term activities of afforestation. Collaboration in the conservation of endangered species has been widely recognized as a successful model and has contributed to similar projects in other states. Regarding efficiency, the project was largely implemented as planned, except for some modifications to its scope. While the project duration exceeded the original plan due to establishing the implementation structure and adjusting the additional scope, the project costs remained within the planned budget. Thus, efficiency is high.

Effectiveness and impact are high. The quantitative targets are generally achieved, while expected impacts are identified. Additionally, its contribution to improving the satisfaction level of life and happiness has been observed. This success can be attributed to the executing agency's emphasis on building trust with local communities in the target areas while implementing participatory activities.

Sustainability is very high. In addition to the policies and systems, the executing agency and the community organizations that participated in the project have secured structures, technical

capacity, and budgets for continuing operation and maintenance. No significant risk that could undermine the project effects was 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

NGO Selection Process and Optimization of Outsourcing Methods

The project was designed to have NGOs provide guidance and support for community-based development and livelihood improvement activities. NGOs that could provide appropriate guidance and support have contributed to the community groups' sustainable activities and income improvements. However, some low-quality NGOs lacked the necessary skills for guidance or engaged in malpractice, such as altering information. PMU terminated contracts with the underperforming NGOs. Instead, RFD forest officers took over the support for the community groups. Based on these lessons, RFD has established a more robust process for selecting NGOs for new projects. This includes conducting the selection process through competitive bidding, thus avoiding contracting with problematic NGOs. Furthermore, RFD forest officers are tasked with monitoring the work assigned to NGOs, ensuring it is carried out correctly. Payment to NGOs becomes performance-based, meaning that payments are made according to the achievement of specific outcomes.

When external organizations such as NGOs are contracted to provide technical training to participants, it is essential to thoroughly assess the organization's capabilities before awarding the contract. Additionally, a system should be implemented to verify the outcomes of the work and ensure that payments are made based on those results.

The Importance of Building Relationships in Community-Based Joint Forest Management

The target area of this project was a remote region that had not received much support from other government agencies, and the forest land involved was vast. Given these conditions, the cooperation of community organizations was indispensable to smoothly advancing the project. Therefore, the executing agency focused on building good relationships with these community groups.

The forest officers responsible for the villages in the target areas not only carried out their primary

duties, such as guiding afforestation efforts, monitoring forest lands, and addressing issues like poaching and the capture of dangerous animals like leopards, but they also provided community support in other ways. For instance, in remote areas with limited transportation options, they helped deliver medicines to the residents and assisted in other aspects of daily life.

Frequent visits by RFD forest officers to the villages helped build trust between the authorities and the local community. In turn, the villages became more involved in supporting RFD's operations, such as providing information about poachers or sightings of dangerous animals, cooperating in early wildfire detection, and assisting with initial firefighting efforts.

Considering the diverse climate characteristics within Rajasthan and the various regional and tribal differences, the forest officers were selected based on their ability to understand local needs. For instance, local recruits who spoke the regional dialect were chosen to ensure smooth communication with the community.

In a community-based joint forest management project, the trust between the executing agency and community organizations is a critical factor for achieving effective outcomes, and it should be given high importance.

5. Non-Score Criteria

5.1 Additionality

JFM started in India in the 1990s as an innovative approach to afforestation and forest management. Before JFM, RFD managed forest lands by excluding people and livestock, protecting forests through restriction. In contrast, JFM empowered local communities to take responsibility for forest management, encouraging afforestation and sustainable maintenance of these lands. At that time, the Indian government lacked sufficient funds to promote JFM, and few donors were willing to invest in afforestation efforts. JICA, however, was the only entity that supported the JFM concept and provided funding. As a result, JFM has since spread across India.

JICA’s support was timely and played a catalytic role in promoting the forest sector in India, contributing significantly to the development of sustainable forest management practices.

(End)

Comparison of the Original and Actual Scope of the Project

Item	Plan	Actual
1. Project Outputs		
(1) Afforestation	83,650 ha	As planned
of Desert Area	56,650 ha	52,250 ha
of Non-Desert Area	27,000 ha	31,400 ha
(2) Agro-forestry	Raising seedlings by SHGs	Almost as planned
(3) Water Conservation Structures	Water Conservation Structures	As planned
(4) Biodiversity Conservation	Wildlife Conservation, Biological Parks development and improvement	As planned
(5) Poverty Alleviation and Livelihood Improvement	SHG mobilization and promotion of the activities, development of Eco-Tourism sites	As planned
(6) Institutional Capacity Development	Capacity development of RFD staff	Almost as planned
(7) Community Mobilization	VFPMCs/EDCs formation and promotion of the activities	Almost as planned
(8) Project Management	Facility/vehicles, Audit, and Review meetings	Almost as planned
(9) Monitoring and Evaluation	GIS/MIS facility/ Equipment and operation	Cancelled
	Baseline survey/ Mid-term Evaluation/Terminal Evaluation	As Planned
2. Project Period	June 2011‐March 2019 (94 months)	June 2011‐September 2021 (124 months)
3. Project Cost		
Amount Paid in Foreign Currency	JPY 768 million	JPY 7,763 million
Amount Paid in Local Currency	JPY 19,746 million (INR 11,093 million)	JPY 11,226million (INR 6,641 million)
Total	JPY 20,515 million	JPY 18,989 million
ODA Loan Portion	JPY 15,749 million	JPY 15,070 million
Exchange Rate	INR 1.00 = JPY 1.78 (As of November 2010) Note: Due to rounding, the total may not match.	INR 1.00 = JPY

		1.6903 (Average between April 2011 and March 2022)
4. Final Disbursement	October 2021	

Attachment 1: Planned and Actual Project Outputs

1. Afforestation

Package 1: Afforestation		Unit	Plan	Actual
Afforestation Total		ha	83,650	83,650
Desert Area	Desert Area Total	ha	56,650	52,250
	Canal Side Plantation	ha	1,650	2,475
	Sand Dune Stabilization	ha	25,000	25,000
	Silvipastoral Plantation	ha	25,000	17,000
	Block Plantation	ha	5,000	7,800
Non-Desert Area	Non-Desert Area Total	ha	27,000	31,400
	Rehabilitation of Degraded Forests-I	ha	6,000	8,000
	Rehabilitation of Degraded Forests-II	ha	6,000	13,000
	Assisted Natural Regeneration	ha	2,500	4,200
	Productivity Enhancement Operations	ha	2,500	3,000
	Fuel Wood Plantation	ha	10,000	3,200

Package 2: Agro-Forestry		Unit	Plan	Actual
Desert/Non Desert Area	Raising seedlings by SHGs	group	130	101
	Training to SHGs	group	130	86

Package 3: Water Conservation Structures		Unit	Plan	Actual
Anicut Type-2 Desert Area	Anicut [18] construction Type-1	place	600	600
	Anicut construction Type-2	place	400	400
	Check Dams	m^3	200,000	200,000
	Contour Bunding	Rmt	500,000	500,967
	Slit Detention Structure	place	300	300
	Gabion Structure	place	500	500
Desert/Non Desert Area	Percolation Tank	place	700	700
	Renovation / Restoration of traditional water harvesting structure	place	200 1,000	200 1,000

2. Biodiversity Conservation

Package 4: Biodiversity Conservation		Unit	Plan	Actual
DLT[19]	DLT Works	ha	12,000	12,000
Wildlife Conservation	Development of Water Points	place	100	100
	Closure for Biodiversity Conservation	ha	5,000	5,000
	Fence for the Four Horned Antelope Conservation	ha	810	810
	Establishment of the Great Indian Bustard Protected Area within the National Park.	site	1	1

[18] A dam for collecting rainwater. The stored rainwater is infiltrated into the ground.
[19] Drainage Line Treatment

Biological Park	Development of Biological Park (Machia, addition: Abheda)	place	1	2
	Improvement of Biological Park (Nahargarh and Sajangah)	place	2	2

Package 5: Poverty Alleviation and Livelihood Improvement		Unit	Plan	Actual
Poverty Alleviation and Livelihood Improvement	Number of SHGs formed	group	1,950	1,957
	Mobilization o SHG	group	1,950	1,637
	Livelihood Improvement Activities	group	650	450
	Technical Training for SHG members[20]	Nos	390	9
Development of Eco-Tourism sites	Development of Ecotourism sites	site	7	7
	Support for Marketing and Value Addition	Implemented by RFD staff according to the needs		

Package 6: Institutional Capacity Development		Unit	Plan	Actual
Capacity Development	VFPMC members	group	1,300	1,291
	Training for NGOs	Nos	6	7
	Village Level Workers[21]	Nos	26	0
	Forest Guards/ Cattle Guards	Nos	54	64
	Range officers/ACFs[22]	Nos	6	6
	DCFs[23] and equivalent	Nos	2	2
Study Tour	Project Personnel	Nos	6	6
	VFPMC members	Nos	12	12
	Overseas Study Tour[24]	Nos	10	Canceled
	Overseas Training of Officers	Nos	20	4
	Technical Cooperation with Other Countries	Nos	N/A	N/A
Research	Research Activities on Indigenous tree/herbal plants	ha	200	115
Technology Extension & Adoption	Extension Camps / Field Visits	Nos	1,400	1,241
	Training to Officer/ GIS Staff	Nos	200	N/A

Package 7: Community Mobilization		Unit	Plan	Actual
Community Mobilization	VFPMCs/EDCs Formation	Nos	650	650
	Development of Microplanning	Nos	650	650
	Entrée Point Activities	Nos	650	1,255
	Construction of VFPMCs/EDCs Meeting Center	Places	650	594
	NGO Support	Nos	650	588
CET[25] Activities	Awareness Camps	Nos	650	608
	Workshops and Seminars at DMU	Nos	135	112

[20] The number of trainings for SHG members was significantly lower than planned. This was due to the selection of activities that utilized skills already possessed by the members, making additional training unnecessary.
[21] Marged to Forest Guards/ Cattle Guards training.
[22] Assistant Conservator of Forests
[23] Deputy Conservator of Forests
[24] Among the study tours, the overseas training was canceled because permission from the state government was not granted.
[25] Communication Extension and Training

	Level			
	General Publicity (Newsletter[26])	N/A	N/A	10 times

3. Project Operation and Management

Package 8: Project Management		Unit	Plan	Actual
PMU	Purchase of PMU Vehicle	unit	3	3
	Construction of PMU Office and Renovation	place	1	1
Audit	PMU Office (annual)	place	1	1
	DMU Office[27]	place	27	28
	VFPMC	group	650	N/A
Review Meeting	Review Meeting	Nos	N/A	12
	Annual General Meeting of PMU	Nos	N/A	4
	High Power Committee Meeting	Nos	N/A	5
	Governing Body Meeting	Nos	N/A	18

Package 9: Monitoring and Evaluation		Unit	Plan	Actual
GIS/ MIS	Establishment of GIS Center at Regional Level	Place	Canceled	
	Procurement of GIS Equipment, including Training by the provider	Nos	130	N/A
	GPS Data Collection		Canceled	
	Procurement of Satellite Images			
	Procurement of Additional Data from other Resources			
	Development and maintenance of customized GIS/MIS applications to monitoring the project area			
	Expenses of GIS Related Outputs			
Studies, Evaluation	Baseline Survey	village	100	100
	Mid-Term Evaluation	Nos	1	1
	Terminal Evaluation	Nos	1	1

Package 10: Contractual Personnel for PMU		Unit	Plan	Actual
PMU	PMU Contractual Personnel	Nos	16	16
	PMU Contractual Personnel through Service Provider	Nos	585	279

[26] Quarterly newsletters on the project from 2016 to 2018, News Letters (rajasthan.gov.in)

[27] The number of audits increased due to establishing the Abheda Biological Park, and the number of offices equivalent to DMU increased to 28.