Ex-Post Project Evaluation 2013:
Package I-3
(India, Sri Lanka, Bangladesh)

December 2014

JAPAN INTERNATIONAL COOPERATION AGENCY

IC NET LIMITED

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Preface

Ex-post evaluation of ODA projects has been in place since 1975 and since then the coverage of evaluation has expanded. Japan's ODA charter revised in 2003 shows Japan's commitment to ODA evaluation, clearly stating under the section "Enhancement of Evaluation" that in order to measure, analyze and objectively evaluate the outcome of ODA, third-party evaluations conducted by experts will be enhanced.

This volume shows the results of the ex-post evaluation of ODA Loan projects that were mainly completed in fiscal year 2011, and Technical Cooperation projects and Grant Aid projects, most of which project cost exceeds 1 billion JPY, that were mainly completed in fiscal year 2010. The ex-post evaluation was entrusted to external evaluators to ensure objective analysis of the projects' effects and to draw lessons and recommendations to be utilized in similar projects.

The lessons and recommendations drawn from these evaluations will be shared with JICA's stakeholders in order to improve the quality of ODA projects.

Lastly, deep appreciation is given to those who have cooperated and supported the creation of this volume of evaluations.

December 2014

Toshitsugu Uesawa
Vice President
Japan International Cooperation Agency (JICA)

Disclaimer

This volume of evaluations, the English translation of the original Japanese version, shows the result of objective ex-post evaluations made by external evaluators. The views and recommendations herein do not necessarily reflect the official views and opinions of JICA. JICA is not responsible for the accuracy of English translation, and the Japanese version shall prevail in the event of any inconsistency with the English version.

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JICA's comments may be added at the end of each report when the views held by the operations departments do not match those of the external evaluator.

India

Ex-Post Evaluation of Japanese ODA Loan Project

"Chhattisgarh Sericulture Project[1]"

External Evaluator: Ryujiro Sasao, IC Net Limited

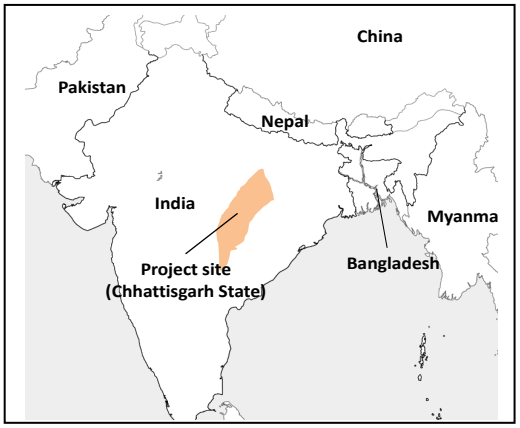
0. Summary

This project aimed to increase the production of tasar silk[2] in the State of Chhattisgarh through the development of the sericulture infrastructure and the provision of technical guidance to sericulture farmers, thereby contributing to employment creation and poverty reduction for the poor (especially women).

Because the implementation of this project is sufficiently consistent with the Indian Government's development plan, the target site's development needs and Japan's aid policy, its relevance is high. Silkworm feed trees were planted as planned initially. Regarding the initially estimated impacts, such as employment creation and an improvement in the standard of living of the poor, although each of the production of seeds[3], cocoons, silk yarn and spun yarn are lower than initially planned, many poor women are able to work in sericulture and their standard of living is improving. Therefore, it can be judged that the effectiveness and the impact are fair. The efficiency is also fair, because the project costs were within the plan, while the project period was longer than planned. Although the operation and maintenance of this project is stable in terms of organization and personnel, there are problems in the technical and financial aspects. Therefore, the sustainability of the effects produced by this project is fair.

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

1. Project Description



Project Location

Silkworm Seed Station Established under The Project

[1] Although the title of this project was "Madhya Pradesh Sericulture Project" at first, the region that includes the site covered by this project separated from the State of Madhya Pradesh and became independent as the State of Chhattisgarh in December 2000, the title was changed accordingly.

[2] Four types of silkworm for sericulture exist in India: tasar, mulberry, muga, and eri. Tasar silkworms eat the leaves of trees such as Terminalia tomentosa and Terminalia arjura, and are reared outdoors.

[3] This means silkworm eggs.

1.1 Background

Sericulture was introduced into India during the prehistoric age. Recently, it has drawn attention as a rural household industry contributing to employment creation and poverty reduction, and the Indian Government has strived to develop it. The production of raw silk sharply increased from about 2,300 tons in 1970 to about 14,000 tons in 1995, which accounted for 13% of the world's total production (99,000 tons) (according to the statistics in 1994)[4]. In the meantime, India received much development assistance to increase the production and improve the quality. With the assistance of the World Bank and others, India carried out the Karnakata Sericulture Project (1980), the Tasar Sericulture Project (1981), which covered several states, and the National Sericulture Project (1989). Japan also has given assistance to India for a long time. Japanese experts have given technical guidance since the 1960s, and Japan gave project–type technical cooperation to the Central Silk Board's laboratory in the State of Karnataka in carrying out its plan to develop bivoltine sericulture technology since fiscal year (FY) 1991[5].

The former State of Madhya Pradesh, where the target site of this project is located, is one of the poorest states in India. In FY1991, 60.1% of the state population was below the poverty line[6] (28.9% for the whole of India)[7]. The state economy is based on monoculture rice cultivation, and there are hardly any industries that can absorb additional manpower. In this situation, the sericulture industry, which includes tasar sericulture, has great importance. The production of raw silk from tasar silkworms was 43 tons in FY1994, the second largest in India[8].

1.2 Project Outline

In the seven districts of Bilaspur, Janjgir, Korba, Raigarh, Jashpur, Surguja and Korea of the State of Chhattisgarh[9], this project aims to expand the production of tasar silk through the development of the sericulture infrastructure and the provision of technical guidance to sericulture farmers[10], thereby contributing to employment creation and improvement in the standard of living of the poor.

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[4] Source: JICA materials for appraisal.
[5] "Bivoltine sericulture" means sericulture of a silkworm that has two broods per year.
[6] In FY1993, the poverty line was an income of 2,747 rupees per person.
[7] Source: JICA materials for appraisal.
[8] Source: JICA materials for appraisal.
[9] When administrative districts were revised in 1998, Bilaspur, Raigarh, and Surguja, the target three districts of this project at the time of the appraisal, were divided into seven districts of Bilaspur, Janjgir, Korba, Raigarh, Jashpur, Surguja, and Korea. There was no change in the project site.
[10] This project initially included "consideration of the feasibility of mulberry sericulture" (for details, see the section on "Efficiency").

Loan Approved Amount/ Disbursed Amount	2,212 million yen / 1,205 million yen
Exchange of Notes Date/ Loan Agreement Signing Date	October 1997 / December 1997
Terms and Conditions	Interest Rate 2.3% Repayment Period: 30 years (Grace Period:) (10 years) Conditions for Procurement General untied
Borrower/ Executing Agency (ies)	President of India/ Chhattisgarh Sericulture Department
Final Disbursement Date	February 2007
Main Consultant (Over 100 million yen)	Nippon Koei (Japan)
Feasibility Studies, etc.	Agriculture Finance Corporation Ltd., Bombay: F/S , 1993 JICA: Special Assistance for Project Formation (SAPROF) for the Madhya Pradesh and Manipur Sericulture Projects, 1996
Related Projects	(Japanese ODA loan) "Manipur Sericulture Project" (1997) (Technical cooperation) "Project for Promotion of the Popularization of Practical Bivoltine Sericulture Technology in India" (1997 - 2002) "Strengthening the Extension System for Bivoltine Sericulture in India" (2002 - 2007) (Other organizations' projects) World Bank: Kartanaka Sericulture Project World Bank and Swiss Agency for Development and Cooperation: National Sericulture Project Swiss Agency for Development and Cooperation: Interstate Tasar Project * All these projects were carried out in other states.

2. Outline of the Evaluation Study

2.1 External Evaluator

Ryujiro Sasao (IC Net Limited)

2.2 Duration of Evaluation Study

Duration of the Study: August 2013 – December 2014

Duration of the Field Study: January 26 – February 1, 2014; May 5 – May 18, 2014

2.3 Constraints during the Evaluation Study

In the State of Chhattisgarh, the External Evaluator could not basically enter the project site for security reasons. As a result, the local consultant familiar with the situation in the state and sericulture carried out a survey on the beneficiaries and inspection of the facilities under the supervision of the External Evaluator, who then carried out an evaluation based on the information.

3. Results of the Evaluation (Overall Rating: C[11])

3.1 Relevance (Rating: ③[12])

3.1.1 Relevance to the Development Plan of India

At the time of the appraisal (in 1994), India was the second highest producing country after China for the production of raw silk with a share of 13% of the world total production[13]. With rapid economic growth, however, the demand for silk sharply increased and domestic production could not keep up with the increase in demand, so that India imported about 4,000 tons of raw silk every year as the warp for weaving. Against this background, India placed importance on the development of sericulture mainly to meet domestic demand.

In the Eighth Five-Year Plan (1992–1996), besides the food crop production, the Indian Government mentioned sericulture as an agricultural industry that can increase incomes and employment in areas with rainfed agriculture and poor areas, in particular, those for the small-scale farmers.

At the time of the ex-post evaluation, the Twelfth Five-Year Plan (2012–2017) states that the annual production of silk should increase to 32,000 tons by 2017, assuming that it would increase by 7.14% every year[14]. To achieve this target, it is necessary to organize farmers' associations to create a multiplier effect between Research and Development/technical transfer and the promotion/production processes of the companies. In addition, in the 2014 annual plan,

[11] A: Highly satisfactory; B: Satisfactory; C: Partially satisfactory; D: Unsatisfactory.
[12] ③: High; ② Fair; ① Low.
[13] India produced 14,579 tons of raw silk in 1994.
[14] According to the Central Silk Board's 2013 material entitled "The Sericulture Industry in India," the provisional production of raw silk in 2011 was 23,060 tons.

the Chhattisgarh Department of Sericulture specified three objectives: employment creation through cocoon production and reeling/spinning; the supply of silk to local silk textile manufacturers; and meeting the demand for silk in India and abroad.

As described above, the Indian Government has continued to place importance on the promotion of sericulture in its development plans since the ex-ante evaluation. Therefore, this project is highly relevant to the development plan.

3.1.2 Relevance to the Development Needs of India

At the time of the appraisal, in the target seven districts in the State of Chhattisgarh, there were few industries other than those based on a single crop of rice, and the average poverty rate[15] was 75%. In addition, Schedule Caste and Schedule Tribes[16] accounted for about a half of the total population. Most of the households below the poverty line belonged to the Schedule Caste and Schedule Tribes. Therefore, it was highly necessary to provide the jobs for the poor people in the districts which enable them to be independent in a sustainable manner. Sericulture is particularly suitable as a means to achieve poverty reduction, because it enables the farmers to gain higher incomes with small investment, compared to other agricultural activities. In addition, it is regarded to be suitable for women because it mainly require delicate and detailed operations. At the time of the ex-post evaluation, the State of Chhattisgarh is one of the poorest states in India. Therefore, there is a great need for economic development on behalf of the poor[17].

It was confirmed beforehand that, in addition to such clear development needs, there is demand for silk yarn, a precondition for the feasibility of this project. Moreover, it has been confirmed since then that this demand has continued to remain high. According to the Indian Government's statistical information, the production of raw silk from tasar silkworms in the State of Chhattisgarh increased 2.1 times between 2004 and 2012[18]. In India as a whole, it increased 5.4 times and imports of raw silk account for about a half of the domestic production of all types of raw silk[19]. Because trends in production and imports correspond to the demand, it can be inferred that the demand for tasar silk, a precondition for this project, was certain to exist.

Therefore, at the time of both the ex-ante evaluation and the ex-post evaluation, the development need for sericulture was high.

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[15] The ratio of population that belongs to families with annual income less than 11,000 rupee (FY 1994).

[16] The Scheduled Castes are the castes authorized to be protected under the Constitution of India. The Scheduled Tribes are the indigenous people recognized under the Constitution of India. Reservation systems for the seats in the national and state assemblies, education, etc., exist on behalf of both the Scheduled Castes and Scheduled Tribes.

[17] According to statistics in FY2011–2012, the ratio of poor people to the population of the State of Chhattisgarh is 39.93%, which is higher than any other state in India (Source: "Press Note on Poverty Estimates, 2011–12," July 2013, Planning Commission).

[18] It increased from 145.2 tons in 2004 to 298.6 tons in 2012 (Source: Chhattisgarh Department of Sericulture).

[19] It increased from 322 tons in 2004 to 1,729 tons in 2012 (Source: Central Silk Board).

3.1.3 Relevance to Japan's ODA Policy

According to Japan's policy for ODA to India established in 1995, "poverty reduction" is one of the priority fields together with "economic infrastructure development" and "environment conservation." One of the priority subfields of "poverty reduction" is agricultural and rural development, including agricultural infrastructure development. Since this project, which contributes to poverty reduction through agricultural development, is consistent with the important issues specified in Japan's policy for ODA to India, it is highly relevant to Japan's ODA policy.

This project has been highly relevant to the country's development plan, the target area's development needs, as well as Japan's ODA policy. Therefore its relevance is high.

3.2 Effectiveness[20] (Rating: ②)

3.2.1 Quantitative Effects (Operation and Effect Indicators)

Although, at the time of the appraisal, clear operation and effect indicators had not been set for this project, the outcome expected under this project is "expansion of the production of tasar silk." With regard to this outcome, it was judged that it is appropriate to evaluate it using the indicators related to the production of tasar silk that have been specified in the revised Detailed Project Report (hereinafter referred to as "DPR")[21]. Table 1 shows the targets and results of the indicators. The following are the achievement rates of the initial target values of the main outcome indicators:

- Production of tasar silkworm seeds: 38%
- Production of cocoons: 17%
- Production of silk yarn and spun yarn: 49%

[20] Sub-rating for Effectiveness is to be put with the consideration of the Impact.
[21] After the beginning of this project, project management consultant engaged in the project prepared a DPR in May 1999. The DPR was revised in November 2000.

Table 1: Targets and Results of Indicators Related to Production of Tasar Silk

Item	Target[*1] (2006: scheduled year of project completion)	Results						Performance[*3]
		2003	2009[*3] (2 years after project completion)	2010 (3 years after project completion)	2011 (4 years after project completion)	2012 (5 years after project completion)	2013 (6 years after project completion)	
1. Sericulture								
(1) Production of cocoons (000) [*2]	94,463	1,862	15,628	14,166	15,412	13,366	13,427	17%
2. Total production of seeds (00,000)	27.33	0	10.32	12.82	11.75	13.59	12.06	38%
3. Process after cocoon production (tons)								
(1) Silk yarn	87.04	19.23	55.84	73.23	66.71	67.51	52.47	
(2) Spun yarn	54.96	4.62	13.40	17.58	16.00	16.20	34.98	
Total	142.00	23.85	69.24	90.81	82.71	83.71	87.45	49%[*4]

Note: *1. Source: revised DPR.

*2. The revised DPR calculated the production of cocoons, including the impact of this project on the existing plantations. However, because data on the existing plantations is difficult to collect and is not so influential, the figures are limited to new planting.

*3. According to the Economic Cash Flow specified in the revised DPR, it was assumed that the project effects would be fully developed two years after the completion of the facilities. Therefore, the performance was calculated by dividing the results of two years after the completion (2009) by the target.

*4. The target of 142 tons is a value for the entire project area. It means that consideration was given to not only the reelers/spinners who use the machines installed under this project, but also those for traditional reelers/spinners (not using the machines installed under this project). If the target is limited to the direct beneficiaries for the purpose of the calculation of performance, the target and the result (2009) are 45 tons and 35 tons, respectively. In this case, the performance is 78%. (The source for the target is the revised DPR, while the source for the result is the results of the interviews with the executing agency.)

The following are comparisons between the plan and the results according to the basic production processes of tasar sericulture (1. Planting of trees → 2. Production of seeds → 3. Production of cocoons → 4. Production of silk yarn and spun yarn):

1. Planting of trees: Trees have been planted on 4,000 hectares by 2003 as planned. However, of the 4,000 hectares of the planted area, only 2,600 hectares remained in 2013. The loss of 1,400 hectares was mainly due to the natural death of the feeding trees and airborne ash deposition[22]. It is inferred that 70–80% of the lost trees were due to natural death. The main reason for this is that the Department of Sericulture's

[22] According to an interview with the executing agency, the ash came from smoke emitted into the air from the chimneys of the neighboring steel plants or coal thermal power plants. Because they seem to fulfill the emissions standards in India, the executing agency has not made any special protest or proposal. As an alternative measure, the executing agency has planted trees in 1,529 hectares for tasar sericulture in areas where it is difficult for the ash to impact on these plants.

payment of maintenance expenses ended four years after the planting[23], however, the sericulture farmers could not fully pay the maintenance expenses afterwards. As a result, there was a shortage of money for fertilizers, and the necessary nourishment was not given to the feeding trees. With regard to the remaining 2,600 hectares, the quality and quantity of the feeding trees was also inadequate due to the lack of nourishment.

2. Production of seeds: The planned amount of 2.73 million seeds consisted of 1.8 million seeds for this project and 930,000 seeds for other purposes. In reality (in 2009), the production of seeds was only 1.03 million, which consisted of 570,000 for this project and 460,000 for other purposes. Only 57,000 seeds were supplied for this project because the number of seeds actually necessary for this project was far lower than planned. The reason why the number of supplied seeds was lower than planned was not because the seed station's production and supply capabilities were insufficient.

3. Production of cocoons: In 2009, the production of cocoons was 15.63 million, only 17% of the planned amount of 94.46 million. The main reasons are as follows: 1) the above-described decrease in the planting area of feeding trees for tasar silkworms; 2) a decrease in the number of seeds as input; and 3) the underdevelopment of the silkworms.
   With regard to 2), although it was assumed that 450 seeds would be distributed per hectare, the actual number of distributed seeds was about 200. With regard to 3), although it was initially assumed that the production of cocoons would be "50 cocoons per silkworm seed," the actual number was only 25, a half of the assumed number. Moreover, 2) was caused by a decrease in demand for seeds because of a decrease in the amount of feeding tree leaves and the immature sericulture skills of the farmers; 3) was caused by not only the immature sericulture skills of the farmers, but also the problematic quality of the feeding tree leaves. According to a sericulture expert, both 2) and 3) were caused by the poor maintenance of the planted trees and problematic sericulture skills.

4. Production of silk yarn and spun yarn: Although the initial target was 142 tons, the production of silk yarn and spun yarn in the seven project districts was actually 69 tons in 2009. In terms of raw materials, it was estimated that 18 tons were made from cocoons produced under this project, while 51 tons were made from cocoons produced in other areas.
   Given the number of reelers/spinners[24], their production level through the use of the machinery provided under this project was estimated to be about 35 tons. Therefore,

[23] Based on the preliminary analysis (which was carried out when the revised DPR was prepared), it was predicted that if the number of cocoons were produced as planned, the income from this would make it possible for sericulture farmers to pay maintenance expenses. According to the revised DPR, a micro-level simulation was carried out on how each farmer's income and expenditure levels would change if the Department of Sericulture paid maintenance expenses for several years just after the completion of planting until the production become stable. However, the incomes of the sericulture farmers do not seem to have increased as simulated, and confirmation as to whether the farmers had the intention to pay maintenance expenses seemed insufficient. Concretely, according to the simulation, the introduction of sericulture would increase each farmer's income by about 11,000 rupees, from which the additional cost of about 3,000 rupees for sericulture (mainly, expenses for fertilizers and pesticides) would be paid. However, because the increment was only about 8,000 rupees per farmer, the farmers hardly paid even the fertilizer expenses. According to an interview survey, one beneficiary farmer said that such a level of increment did not enable them to pay fertilizer expenses (which would require an increment of about 20,000 rupees).

[24] There are two types of spinning: reeling (weaving of yarn from normal cocoons) and spinning (weaving of yarn from broken cocoons). We mean either reeler or spinner by "reeler/spinner."

the production capacity of the machinery provided under this project[25] seems to have been sufficiently used.

In the production flow of sericulture, the causes for the differences between the initial plan and the results can be summarized as follows:

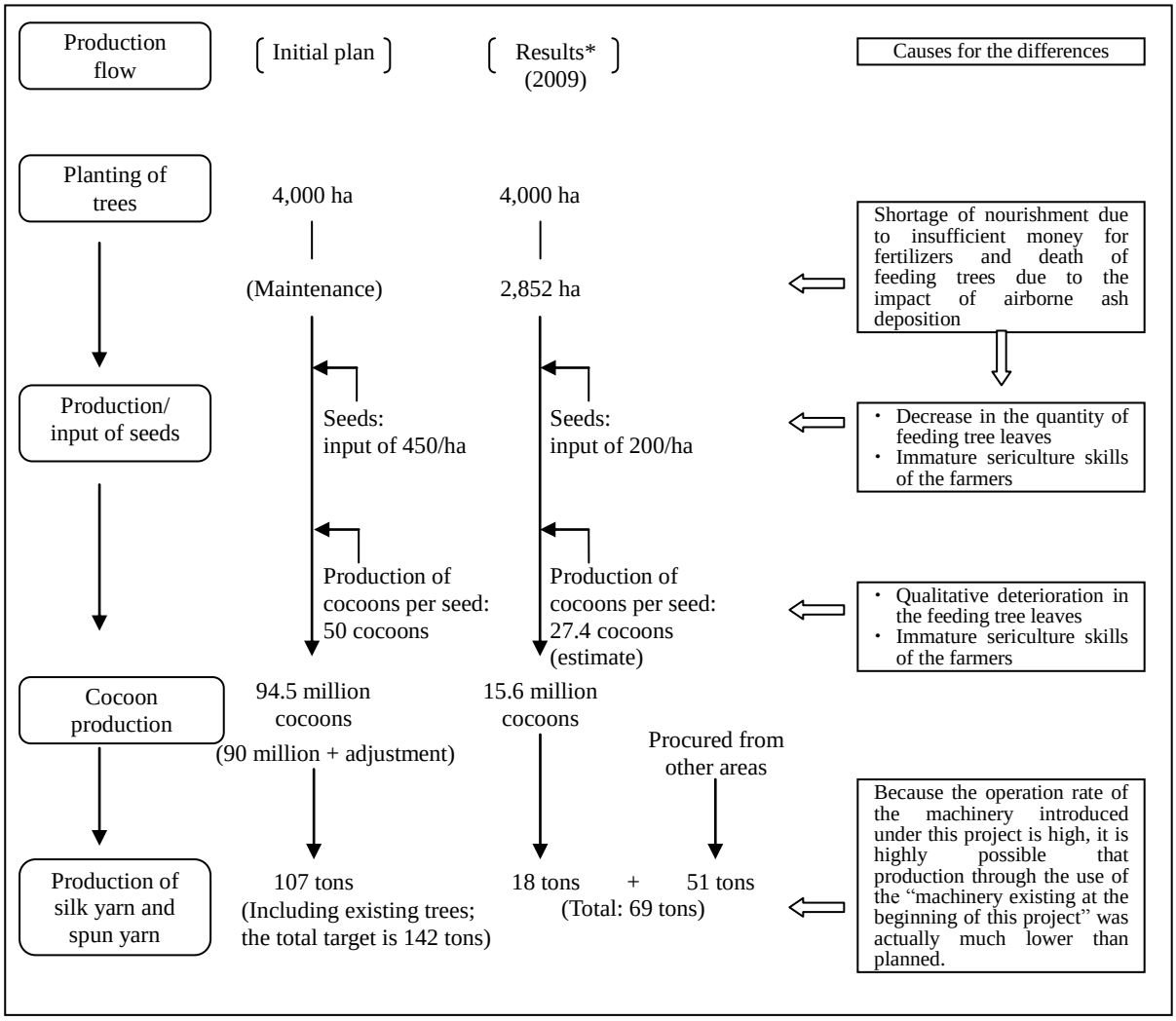

Figure 1: Explanatory Chart of the Differences between the Initial plan and Results in the Production Flow

Source: Prepared by the External Evaluator

Note: *The result in 2013 is the planting area of 2,628 (ha) × input of 200 seeds per unit hectare × 25.5 (number of produced cocoons per silkworm seed) = 13,427,000 (number of produced cocoons).

[25] When the revised DPR was prepared, a theoretical value was calculated at 45 tons on the assumption that all the beneficiaries (750 people) work for 300 days.

3.2.2 Qualitative Effects[26]

Although, according to the results of the questionnaire survey on the beneficiaries carried out during this ex-post evaluation[27], the farmers gave a relatively high evaluation on the condition of leaves of the feeding trees for the silkworms[28], the condition of the leaves is not good because of the lack of nourishment, and the number of silkworms per leaf area is low, according to an Indian expert on sericulture. However, the quality of the cocoons produced by the farmers is high, and the average selling price is almost the same as the standard price for the highest-quality cocoons in India[29]. Almost all the farmers answered that the selling price reflects the quality and is appropriate. Therefore, although there are problems in the quality of the feeding trees during the intermediate processes of the production flow, the quality of the cocoons is high as the final product.

The following summarizes an analysis of the emergence of outcomes according to cause-effect logic:

[26] Qualitative effects of this project other than statistical data were confirmed. Concretely, the quality of the products and the feeding trees for the silkworm was confirmed.

[27] During the nine days in late May 2014, five investigators, including a sericulture expert, carried out an interview survey on the beneficiary farmers in the seven target districts to investigate the effectiveness, impact, and sustainability of this project, applying random systematic sampling. The total number of samples was 211, consisting of 136 sericulture households and 75 reelers/spinners. With regard to the category of sericulture households, 32 beneficiaries (all of whom are women) are absent and male farmers responded to the questionnaire in place of the beneficiaries. The female respondents can be divided by age as follows: one woman in her 10s (1%); three women in their 20s (3%); 28 women in their 30s (27%); 43 women in their 40s (41%); 17 women in their 50s (16%); 12 women in their 60s and over (12%). Their average age is 44.9. Although all the reelers/spinners are also women, three respondents were men (surrogate respondents). The female respondents can be divided by age as follows: two women in their 10s (3%); 17 women in their 20s (24%); 31 women in their 30s (43%); 16 women in their 40s (22%); four women in their 50s (6%); two women in their 60s and over (3%). Their average age is 35.4.

[28] The number of respondents choosing "Highly satisfactory," "Satisfactory," "Improvement needed" and "Very problematic" were 43, 85, 8 and 0 respectively.

[29] Quality rank A (the other ranks are B, C, D and defective).

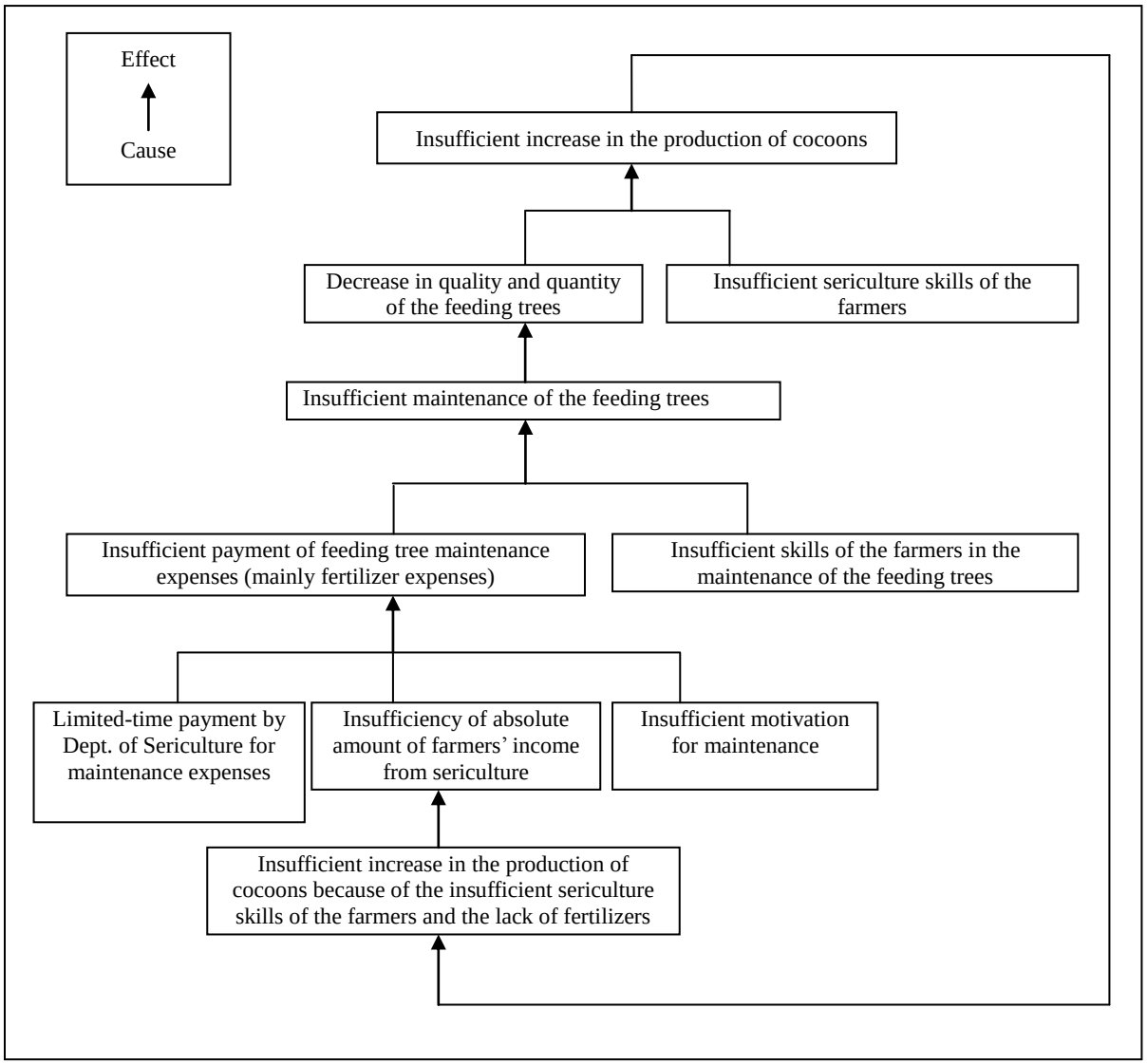

Figure 2: Analysis of the Emergence of Outcomes

3.3 Impact

3.3.1 Intended Impacts

The initially intended impact was the "creation of employment and improvement of the standard of living of the poor (especially, women)."

With regard to the "creation of employment," according to the executing agency, all the farmers and reelers/spinners participating in this project were newcomers. Therefore, employment was created for the number of beneficiaries involved (about 3,350)[30]. The qualifications for farmers covered by this project include the following: an income less than the poverty line; no ownership of land; and that they are female. These farmers were selected as

[30] Total of 2,600 new sericulture farmers and 750 new reelers/spinners.

planned initially and the sites for planting trees for tasar sericulture were selected under certain criteria[31].

Although the target number of tasar sericulture farmers in the project districts (all of them were women) was 4,000, the actual number was 0 in 2000, 3,718 in 2001 and 4,984 in 2002 (peak year). Subsequently, the number gradually declined and was 2,604 in 2013 (see Appendix 1). Because the number of sericulture farmers should be basically one per hectare, the decrease in the number of sericulture farmers reflects the above-mentioned decrease in the area of planting trees. Although the area of planting decreased partially because the feeding trees died due to ash deposition from neighboring steel plants and power plants, the death of the feeding trees is mainly caused by the failure of the sericulture farmers to provide fertilizers or take the necessary care of them. According to an interview with a sericulture expert who interviewed the sericulture farmers and the executing agency, it can be inferred that the farmers who continued to conduct sericulture can maintain the feeding trees because they have used pesticides, paid some fertilizer expenses by managing to raise funds and take care of the feeding trees somewhat carefully under the guidance of the Department of Sericulture.

Besides environmental factors, the reasons for the decline in the number of sericulture farmers include the "failure to give fertilizers or take necessary care of them" as described above. This seems to be because of the following: (1) the motivation for maintenance among the farmers is weak because they do not own the land on which the feeding trees are grown; and (2) the farmers' awareness of the problems and basic skills required for sericulture could not be developed fully because training for them at the first stage of this project was insufficient.

Therefore, the continuation of sericulture by the farmers requires the establishment of a system for providing a certain amount of pesticides and fertilizer, promotion of understanding by the farmers of the importance of the provision of pesticides and fertilizers, and the provision of the basic technical guidance necessary for sericulture.

Although the current number of beneficiary sericulture farmers is about 60% of the initial target, the number of sericulture farmers covered by this project has almost ceased to decline since 2009. The number of sericulture farmers does not include the number of reelers/spinners. The number of beneficiary reelers/spinners covered by this project is 750 (all of them are women), which is in accordance with the plan specified in the revised DPR (achievement rate: 100%).

[31] The criteria include accessibility from the house of the beneficiary farmers, flat plantation land, and a sufficient amount of soil.

In regard to "improvement of the standard of living of the poor," according to the results of the questionnaire survey on the beneficiaries, the farmers covered by this project receive benefits from this project, such as an increase in income[32] and an improvement in their standard of living, as shown in the following tables:

Table 2: Sericulture Farmers – Change in the Standard of Living after Participation in This Project

Item	Highly improved	Fairly improved	No change	Worsened	Total
No. of people	61	74	1	0	136
Ratio (%)	45	54	1	0	100

Table 3: Sericulture Farmers – Concrete Items indicating an Improvement in the Standard of Living [*1] (Top Five Items)

Item	No. of people	Ratio (%)
Purchase of more food	135	99
Receiving more medical services	129	95
Provision of better education to the children	89	65
Repair of the house	71	52
Savings	55	40

Note: **1. Multiple answers allowed.

As shown in the following tables, the results of the questionnaire survey on the beneficiaries also indicates that the beneficiary reelers/spinners of this project received benefits, such as an improvement in food consumption and the benefits of medical services:

Table 4: Reelers/Spinners – Change in the Standard of Living after Participation in This Project

Item	Highly improved	Fairly improved	No change	Worsened	No answer	Total
No. of people	49	22	3	0	1	75
Ratio (%)	65	29	4	0	1	100

[32] Information was collected through the questionnaire. Although the incomes of the farmers are generally on an upward trend, the External Evaluator refrained from calculating the average income because there are clearly abnormal values (including answer and interview mistakes) and because the units of the values are sometimes not uniform.

Table 5: Reelers/Spinners – Concrete Items indicating Improvement in the Standard of Living [*1] (Top Five Items)

Item	No. of people	Ratio (%)
Purchase of more food	70	93
Receiving more medical services	70	93
Provision of better education to the children	49	65
Increase in entertainment expenses	42	56
Increase in the purchase of daily necessities	38	51

Note: *1. Multiple answers allowed.

3.3.2 Other Impacts

1. Impacts on the natural environment

Because negative impacts on the environment were not assumed at the time of the appraisal, an environmental impact survey was not regarded as necessary. Moreover, it can be considered that this project restored forest resources through tree planting, thereby contributing to prevention of the degradation of forest vegetation and the discharge of sediment in the rainy season.

2. Land Acquisition and Resettlement

Because the sites where tasar sericulture was planned are owned by the Department of Forests, it was not necessary to acquire private land or resettle the residents.

3. Unintended Positive/Negative Impact

At the time of the appraisal, the participation of women (consideration of gender) was assumed as another impact of this project. The revised DPR's Section 6 "Institutional and Social Development Plan" has a heading entitled "Involvement of Women in the Project[33]." Under this heading, importance is placed on the role of self-help groups (hereinafter referred to as "SHG"). According to the executing agency, women's group activities had the following effects: "improvement in the sanitary condition of homes through the development of people's consciousness of public health"; "development of people's consciousness of nutrition"; "participation in health services provided by the government (such as vaccination)"; and "improvement of women's status in their home."

[33] This is virtually the same as the "Action Plan for the Consideration of Women," which was supposed to be prepared at the time of the appraisal.

According to the results of the questionnaire survey on the beneficiary sericulture farmers, almost all the respondents (135 of 136) answered that women's social standing improved. The following factors contributed to this improvement:[34]

Table 6: Factors Contributing to the Improvement of Women's Social Standing [*1]

Item	No. of people	Ratio (%)
Provision of a regular job and salary	132	97
Provision of work outside the home	101	74
Acquisition of self-confidence through sericulture	95	70
Various kinds of training	46	34

Note: *1. Multiple answers allowed.

Moreover, according to investigators of the questionnaire surveys on the beneficiaries, some women commented "Although before I did not have self-confidence and could not talk with strangers, lifting my face, now I can talk, lifting my face, because I'm earning a regular income from sericulture[35] and contributing to the family budget" and "I have become able to talk with my husband on an equal footing."

As described above, there are three types of indicators related to the production of tasar cocoons. With regard to the rating of the project in terms of effectiveness, performance is 38% for the production of seeds, 17% for the production of cocoons and 49% for the production of silk yarn and spun yarn. Because each of the indicators is important for "the production of tasar silk[36]," the average of the three indicators, which is 35%, is regarded as performance in terms of the quantitative effect (which falls under Rating ①[37]). On the other hand, from the viewpoint of employment creation and poverty reduction, both of which are the ultimate objective and main impacts of this project, the results of employment creation (the total number of new sericulture farmers and reelers/spinners to whom equipment was newly provided) reached 70% of the planned value[38]. With regard to poverty reduction, almost all the respondents to the questionnaire survey on the beneficiaries answered that their standard of living "Highly improved" or "Fairly improved." The ratio of those answering "Highly improved" is 45% for sericulture farmers and 65% for reelers/spinners. With regard to poor women, the target group of this project, almost all the respondents answered that women's social standing had improved.

[34] According to the results of the questionnaire survey on spinners, 72 of the 75 respondents also answered that women's social standing improved.
[35] According to the results of an interview with the executing agency, if a woman of an agriculture household is employed as a cleaner in a project district, she can earn about 42 rupees a day. On the other hand, if the income earned from sericulture under this project is converted into a daily wage, it becomes about 180 rupees.
[36] From the viewpoint of the actual inputs also, support is frequently given to activities related to the three indicators. Therefore, it cannot be said that one of them can represent the whole.
[37] This is evaluated as "unsatisfactory."
[38] The actual value (2,604 farmers + 750 spinners) ÷ planned value (4,000 farmers + 750 spinners) = 70.6%.

Taking into comprehensive consideration what has been described above, the effectiveness and the impact are fair.

3.4 Efficiency (Rating: ②)

3.4.1 Project Outputs

The plan and results of the project outputs are as follows:

The table below shows the results concerning the facilities. Although some of the result numbers are less than planned, they are not so different from the initially planned values. With regard to the consulting services, all the initially planned services were carried out, except for the detailed design for mulberry sericulture.

Table 7: Plan and Results of the Outputs

Item	Facility	Initial target (at the time of appraisal [*1])	Revised DPR [*2]	Revised target [*3]	Result [*4]	Reason for the change
1. **Tasar silkworm facilities**						
1) Tasar Plantation	Tasar feeding trees（ha）	4,000	4,000	4,000	4,000	None
2) Infrastructure for sericulture	Grainage (Mud House & Pairing Cage) (no.)	14	15	10	10	At the meeting in February 2002, ECC decided that the number of facilities should be reduced because the Dept. of Sericulture's existing facilities could be used.
	P2 Station (no.)	4	5	3	3	Same as above
	P3 Station (no.)	1		0	0	Because P3 station is maintained by the Central Silk Board and therefore the construction of stations was not essential for carrying out this project, it was excluded from the scope (although the initial plan aimed to establish the production flow of silkworms under this project, this change does not seem especially problematic).

	Cocoon godown for each District (no.)	3	3	3	3	Facilities were not newly established as initially planned; the Dept. of Sericulture's existing facilities were reconstructed.
	Village Cocoon Storage (no.)	30	30	10	10	Because the Dept. of Sericulture's existing facilities could be used, the number of facilities was reduced.
	Multiend Reeling Center (no.)	2 (40 machines)	500 machines	500 machines	500 machines	Although it was initially planned that 20 reeling machines would be installed at two places, the groups of reelers were unable to secure places where all the 20 machines could be installed. To improve the capacity to reel thread, 500 reeling machines were distributed to 48 women's groups in accordance with ECC's guidelines.
	Pedal Reeler (no.)	150	250	250	250	The number of machines was increased because demand for the production of silk yarn increased when the revised DPR was prepared and, as a result, it was necessary to improve the spinning capacity.
	Field Research and Training Center (no.)	1	1	1	1	None
	Project office	1	1	0	0	It was decided that the Dept. of Sericulture's existing facilities should be used.
3) Equipment	Vehicles for technology transfer (no.)	–	4	8	8	Although it was initially assumed that the project office would have one vehicle and each project district would have one vehicle, the number of vehicles was increased because the number of

						project districts increased from 3 to 7.
2. Consulting services						
2-1. Person-months	International consultants (person-months)	86	78	–	74	The total number of person-months decreased because some of the initially planned services were cancelled.
	Domestic consultants (person–months)	244	182	–	166	
	Technical support, clerical staff (person-months)	300	–	–	–	According to the executing agency, it was initially planned that staff members within the Dept. of Sericulture would be assigned to this category. Because there is no detailed record of the staff members' operations during the project period, the actual value cannot be calculated.

2-2. Operations	Plan	Result	Reason for the change
	1. Baseline survey and interviews with the people concerned	Carried out	None
	2. Review and preparation of the overall development plan and DPR for the planning of 4,000 ha of tasar and 3,000 ha of mulberry	Carried out	None
	3. Detailed design for the planting of 4,000 ha of tasar and 800 ha of mulberry	The detailed design for tasar was carried out, but that for mulberry was not carried out.	As described below in the text
	4. Assistance in bidding for the planting of 4,000 ha of tasar and 800 ha of mulberry	It was carried out for tasar, but was not carried out for mulberry.	As described below in the text
	5. Supervision of planting of 4,000 ha of tasar	Carried out	None
	6. Technical guidance and training	Carried out	None

Note: *1. December 1997.
*2. February 2007 (Because figures for the equipment (vehicles) were not written in the revised DPR, confirmation was made by an interview with the executing agency).
*3. February 2002 (set at the ECC meeting).
*4. February 2007 (source: project completion report).

In this way, the quantities decreased concerning many items. This is mainly because the Department of Sericulture's existing facilities were used. According to the executing agency,

neither the decrease in the number of seed stations nor the decrease in the number of rural silkworm warehouses had an adverse impact on this project. In contrast, to meet on-site demand, the number of spinning machines increased from the initial target set when the appraisal was carried out.

The plan (in accordance with the revised DPR) and results of the consulting service are as shown in the table above. Although most of the items were carried out according to plan, neither the detailed design for mulberry nor the supervision of the planting of the mulberry was carried out. With regard to mulberry silkworms, E/S (engineering service) was planned to be carried out. Although activities for the "formation of central seedbeds, the experimental planting of 60 ha of mulberry, and experimental breeding of mulberry silkworms" were carried out to examine the feasibility of mulberry sericulture, it was finally decided in September 2001 that the detailed design for mulberry sericulture would not be carried out, under the agreement with JICA, because it was agreed that "mulberry sericulture is not suitable for the project districts" considering the discussions at the Empowered Committee of Chhattisgarh (hereinafter referred to as "ECC")[39], the agency for supervising this project[40]. The executing agency's judgment that the detailed design for mulberry silkworms should be discontinued seems reasonable also in light of the weak financial condition of the farmers covered by the project.

Although the description above mainly concerns physical outputs, excluding the consulting services described last, this project also places importance on the strengthening of the capabilities and organization of people engaged in sericulture. Such non-physical outputs will be summarized below.

During this project, training was planned and provided to the personnel of the Department of Sericulture, NGOs and sericulture farmers. The trainings conducted for each type of participant are as follows:

[39] In this project, the relevant agencies were coordinated by ECC, which consists of principal secretaries of the Department of Sericulture, the Department of Finance, the Department of Co-operatives, and the Department of Forests.

[40] The reasons are as follows:

- A larger amount of investment in infrastructure is necessary for introducing mulberry sericulture than for introducing tasar sericulture. This is not realistic for poor farmers.
- The nature of the soil in the State of Chhattisgarh is not suitable for feeding trees for mulberry silkworms.
- Although irrigation facilities are necessary for mulberry sericulture, they have not been established in the State of Chhattisgarh.

1. Training for the Personnel of the Department of Sericulture

Table 8: Outline of the Training for Personnel of the Department of Sericulture

Training subjects/lecturers	Detail	Plan		Results	
		No. of participants	Period	No. of participants	Period
(Subjects) ・Tasar sericulture technology ・Mulberry sericulture technology ・Organization of farmers ・Lecturers' training (Lecturers) ・Staff members of public research institutes ・Consultants[41]	1. Overseas training	8	2 weeks	Cancelled during the process of the State of Chhattisgarh's separation and independence	
	2. Domestic training by relevant institutes in India	60	1 month	60	Unknown
	3. On-site training	80	1 week	None (Judged unnecessary)	

Training for the personnel of the Department of Sericulture was held from 1999 to 2000. Table 8 shows the subjects and lecturers. The table also shows the number of participants. The participants were field officers who supervise the field staff members directly engaged in the provision of guidance to sericulture farmers. According to an executive of the executing agency, they were highly satisfied with the training. As a result, the participants were able to use what they learned to carry out on-site activities[42]. Therefore, the training seems to have indirectly contributed to the realization of the project effects through the provision of guidance to the farmers (OJT) by the field staff members.

[41] Lectures by consultants were conducted as a part of the consulting services (corresponding to Table 7, "2. Consulting Services," "2-2. Operations," "6. Technical guidance and training").

[42] There are no detailed records on the degree of satisfaction as in the case of a questionnaire survey of the participants.

2. Training for NGOs

Table 9: Outline of the Training for NGOs

Outline of the training	Details	Plan		Results	
		No. of participants	Period	No. of participants	Period
(Subjects) ・Sericulture technology ・Organization of farmers ・Marketing ・Accounting ・Management of co-operatives (Lecturers) ・Consultant[43] ・Personnel of the Sericulture Dept. ・External resource person	1. Domestic training by relevant institutes in India	21	1 month	21*1	Unknown
	2. On–site training	60	2 weeks	60*2	Unknown

Note: *1. NGO staff.
*2. NGOs' local coordinators.

Training for NGOs was also held from 1999 to 2000. Table 9 shows the subjects, the lecturers and the participants. According to an interview with an executive of the executing agency, the participants were highly satisfied with the training. A concrete effect of the training is the participants' use of what they learned in the workshops to provide guidance for the farmers, which contributed to the achievement of the project purpose to some extent at the early stage of the project.

3. Training for sericulture farmers

Training was planned to be given to 4,175 silkworm farmers, 250 silkworm seed farmers and 540 reelers/spinners for 45 days, 15 days and 60 days respectively. However, because construction of the technical training center at which the training was to be given was completed in September 2006, the final stage of the project period, full-scale training was hardly given to the beneficiary farmers during the period. Basically, only a two-day workshop was held at the early stage. The contents of the workshop included a summary explanation of tasar sericulture (A two-page pamphlet full of illustrations was used, because the beneficiary farmers cannot read or write much.) and encouragement of the farmers to organize themselves. In addition to the workshop, on-the-job instructions about actual sericulture activities were given by staff members of the Department of Sericulture. They have been monitoring the

[43] Lectures by consultants were conducted as a part of the consulting services (corresponding to Table 7, "2. Consulting Services," "2-2. Operations," "6. Technical guidance and training").

farmers' work, visiting their workplaces almost every day during the sericulture period. At the time of the ex-post evaluation, however, the technical level of the beneficiary farmers is still primitive. Therefore, it cannot be said that there was sufficient guidance given to the beneficiary farmers[44].

In summary, although training was given to the personnel of the Department of Sericulture and NGOs and has had some effects, full–scale training was not given to sericulture farmers, resulting in a lack of appropriate sericulture skills.

3.4.2 Project Inputs

3.4.2.1 Project Cost

The planned and actual project costs are as follows:

Table 10: Project Cost

(Currency unit: million)

Item	Planned cost (at the time of appraisal) *1		Actual cost*2	
	Rupee	Yen	Rupee	Yen
1-1.Tasar Plantation*3	207	705	181	485
1-2. Supporting Facilities	179	609	61	164
2.Procurement of Equipment	34	117	21	56
3.Land Acquisition	295	1,006	215	576
4.Department of Sericulture: Recurrent Cost for Project	119	406	326	874
5.Contingency	83	284	29	78
6.Price Escalation	–	–	30	80
7.Consultancy services	182	622	121	324
8.Interest during construction	72	245	30	80
Total	1,171	3,995*4	1,014	2,718*4

Note: *1. Conditions for the calculation are as follows (JICA materials for appraisal):
- Date of the calculation: April 1997
- Exchange rate: 1 rupee = 3.41 yen
- Contingency: 10.0%
- Price escalation: foreign currency, 2% per year: domestic currency, 8.6% per year

*2. Sources: the actual costs in rupees were provided by the executing agency; those in yen were calculated by the use of the average rate during the loan period (1 rupee = 2.68 yen).
*3. Concretely, labour cost (which accounts for about 50%), fertilizers, pesticides, etc.
*4. Figures may not match the total due to rounding off.

[44] Although JICA carried out two technical cooperation projects, "The Project for Promotion of the Popularization of Practical Bivoltine Sericulture Technology in India" and "Strengthening the Extension System for Bivoltine Sericulture in India," JICA could not use them for supporting the capability improvement of the staff of the Department of Sericulture and the beneficiary farmers in this project. Although bivoltine sericulture technology was applied for tasar in the project, the bivoltine sericulture technology in two technical cooperation projects on the above is for mulberry, therefore it cannot be applied for tasar.

Comparing the planned cost at the time of the appraisal and the actual cost in terms of yen, the actual cost (2,718 million yen) is lower than planned and only 68% of the planned cost (3,995 million yen)[45]. The reasons are as follows.

In terms of rupees, although there was an increase in the actual cost for "the Department of Sericulture's administrative costs[46]," the total actual cost (1,014 million rupees) was lower than the initially planned total cost (1,171 million rupees) by 13% due to the following factors:

- Decrease in the cost of establishing the infrastructure for tasar sericulture[47]
- Decrease in the cost of consulting services[48]

Moreover, because the yen appreciated by about 21% from the time of the appraisal during the implementation of the project, the ratio of the actual cost to the planned cost further decreased in terms of yen.

3.4.2.2 Project Period

This project was scheduled for 88 months from December 1997, when the L/A (loan agreement) was expected to be signed, to March 2005, which was the scheduled date of completion[49]. In reality, it took 111 months from December 1997 to February 2007. Thus the actual period was longer than planned and 126% of the planned one.

The main reasons for the prolonged period are as follows:

In November 2000, the State of Chhattisgarh, in which the project site is located, was separated and became independent from the State of Madhya Pradesh. After this, ECC was established to supervise this project, and DPR, the detailed plan for this project, was approved in February 2002. Because of this, various construction works, which was initially scheduled to start in 2000 and 2001, actually started in 2002 and 2003. Because of a delay in the approval of the detailed plan as a result of the separation and independence of the State of Chhattisgarh, there was a delay in the construction work and training activities could not be carried out in earnest, although there was no serious impact on planting activities in particular.

The construction work was delayed for six to eight months because of the above reason and also of the following reasons. Because a hike in the prices for materials caused some successful bidders to withdraw, it was necessary to hold bidding for some work again. The hiking of prices also caused a delay in some constructors' start of the construction. There was also a delay in the supply of materials for roofs.

[45] There was a minute increase or decrease in the infrastructure costs, which accounted for only a slight portion of the project costs. In addition, some portions of the consulting services were excluded. However, neither seems to have reached a level that required adjustment, especially in the calculation of the ratios.
[46] The cost increased because it might have been underestimated and because commodity prices rose.
[47] The cost was saved because existing facilities were more actively used than initially planned.
[48] The cost decreased because consulting services (detailed design) related to mulberry sericulture was excluded.
[49] The scheduled date of completion is defined as the date when all the project facilities are completed.

In this way, the project period was prolonged mainly because of external factors, such as stagnant project activities during the process of the state's independence and the hiking of prices for materials.

3.4.3 Results of Calculations of Internal Rate of Return (Reference only)

Because the detailed process of the calculation of the economic internal rate of return (EIRR) at the time of appraisal was unknown, the EIRR was recalculated for this ex-post evaluation using the calculation method specified in the revised DPR[50].

Table 11: Results of the Calculation of the EIRR

The time of calculation	At the time of the appraisal (1997)	Recalculation at the time of the ex-post evaluation
1. Calculation method (in local currency)	Costs: construction costs, material and equipment procurement costs, consulting costs, administrative costs, contingency, maintenance costs, replanting/material and equipment renewal costs Benefits: Additional benefits from an increase in cocoon production, additional benefits from the processing of cocoons into raw silk and silk products Project life: 30 years	
2. EIRR	15.9%	Negative

The recalculated EIRR is negative and is far lower than the EIRR at the time of the appraisal or the EIRR specified in the revised DPR. This is because, although the project cost was a little lower than planned, the production of cocoons was only 17% of the target, and the benefits greatly decreased.

Although the project cost was within the plan, the project period exceeded the plan. Therefore, the efficiency of this project is fair.

3.5 Sustainability (Rating: ②)

3.5.1 Institutional Aspects of Operation and Maintenance

This project was carried out by the Chhattisgarh Department of Sericulture.

The project period can be divided into the start-up period and the production period. As planned initially, the Department of Sericulture and the consultant played central roles in the first half of the start-up period, while the Department of Sericulture, the sericulture

[50] According to the revised DPR, the EIRR is calculated at 17.4%. Because no data on the benefits related to the portion of existing trees were provided from the executing agency, the data at the time of the planning were used as they were.

co-operatives, the federation of co-operatives and NGOs supported the planting of the feeding trees and the production of cocoons and silk yarn in the second half of the start-up period and the production period[51]. Sericulture farmers formed the Sericulture Farmers Group (SFG) and the Self-Help Group (SHG), both of which are carrying out activities. Under this project, relevant agencies were coordinated by ECC, which consists of principal secretaries of the Department of Sericulture, the Department of Finance, the Department of Co-operatives and the Department of Forests.

Since the completion of this project, sericulture has been carried out as follows:

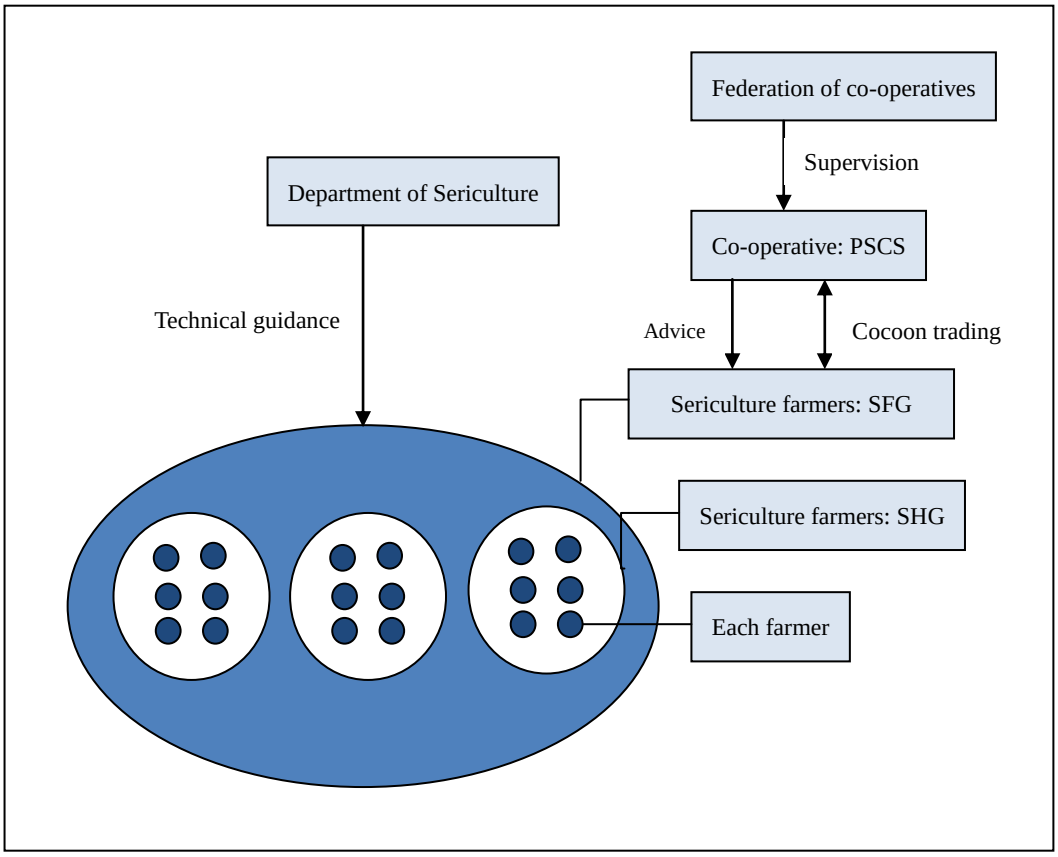

Figure 3: Relationships among Sericulture-related Organizations

The role of each agency can be described in detail as follows:

1) Department of Sericulture

The total number of personnel of the Department of Sericulture is about 1,000[52]. Under the supervision of the Joint Director of the Headquarters, the Deputy Director or the Assistant Director is in charge of the 16 districts in the state, and guidance is given to sericulture farmers

[51] NGOs mainly gave guidance to the beneficiary farmers during the start-up period of this project, but were not carrying out activities at the time of the ex-post evaluation.
[52] As of May 2014.

in each of the districts. Guidance is directly given to the farmers by field staff members of the Department of Sericulture[53]. They monitor the farmers' work during the sericulture season, visiting fields almost every day. Because the number of field staff members is about 90 per district, each field officer is in charge of six farmers. Therefore, the number of them is sufficient. The Department of Sericulture also supports farmers in repairing spinning machines. In addition, the technical training center under the Department provides training and workshops for the personnel of the Department of Sericulture and sericulture farmers. The number of participants in training and workshops has been increasing year by year and was 1,278 in FY2012–13.

2) SFG

This is a group for the rearing of silkworms and the production of cocoons. One group is established in one site (the total number of sites is 155). The number of members of each SFG is about 17 on average.

3) SHG

This is a group for savings and other economic activities (for pooling a fixed amount of money and mutually lending money when needed). Because, in light of its economic activities, it is desirable to minimize the size of the organization, an SFG has been divided into two or three SHGs. Both the SFGs and SHGs have remained active even after the end of this project.

4) Co-operative

Aggregates of a number of SFGs form Primary Sericulture Co-operative Societies (hereinafter referred to as "PSCS"). PSCS are not organizations newly established under this project, but existing organizations in which each SFG has participated in each district. Each farmer sells cocoons to a PSCS, which then sells them to reelers/spinners in the district. The PSCS also give advice to farmers about methods of producing high-grade cocoons and provide small loans to farmers for the purchase of pesticides.

5) Federation of co-operatives

The federation of co-operatives is officially called the "Chhattisgarh Khadi and Village Industries Board." This organization's activities are limited to the supervision of the co-operatives under its control.

The following is a comparison between the sericulture system under this project and those in other regions of India:

[53] They are called "field men" or "operatives."

Table 12: Sericulture Systems in India

Region	Characteristics		
	Ownership of plantations	Responsibility for maintenance of the planted trees	Technical guidance to farmers
1. This project	Sericulture farmers have only the right to use the land.	Responsibility belongs to the farmers (the Department of Sericulture gives financial support only for the initial four years).	Provided by the Department of Sericulture.
2. Other sericulture in Chhattisgarh	Sericulture farmers do not have any official right to use the land, but are allowed to rear silkworms.	Responsibility belongs to the Department of Sericulture.	Somewhat compulsory guidance is provided by the Department of Sericulture.
3. Other main tasar sericulture states			
1) Madhya Pradesh	Same as 2 above		
2) Bihar, Jharkhand	Plantations: belongs to the farmers.	Responsibility for maintenance of the planted trees: belongs to the farmers.	Provided by the Department of Sericulture with the participation of local NGOs.

As shown in the table above, usually sericulture farmers who own plantations are responsible for maintaining them. If sericulture farmers do not own the plantations, the Department of Sericulture maintains them. This project is exceptional because farmers do not have ownership of plantations, but are responsible for their maintenance. According to interviews about examples in the main tasar sericulture states, the average income for sericulture farmers in the States of Bihar and Jharkhand is clearly higher than that in the project districts. The sericulture farmers in those states can use some of their income for purchasing fertilizers.

Next, with regard to the system for maintaining the sericulture facilities, a person in charge of maintenance has been appointed for each facility. The working directive/job chart has specified the missions and duties of the Department of Sericulture's officers in charge of maintenance (for details of the maintenance system, see Appendix 2). According to the executing agency, the number of people in charge of the maintenance of each facility has reached a level that is sufficient to carry out the necessary operations. In addition, according to the results of inspections by an Indian sericulture expert, there are a sufficient number of people in charge of maintenance. Although the Department of Sericulture rotates the officers in charge of maintenance every three to five years, the number of them is stable. With regard to the management of each facility, there are simple guidelines, and there is no problem in the procurement of spare parts.

With regard to the organizational aspects, as shown in Figure 3 and the description thereafter, the roles of the agencies related to sericulture farmers are clear and the necessary functions have been performed. However, this project's method whereby "farmers do not have the ownership of the plantations, but are responsible for the maintenance" seems to lack fairness somewhat and makes it difficult for the farmers to develop their motivation to maintain the planted trees.

3.5.2 Technical Aspects of Operation and Maintenance

According to the executing agency, training and OJT at the Central Silk Board and the Field Research and Training Center have made it possible to maintain the sericulture facilities using appropriate techniques. Inspections by sericulture expert in four districts have also confirmed that sericulture facilities have been maintained by appropriate techniques. There is no special problem in the actual management of the facilities. However, the skills of sericulture farmers are still primitive. For example, although it is usual that "at the initial stage of silkworm rearing, the trees should be covered by nets to prevent the larvae from being eaten by birds or from being washed off by the rainwater," only about 20% of the farmers seem to take such measures[54]. While co-operatives give advice about the quality of the cocoons, the federation of co-operatives does not give technical guidance.

Therefore, there are some technical issues to be improved and it is necessary to strengthen the guidance to sericulture farmers.

3.5.3 Financial Aspects of Operation and Maintenance

According to the executing agency, the budgets for the maintenance of the facilities are as follows[55]:

[54] This inference was made by the sericulture expert who inspected the districts, accompanying the beneficiary survey.

[55] Because the maintenance costs limited to the facilities established under the project were not calculated after the completion of this project, it was difficult to extract information on the cost of maintaining the project facilities. The maintenance costs for sericulture facilities for the whole state have been on an upward trend for the past three years.

Table 13: Budgets for the Maintenance of the Facilities

Facilities	Four-grade evaluation of budget sufficiency*	Measures in case of insufficient budget
Tasar Plantation	1	There is room for the use of government support measures.
Grainage (Mud House & Pairing Cage) (10)	3	Not applicable
P2 Station (3)	3	Not applicable
Cocoon godown for each District (3)	3	Not applicable
Village Cocoon Storage (10)	3	Not applicable
CSTRI Reeling machines (500)	3	Not applicable
Pedal Reeler (250)	3	Not applicable
Field Research and Training Center (1)	4	Not applicable

Note: * "4: Sufficient to maintain the facilities; 3: Minimum required level for maintenance; 2: Not very sufficient; 1: Not sufficient at all."

Although there is no special problem in the budgets for the maintenance of the facilities, the budget for maintaining the feeding trees for tasar silkworms is clearly insufficient. Therefore, it is necessary to secure the budget.

The financial condition of each organization is as follows:

1) Farmers

According to an interview with the executing agency, a typical beneficiary farmer earns an annual income of about 29,000 rupees. Of this amount, about 8,000 rupees are from sericulture (this can be said to be the net income increment produced by this project). All the income (29,000 rupees) is said to be used for consumption. As described above, farmers are responsible for the maintenance of trees planted for tasar sericulture. However, farmers cannot afford to maintain them. In reality, benefits are paid to farmers for four years during the planting period, and the farmers were required to save 25% of these benefits. The saved money becomes a fund for the maintenance of the plantations and the interest is used for maintenance. The amount of annual interest is about 700 rupees per hectare, which can be used only for purchasing pesticides. As farmers neither have enough money nor land ownership, they lack the motivation to maintain the plantations and have not purchased sufficient fertilizers to maintain them.

2) Co-operative (PSCS)

There is no problem in particular, but the co-operatives cannot financially afford to support maintaining the planted trees.

With regard to budgets for the maintenance of the feeding trees for tasar sericulture, availability of the government's support measures for two schemes to plant trees for sericulture was confirmed during the study for this ex-post evaluation. One of them is called MG NREGA (Mahatma Gandhi National Rural Employment Guarantee Act), utilizing which the government can give financial support for wages for the replanting of trees during the first three years. The other scheme is the Central Silk Board's CDP (Catalytic Development Program). This financial support program is applied not only to the replanting of trees, but also to the maintenance of existing trees. Although the executing agency of this project has already applied for MG NREGA and replanted trees on 1,359 hectares, it will be possible to apply for CDP to support the maintenance of trees planted under this project.

The entire financial condition can be summarized as follows: although the maintenance of sericulture facilities has no problem in particular, the financial conditions require remedies that enable sericulture farmers to appropriately maintain the plantations for tasar sericulture.

3.5.4 Current Status of Operation and Maintenance

A four-grade evaluation[56] of the operation of the facilities (eight types) was conducted by the executing agency. Because all are evaluated as 2nd or higher, there is no serious problem. In addition, appropriate maintenance of the sericulture facilities was confirmed through the above-described inspection of four districts by the sericulture expert. With regard to the feeding trees for tasar silkworms, more than six years have already passed after the completion of this project, and the area of feeding trees has ceased to reduce and is on a stable trend, but the quality of the feeding trees is still problematic due to the insufficient use of fertilizers.

Under such circumstances, with regard to the three preconditions for the maintenance, the organization and personnel of the sericulture facilities are stable. The number of sericulture farmers is also stable, although the number has not reached the peak level. With regard to techniques, the sericulture techniques of the farmers in particular have room for improvement. However, this problem is not so serious as to threaten the sustainability, because the production of cocoons has been generally stable for the six years since the completion of this project. With regard to the financial aspects, although the maintenance of the sericulture facilities has no problem in particular, the farmers' lack of funds for maintaining their plantations (especially funds for purchasing fertilizers) is problematic. However, in spite of the lack of funds for maintaining them, the sericulture business conditions for the farmers are not so unfavorable as to threaten sustainability in the near future[57].

[56] The four grades are "4: Highly satisfactory," "3: Satisfactory," "2: Not especially problematic" and "1: Problematic."

[57] According to the results of the questionnaire survey on the beneficiaries, 105 respondents (77%) answered that tasar sericulture will be "Sustainable" in the future, followed by 25 respondents answering "Don't know" (18%) and six respondents answering "Not sustainable" (4%).

Therefore, although the operation and maintenance of the facilities established under this project are stable in terms of the organizational and personnel aspects, they have minor problems with regard to the technical and financial aspects. In addition, although the facilities have been maintained appropriately and the area of feeding trees for tasar silkworms has ceased to decline and has been stable, the quality of the feeding trees is still problematic. The sustainability of the effects produced by this project is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

Because the implementation of this project is sufficiently consistent with the Indian Government's development plan, the target site's development needs and Japan's aid policy, its relevance is high. Silkworm feed trees were planted as planned initially. Regarding the initially estimated impacts, such as employment creation and an improvement in the standard of living of the poor, although each of the production of seeds, cocoons, silk yarn and spun yarn are lower than initially planned, many poor women are able to work in sericulture and their standard of living is improving. Therefore, it can be judged that the effectiveness and the impact are fair. The efficiency is also fair, because the project costs were within the plan, while the project period was longer than planned. Although the operation and maintenance of this project is stable in terms of organization and personnel, there are problems in the technical and financial aspects. Therefore, the sustainability of the effects produced by this project is fair.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

Figure 2 shows the causes for the insufficient emergence of outcomes under this project. Because the provision of financial support to the farmers for planting ended when the production of cocoons had still not reached a sufficient level, and because the weak motivation of the farmers to carry out maintenance due to their insufficient incomes and their lack of ownership of the planting sites, maintenance budgets became insufficient, resulting in a decrease in the quality and quantity of the feeding trees. The inadequate skills of the farmers due to a lack of training also resulted in sluggish growth in the production of cocoons. In states other than project ones, however, there are cases where sericulture farmers own the plantations, earning higher incomes and managing to purchase fertilizers. Moreover, according to the sericulture expert, an increase in the investment per hectare by only 2,000 rupees will have a considerable effect. Thus, the potential for the expansion of production seems great in the project site. It is therefore desirable to improve technical guidance to the farmers by introducing

government financial support for maintenance, such as CDP, standardizing the minimum necessary maintenance operations in the form of a checklist and thoroughly teaching how to use the checklist through training or on-the-job instruction.

4.2.2 Recommendations to JICA

JICA should encourage the Department of Sericulture to provide government support for the maintenance budget.

4.3 Lessons Learned

1) Necessity for the establishment of effective maintenance systems at a planning stage

The reasons for an insufficient maintenance budget for feeding trees in this project are "farmers' insufficient incomes owing to sluggish growth of cocoon production", "weak motivation of the farmers due to their lack of ownership of the planting sites," "inadequate skills of the farmers," as well as the Department of Sericulture gave financial support for the maintenance of feeding trees for only limited time.

Therefore, at the stage of preparing the detailed plan in the future projects in sericulture sector, it is necessary to consider how the parties concerned should share responsibilities over a certain period, taking into consideration the situation of plantation and land ownership, capability of cost shouldering, technical guidance and also cases in other states.

2) Necessity of training of new sericulture farmers

At the early stage of this project, the initially assumed full-scale training was not given to the farmers. Only two-day workshops and OJT after tree planting were conducted. Therefore, newcomer sericulture farmers only partially carried out the basic operations needed for sericulture. Because such insufficient technical guidance seems to have impeded the realization of the effects, it will be necessary to strengthen the training of farmers (especially at the early stage) when a similar project is carried out in the future.

Appendix 1

The following table shows the trends in the number of beneficiary sericulture farmers (tasar) and the number of sericulture farmers in the whole of the state (tasar):

Table: Trends in the Number of Tasar Sericulture Farmers

Year	Number of tasar sericulture farmers in the project site	Number of tasar sericulture farmers in the State of Chhattisgarh	Ratio of sericulture farmers in the project site to the state total
2000	0	4,965	0%
2001	3,718	6,811	55%
2002	4,984	8,430	59%
2003	1,582	7,832	20%
2004	3,047	9,098	33%
2005	2,735	9,124	30%
2006	3,320	9,709	34%
2007	3,503	11,604	30%
2008	3,103	8,057	39%
2009	2,754	7,434	37%
2010	2,567	6,881	37%
2011	2,278	8,179	28%
2012	2,606	8,729	30%
2013	2,604	n.a.	n.a.

Source: Chhattisgarh Department of Sericulture

According to the executing agency, the number of sericulture farmers changed frequently and has not become stable because of the following (the numbers of farmers in the table are not annual averages, but numbers counted at specific points in time):

- People left their homes to work in factories.
- Withdrawal from sericulture because of the weather. (If the monsoon season begins earlier or ends later than normal, the sericulture period may overlap with the cultivation season for other farm products and it is necessary to decide between the two.)
- Participation in rituals (to which farmers sometimes give priority over sericulture).

Appendix 2: Details of the Maintenance Systems

The following table shows each facility's person/department in charge of maintenance, use of a manual, and difficulties in the procurement of spare parts:

Table: Maintenance Systems for the Facilities

Facility	Person in charge of maintenance	Use of a manual	Procurement of spare parts
Tasar Plantation	Sericulture farmers (SHG)	Yes	N/A
Grainage (Mud House & Pairing Cage) (10)	Dept. of Sericulture's field officer/senior sericulture inspector	Yes *	No problem
P2 Station (3)	Dept. of Sericulture's field officer/senior sericulture inspector	Yes *	No problem
Cocoon godown for each District (3)	Dept. of Sericulture's District Sericulture Officer	Yes *	No problem
Village Cocoon Storage (10)	Dept. of Sericulture's District Sericulture Officer	Yes *	No problem
CSTRI Reeling machines (500)	Each group (reelers)	Yes *	No problem
Pedal Reeler (250)	Each reeler	Yes *	No problem
Field Research and Training Center (1)	Dept. of Sericulture's Joint Director	Yes *	No problem

Note: If * is attached, simple guidelines are used instead of a manual.

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Comparison of the Original and Actual Scope of the Project

Item	Plan [*1]		Actual
1. Project Outputs	Appraisal Record (Dec. 1997)	Revised DPR (Nov. 2000)	At the time of completion of this project
1) Tasar sericulture: Facilities and equipment			
Tasar plantation (ha)	4,000	4,000	As planned
Grainage (Mud House & Pairing Cage) (no.)	14	15	10
P2 Station (no.)	4	5	3
P3 Station (no.)	1	–	0
Cocoon godown for each District (no.)	3	3	As planned
Village Cocoon Storage (no.)	30	30	10
CSTRI Reeling machines (no.)	40	500	500
Pedal Reeler (no.)	150	250	250
Field Research and Training Center (no.)	1	1	As planned
Project office (no.)	1	1	0
Vehicles for technology transfer	–	4	8
2) Consulting services			
International consultant (M/M)	–	78	74
Domestic consultant (M/M)	–	182	166
2. Project Period	December 1997 - March 2005 (88 months)		December 1997 - February 2007 (111 months)
3.Project Cost Amount paid in Foreign currency Amount paid in Domestic currency Total Japanese ODA loan portion Exchange rate	867 million yen 3,128 million yen (Local currency) 917 million rupees 3,995 million yen 2,212 million yen 1 rupee = 3.41 yen (As of April 1997)		405 million yen 2,313 million yen (Local currency) 863 million rupees 2,718 million yen 1,205 million yen 1 rupee = 2.68 yen (Average between 1997 and 2007)

Note: *1. Because the plan for this project was frequently revised, this table shows two versions of the plan.

Democratic Socialist Republic of Sri Lanka

Ex-Post Evaluation of Japanese ODA Loan Project

"Sri Lanka Tsunami Affected Area Recovery and Takeoff Project"

External Evaluator: Yumiko Onishi, IC Net Limited

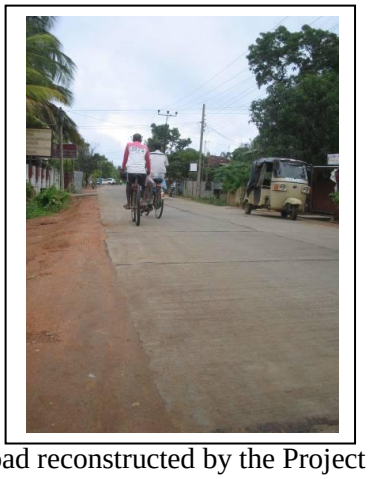
0. Summary

The objective of the Sri Lanka Tsunami Affected Area Recovery and Takeoff Project (hereinafter referred to as the "Project") is to secure essential utilities in the areas affected by the tsunami of December 2004 and to obtain investment for small business firms in the areas by supporting rehabilitation and reconstruction of small-scale infrastructures and providing financial assistance to small businesses including the fisheries and tourism sectors. The Project is consistent with the development plan and needs of Sri Lanka after the tsunami and is in line with the ODA policy of Japan. Small-scale infrastructures reconstructed by the Project are similar to or better than those before the tsunami while the lives of more than half the project beneficiaries have recovered to the same level as before the tsunami or have become better than the pre-tsunami level. Some benefits are seen such as some households that had no access to water supply and power before the tsunami gained access to them through the Project. In the Small Business Revival Program, while the non-performing loan ratios of the beneficiary firms are below the target, it is confirmed that the loans from the Project have helped rebuild the businesses. The effectiveness and impact of the Project are high because the Project has contributed to improving the livelihood of the tsunami-affected population and the economic recovery of the affected areas. The efficiency of the Project is fair because, although the project cost was as planned, there was a substantial delay in the implementation period of the Infrastructure Rehabilitation Program. In general, no major problems have been observed in the institutional and technical aspects of the operation and maintenance system. However, there are minor issues in the financial aspect. Therefore, the sustainability of the Project effect is fair.

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

1. Project Description

Project locations



Road reconstructed by the Project

1.1 Background

The earthquake and subsequent tsunami that occurred in Sumatra, Indonesia on December 26, 2004 brought damages to not only Indonesia and other Asian countries such as Sri Lanka, Thailand, Malaysia, the Maldives, and India, but also African countries like Kenya, Tanzania and Seychelles. In Sri Lanka, the tsunami caused extensive damages including the loss of the lives of more than 30,000 people.

Based on the request from the Government of Sri Lanka, three largest donors to the country, the Japan International Cooperation Agency (JICA), the World Bank, and the Asian Development Bank (ADB) conducted the Joint Needs Assessment (Phase I) from January 2005. The needs assessment survey confirmed that damage of approximately USD 1 billion occurred along the North, East and Southern coastal areas and it would require assistance of USD 1.5 to 1.6 billion in the next three years to address the damage. The survey also revealed that substantial assistance was needed for the following: construction of housing for tsunami-affected population; the private sector such as fisheries and tourism; and infrastructures such as road, water supply and sewerage, and electric power. The Sri Lankan government adopted a policy to obtain the assistance from JICA, the World Bank and the ADB preferentially for rehabilitation and reconstruction from tsunami damage. The government requested the Japanese government for an emergency ODA loan to support short-term infrastructure rehabilitation and reconstruction and emergency finance to the private sector affected by the tsunami.

1.2 Project Outline

The objective of the Project is to secure essential utilities in tsunami-affected areas and obtain investment for small business firms including the fisheries and tourism sectors in Sri Lanka by supporting rehabilitation and reconstruction of small-scale infrastructures and by providing financial assistance to small businesses, thereby contributing to the improvement of the living conditions of the people affected by the tsunami and rebuilding the regional economy.

Loan Approved Amount/ Disbursed Amount	10,006 million yen/10,006 million yen
Exchange of Notes Date/ Loan Agreement Signing Date	June 2005/June 2005
Terms and Conditions	Interest Rate 0.75% Repayment Period 40 years (Grace Period) (10 years) Conditions for Procurement: General untied
Borrower/ Executing Agency	Government of the Democratic Socialist Republic of Sri Lanka/Ministry of Finance and Planning
Final Disbursement Date	September 2008
Feasibility Studies, etc.	ADB, WB, JICA: Joint Needs Assessment I, January 2005 ADB, WB, JICA: Joint Needs Assessment II, March–April 2005
Related Projects	ODA Loan: Pro-Poor Eastern Infrastructure Development Project (L/A: 2006) Grant: Non-project grant (E/N 2005) Other donors: Tsunami Emergency Recovery Program (the World Bank), Tsunami-Affected Areas Rebuilding Project (ADB), North East Community Restoration and Development Project II (ADB)

2. Outline of the Evaluation Study

2.1 External Evaluator

Yumiko Onishi, IC Net Limited

2.2 Duration of Evaluation Study

Duration of the Study: August 2013 – December 2014

Duration of the Field Study: November 24 – December 8, 2013 and March 23 – April 3, 2014

3. Results of the Evaluation (Overall Rating: B[1])

3.1 Relevance (Rating: ③[2])

3.1.1 Relevance to the Development Plan of Sri Lanka

Based on the Joint Needs Assessment by the Sri Lankan government and international donors, the Post Tsunami Recovery Strategy was formulated at the time of the appraisal. The Strategy states that the rehabilitation and reconstruction of economic infrastructures are important in the process of recovering from tsunami damage and places particular importance to

[1] A: Highly satisfactory; B: Satisfactory; C: Partially satisfactory; D: Unsatisfactory.
[2] ③: High; ②: Fair; ①: Low.

national and provincial roads, railway, power, water supply and port. It also stresses the importance of rebuilding the livelihood for tsunami-affected people. It aims to rebuild the livelihood of about 150,000 people, 50% of whom are engaged in fisheries and 45% in tourism.

At the time of the ex-post evaluation, Sri Lanka has recovered from the tsunami damage; however, strengthening the resilience towards disaster remains as a challenge and *Unstoppable Sri Lanka 2020* stresses the importance of strengthening response to natural disaster including climate change. Moreover, infrastructure development remains as one of the priority areas in the national development policy of Sri Lanka, *Mahinda Chintana* (2010). *Mahinda Chintana* aims to provide all the people of Sri Lanka with access to safe water by the year 2020 and indicates needs for more investment in road projects for the country's economic growth. It also designates development of small and medium enterprises as strategic area for economic growth and social development. Therefore, the Project is consistent with the development plan of Sri Lanka.

3.1.2 Relevance to the Development Needs of Sri Lanka

The tsunami of December 2004 hit precisely the impoverished belt of Sri Lanka where the Northern and Eastern areas were affected by 20 years of civil war and the Southern area populated by poor Sinhalese[3]. In these areas, development was slow even before the tsunami, and their limited infrastructures were devastated by the tsunami. To secure the essential utilities of tsunami-affected people, early rehabilitation and reconstruction of infrastructures were urgently required. The tourism sector, a major means of earning foreign currency for the country, was also badly hit, and reconstruction of the sector was important for the macroeconomics of the country. Moreover, most of the affected people are engaged in fisheries, and assistance to small business firms with focus on the fisheries sector to recover their livelihood was needed.

As described in the results of the beneficiary survey in "3.2 Effectiveness," the rehabilitation and reconstruction of small-scale infrastructures were important in rebuilding the lives of the tsunami-affected people. As observed during the field survey, many people use the project infrastructures, which seem to play an important role for reconstruction of small businesses affected by the tsunami. Thus the Project is consistent with the development needs of the country.

3.1.3 Relevance to Japan's ODA Policy

In the Medium-Term Strategy for Overseas Economic Cooperation Operations of Japan, "strengthening assistance for poverty alleviation," "infrastructure development for economic growth," "action on global issues," and "regional development" are important areas of cooperation. Particularly for Sri Lanka, economic infrastructure development, industrial

[3] The percentages of the ethnic groups in the population of Sri Lanka are: Sinhalese, 75%; Tamil, 12%; Moor, 8%; and others, 5% (2012).

development and assistance towards the people living in poverty are priority areas. Thus the Project is consistent with the ODA policy of Japan.

The Project has been highly relevant to the country's development plan, development needs, as well as Japan's ODA policy. Therefore its relevance is high.

3.2 Effectiveness[4] (Rating: ③)

The Project was comprised of two programs: Infrastructure Rehabilitation Program (IRP); and Small Business Revival Program (SBRP). The IRP carried out rehabilitation and reconstruction of small-scale infrastructures in water supply, road, irrigation, power and postal service. The SBRP provided concessional loans through the Participating Financial Institutions (PFIs) to small business firms affected by the tsunami in sectors such as fisheries and tourism.

3.2.1 Quantitative Effects (Operational and Effect Indicators)

(1) IRP

In the IRP, operational and effect indicators were to be established after its inception by studying the evaluation methods and indicators. However, the operational and effect indicators were not established. It would have been ideal to take conditions before the tsunami as baseline value and establish target value with due consideration of the extent of damage and compare baseline value, conditions after the tsunami, target values, and actual values. The reason is that, when the damage from the tsunami is more extensive, it would be more difficult to recover to the original conditions. At the same time, it is presumably difficult to quantify the extent of damage and set the target immediately after the tsunami since reconstruction and rehabilitation of tsunami damages are given the highest priority. It is equally difficult to quantify the situation of tsunami damage after some time has passed. A reconstruction project needs to bring the existing infrastructure facilities and services back to the conditions before the damage. Accordingly, in this ex-post evaluation, the target value was regarded the same as the baseline in principle, and achievement was measured by comparing the actual value against the target. The achievement was calculated by the following formula: actual value/target value (same as baseline) x 100.

a) Water Supply

In the water supply project, there were baseline and target data on beneficiary population of new and reconnection services from the time of the project inception (Table 1). For the reconnection service, the actual value is much higher than the target because of the increase in water supply capacity and expansion of service coverage of the existing system. In contrast, the

[4] Rating is based on the judgment on Effectiveness plus Impact.

beneficiary population of the new service is slightly below the target; however, the total of reconnection and new services is above the target value.

Table 1: Operational and Effect Indicators of Water Supply Project

Indicator	Baseline (2004)	Target (2006: project completion)	Actual (2008: project completion)	Achievement
Beneficiary population	18,053 (reconnection) No data (new)	18,053 (reconnection) 118,772(new)	51,851 (reconnection) 101,312(new)	112%

Source: PIA

Although there are no detailed data on hours of water supply per day before and after the Project, according to the interview with the Project Implementing Agency (PIA), the overall trend has improved because, in some places it was 12 to 18 hours a day before the tsunami and became 24 hours a day after the Project. To verity the effectiveness, impact and sustainability of the Project, a beneficiary survey was conducted at the time of the ex-post evaluation[5]. Out of 200 beneficiary survey samples from the water supply project, only 121 households had access to water supply services at home before the tsunami, which is equivalent to about 60% of the sample. Owing to the Project, more people have gained access to water supply because the Project installed water supply facilities in all the households.

b) Road

In the road project, the average traffic volume, average travel time, and International Roughness Index (IRI) [6] of road sections that include the project area are used for operational and effect indicators. With regard to the average traffic volume, the road sections of the Project were selected where the data before the tsunami and after the Project were available. The data from 2004 before the tsunami were taken as baseline and target values, and the 2010 data which were the most recent data after the project completion were taken as actual values. Then, the two sets of data were compared. As shown in Table 2, the actual values are above the target. As for the average travel time, the beneficiary survey in four sub-project sites covering 200 road users indicated no difference between before the tsunami and after the Project. At the same time,

[5] For the beneficiary survey, 11 locations from sub-projects of the IRP were selected. In each location, 50 interviews (550 in total) were conducted using a questionnaire. The following sub-project sites were selected: one national road in Northern Province; one each from the water supply, national road, power and irrigation projects in Eastern Province; one water supply, two national road, one provincial road and two sites having both the water supply and power projects in Southern Province. Respondents were 61% male and 39% female while their ethnicity makeup was Sinhalese 50%, Tamil 38% and Moor 12%.

For the beneficiary survey of the SBRP, 55 beneficiary enterprises were selected from the list provided by each PFI and interviewed using a questionnaire. The types of businesses covered by the beneficiary survey were as follows: fisheries (four); tourism (five); trade (28); service (eight); manufacturing (five); and others (five). The Project covered 12 Districts; however, the beneficiary survey was conducted in six Districts.

[6] IRI is a common indicator that defines the roughness of the road. It indicates the roughness of specific areas of the selected road. The road is smoother as the index number gets smaller.

it took more than twice the time just after the tsunami to travel the same stretch of the road or using an alternative route compared to the time it took before the tsunami. As seen in traffic volume and travel time, the situation has recovered to the level before the tsunami. IRI has also been improved as a whole.

Table 2: Operational and Effect Indicators for Road Project

Indicator		Baseline (2004)	Target (2006: project completion)	Actual*	Achievement
Average traffic volume on National Highway 2 (vehicle/day)					
	Akurala Bridge	8,274	8,274	13,607	165%
	Magalla Bridge	11,913	11,913	18,545	156%
Average travel time (minutes)*		21	21	21	100%
IRI		8–9	8–9	3–6	Improved

Source: PIA and beneficiary survey
* Data based on the beneficiary survey conducted during the ex-post evaluation.
**Average traffic volume is from 2010, i.e., two years after the project completion. Average travel time is from 2013, i.e., five years after the project completion. International Roughness Index is from 2008, the year of the project completion.

c) Irrigation

In the irrigation project, irrigable area, number of beneficiary households, and average yields are used for operational and effect indicators. Because the Project restored the irrigation channels damaged by the tsunami, the target values of irrigable area and beneficiary population are the same as the baseline, i.e., the values prior to the tsunami. According to the Department of Irrigation (DOI), the actual values are the same as the target; however, in the beneficiary survey, some reported that the irrigable area expanded after the Project and the water access is expanding in new farming areas. The paddy yield at present and before the tsunami (baseline) was looked into in the beneficiary survey, and it was found that the yield increased because of the Project and other factors such as improved agricultural practices.

Table 3: Operational and Effect Indicators for Irrigation Project

Indicator	Baseline (2004)	Target (2006: project completion)	Actual (2008: project completion)	Achievement
Irrigable area (acre)	49,919	49,919	49,919	100%
Beneficiary household	14,639	14,639	14,639	100%
Average yield (kg/acre)*	1,665	1,665	1,880	113%

Source: PIA and beneficiary survey
*Data based on beneficiary survey conducted during the ex-post evaluation. The actual values are from 2013, i.e., five years after the project completion.

d) Electric power

The electric power project has restored electricity services in the tsunami-affected areas and provided new service to the permanent settlement constructed for the tsunami victims (so-called tsunami settlement). For operational and effect indicators, the number of beneficiary households and electricity coverage are used. As shown in Table 4, there are no baseline data on beneficiary households for reconnection. The target value was estimated to be 23,000 households including both reconnection and new beneficiaries[7]. The total beneficiary households of reconnection and new services are 33,000, which is above the target.

In contrast, the average electricity coverage was 50% in Eastern Province before the tsunami. Considering that the electricity coverage was expected to recover to the same level as before the tsunami through the implementation of the Project, the target is 50%, i.e., the same as the baseline. The actual value has improved to 57%, pertaining to the entire Eastern Province, including areas not covered by the Project as well.

Table 4: Operational and Effect Indicators for Electric Power Project

Indicator	Baseline (2004)	Target (2006: project completion)	Actual (2008: project completion)	Achievement
Beneficiary household	Not available	23,000	16,000 (reconnection) 17,000 (new)	144%
Electricity coverage	50%	50%	57%	114%

Source: PIA

e) Postal service

For the postal service project, the number of beneficiaries of the reconstructed post offices can be the operational and effect indicator. At the time of the appraisal, reconstruction of 56 post offices was planned; however, the plan was revised once the Project began and reconstruction of 13 post offices was implemented[8]. The total number of beneficiaries from the 13 post offices is 46,154. If the baseline value is estimated based on the average number of beneficiaries per post office, it is 600,000 as per the original plan and 46,154 for the revised plan. Achievement is 23% against the original plan from the time of the appraisal, but it becomes 100% when compared to the revised plan.

[7] The target value of beneficiary households was estimated when the details of sub-projects were finalized after the project started.

[8] For the details of the revised plan, refer to the section on Efficiency.

(2) SBRP

For the SBRP, the operational and effect indicators in Table 5 were established at the time of the appraisal. The SBRP was implemented to complement a reconstruction fund scheme for small businesses called *Susahana*, which was initiated by the Central Bank of Sri Lanka (CBSL) just after the tsunami. The SBRP fund was provided to the small business firms under the name of the *Susahana* scheme through seven PFIs[9] with the same lending conditions. For the baseline operational and effect indicators of the Project, the actual values of another ODA Loan project named "Small and Micro Industries Leader and Entrepreneur Promotion Project (SMILE) II[10]" from 2003 were used. The External Evaluator calculated the actual values of the Project by collecting data on the cumulative cash recovery rate and non-performing loan ratios from the PFIs taking into account the share of each PFI in SBRP lending. However, it is not possible for some of the PFIs to extract the data related to beneficiaries and their repayment status of only SBRP clients in their data system. In such cases, the actual value pertaining to the lending of PFI as a whole has been taken[11]. In addition, Sanasa Development Bank and Ruhuha Development Bank[12], two of the PFIs, have no data on non-performing loan ratios; therefore, their values are not included in the calculation. Hence, the actual figures indicated below do not necessarily reflect the exact performance of the SBRP.

Table 5: Operational and Effect Indicators of SBRP (Average of PFIs)

Indicator	Baseline	Target (2009: Two years after project completion)	Actual (2012)
Cumulative cash recovery rate	92%	92%	92%
Principal non-performing loanratio (ratio of non-performing sub-loans to the total amount of outstanding loans)	5.6%	5.6%	14.6%
Non-performing loan number ratio (ratio of non-performing sub-loans to the total number of loans)	3.3%	3.3%	14.9%
Beneficiary firms (Total of SBRP)	—	12,000	5,253

Source: Prepared by the External Evaluator

[9] For the list of PFIs of the Project, refer to the section on Sustainability, i.e., "3.5.1 Institutional Aspects of Operation and Maintenance."

[10] The loan agreement was made in 2001. The objectives of the project were as follows: provide low-interest loans to micro, small and medium enterprises to develop and expand their production base; improve their technical and financial management capacity; and improve the financial capacity of the participating financial institutions, thereby contributing to a balanced economic growth of Sri Lanka.

[11] Four out of the seven PFIs were unable to extract the data on the SBRP. Out of the remaining three PFIs, one was unable to extract the cumulative cash recovery rate on the SBRP and used data from PFI's total lending instead.

[12] It is now Regional Development Bank.

As indicated in Table 5, the cumulative cash recovery rate is as per the target. In contrast, the principal non-performing loan ratio and the non-performing loan number ratio have not reached the target. According to the PFIs, because the SBRP is a lending operation for small business firms that have been affected by the tsunami, repayment tends to stagnate more than other loans. Since the SBRP beneficiaries have been affected by an unexpected disaster and their repayment ability differs from the beneficiaries of SMILE II that are on the growth stage, it may be the reason why some of the operational indicators have not reached the target.

The number of beneficiary firms of the SBRP is 5,253, about 40% of the original target of 12,000. At the time of the appraisal, the average loan amount for a beneficiary was estimated to be Rs. 250,000, but the requested loan amount from the small firms were larger and the average loan per beneficiary became Rs. 570,000. In addition, the SBRP has increased the maximum loan amount for tourism-related firms from Rs. 10 million to Rs. 60 million. Only five beneficiaries have taken loans above Rs. 10 million. Nevertheless, the total number of beneficiaries became less than original target because of the larger average loan size.

Based on the interviews with 55 beneficiary firms at the time of the ex-post evaluation, the average sales among the beneficiaries have slightly increased compared to the ones before the tsunami and the number of employees has almost doubled. Although a number of beneficiaries still do not feel that their businesses has recovered to the level before the tsunami, many of the beneficiaries are satisfied with the loans from the Project and feel it has helped rebuild their businesses.

Table 6: Performance of Beneficiary Enterprises

	Before tsunami (2004)	At the time of ex-post evaluation (2013)
Average revenue	Rs. 40,200,655	Rs. 46,599,830
Average no. of employees	7	13

Source: Beneficiary survey

Although non-performing loan ratios and the number of beneficiaries did not reach the target, SBRP loans have helped rebuild and expand the businesses and seem to have had the expected impact.

3.2.2 Qualitative Effects

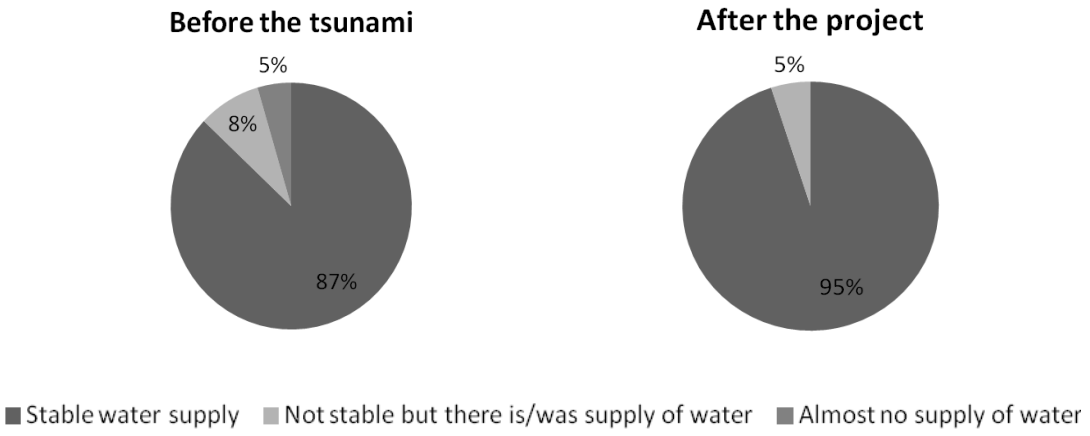
(1) IRP

The beneficiary survey revealed that 67% of the beneficiaries were "highly satisfied" with the Project while 23% was "satisfied"[13].

In the water supply project, the beneficiary survey indicated that more people have gained

[13] Other responses include 6% "somewhat dissatisfied" and 4% "dissatisfied."

access to stable water supply. Among the households who had access to water supply services at their home or community tap before the tsunami, 87% said there was "stable water supply," 8% said "unstable but supply was there," and 5% said "almost no water supply." After the Project, 95% of the beneficiaries responded that there is a stable supply of water (Figure 1).



Source: Beneficiary survey

Figure 1: Comparison of Water Supply Status

Regarding the damage to roads after the tsunami, 92% of the beneficiaries stated that they faced problems in daily travel such as going to work and school and experienced difficulties in everyday life because they were unable to use the road. Comparing the quality of roads before the tsunami and after the Project, 70% of the respondents said "improved," 23% "there is no change," and 6% "worse than before" indicating that the Project has not only repaired the roads but also provided better services. According to the Road Development Authority (RDA) and beneficiaries, in addition to bringing back the roads to the original condition, the Project has widened some of the roads and improved from tar to asphalt surface in many sections. Moreover, some ripple effects are reported. For example, the Project widened a bridge, making it possible for large vehicles to travel, and the road beyond the bridge was paved by other funds after the Project.

In the irrigation project, although 60% of the beneficiaries said that a "sufficient" amount of irrigation water was supplied before the tsunami, it has changed to 72% after the Project, indicating that the Project increased the access to irrigation water.

In the electric power project, out of the households that had access to electricity before the tsunami, 65% of them responded that there was "stable power supply" and 35% "power supply was unstable." However, after the Project, those who responded that there is "stable power supply" have become 100%, indicating that the Project contributed to improving the living

standard.

(2) SBRP

For the SBRP, the beneficiaries' satisfaction towards the loan scheme and the terms and conditions were checked through the beneficiary survey at the time of the ex-post evaluation. Taking into consideration the terms and conditions of the loan and the services of PFIs as well, the beneficiaries were asked "how satisfied are you with SBRP loans?" Out of the 55 sample beneficiary surveyed, 46 (84%) responded that they were "highly satisfied," 8 (14%) were "satisfied" and 1 (2%) "somewhat dissatisfied." Furthermore, the beneficiaries were asked how much the SBRP helped in rebuilding the business in a three-grade evaluation. 43 (78%) said it has "helped very much," 10 (18%) "somewhat helped" and 2 (4%) "did not help much." The business firms who were not satisfied with the loan cited the shortage of loan amount as the reason.

The beneficiaries were also asked whether the facilities were improved after the Project in comparison to those before the tsunami, and it was found that the facilities are mostly the same as before the tsunami or better. Nevertheless, there are some beneficiaries who commented that part of the facilities remain unrepaired because of an insufficient loan from the SBRP. On the other hand, among the 55 sample beneficiaries, it was the first loan for 26 of them and through the loan from the Project, they have become familiar with loan application procedures, and thereafter they have applied for other loans and succeeded in expanding the business. Comparing the performance of the business with that of before the tsunami, 33 beneficiaries (60%) said "it became better," 9 (16%) "no change" and 11 (20%) "it become worse" [14].

3.3 Impact

3.3.1 Intended Impacts

The Project has contributed to reconstruction of the tsunami-affected areas through small-scale infrastructures, particularly to secure essential utilities including provision of water supply and electric power in newly constructed tsunami settlement. In the beneficiary survey, living conditions of the beneficiaries compared to those before the tsunami were asked and the results are shown in Table 7. Including both those who responded "improved a lot" and those who said "improved somewhat," the lives of 59% of the beneficiaries have become better than before.

[14] Two beneficiaries gave no response.

Table 7: Living Conditions of the People Affected by the Tsunami
(Compared to Before the Tsunami)

Response	%
Improved a lot	29%
Improved somewhat	30%
No change	22%
Not recovered	19%
Total	100%

Source: Beneficiary survey
Note: The figures above include the beneficiaries of both the IRP and the SBRP; however, they do not include the beneficiaries who were not directly affected by the tsunami.

As shown above, more than half of the beneficiaries' lives have recovered, and comparing to before the tsunami, they have been improved. No influence in relation to place of living, occupation and ethnicity has been observed between the beneficiaries who feel that their life has recovered and those who feel their life has not recovered.

3.3.2 Other Impacts

(1) Impacts on the natural environment

According to the information provided by the PIAs who have implemented the IRP under the Ministry of Finance and Planning, the executing agency, and PFIs, because the Project has reconstructed the existing infrastructure facilities and businesses, there has been no negative impact on the natural environment. The executing agency has reported that adequate social and environmental consideration was given for selection of sub-projects for the IRP. In the case of sub-loan selections under the SBRP, PFIs ensured that the beneficiary firms have environmental protection license in accordance with the Sri Lankan regulations or the loan officers of PFI have visited the site and confirmed that adequate social and environmental consideration has been taken.

(2) Land Acquisition and Resettlement

There has been no land acquisition and resettlement in the Project implementation because the Project aimed at reconstruction of tsunami-damaged areas.

(3) Unintended Positive/Negative Impact

The IRP did not only act as a reconstruction project but has also widened existing roads and provided water supply and electricity services to people who had no such services before the tsunami. There has not been any report of negative impact from the IRP.

In the IRP, it has been verified that the program has given more impacts than simply reconstructing tsunami-damaged infrastructures and services to the condition before the tsunami. In the SBRP, some of the operational and effect indicators were below the target value; however, as seen in the beneficiary survey results, the loans from the SBRP have contributed to rebuilding and further growth of the beneficiaries. About 80% of the beneficiaries have recovered from the tsunami damage and close to 60% of the beneficiaries' living standards have become better than before because of the Project and various other reconstruction efforts. Other negative impacts are not reported. The Project has largely achieved its objectives. Therefore its effectiveness and impact are high.

3.4 Efficiency (Rating: ②)

3.4.1 Project Outputs

(1) IRP

The Project implemented small-scale infrastructure recovery projects in the sectors of water supply, road, irrigation, power and postal service which contribute to tsunami reconstruction. The IRP's sub-projects were selected based on the selection criteria[15] established at the time of the appraisal. Some of the sub-projects have been added after the Project has started while some others were deleted due to difficulty in implementation. The following are the planned and actual outputs for each sector.

Table 8: IRP Outputs (Planned vs. Actual)

Sector	Planned		Actual	
	Quantity	Sub-projects	Quantity	Sub-projects
Water supply	3,800 households (R) 25,000 households (N)	18	10,914 households (R) 21,325 households (N)	356
Road[16]	National road: 215 km Access road: 170 km Internal road: 195 km	54	National road: 215 km Access road: 83 km Internal road: 85 km	151
	Northeastern Province: 175 km Southern Province: 108km Western Province: 27km	135	Northeastern Province: 171 km Southern Province: 114 km Western Province: 21 km	145
Irrigation	49,919 acres	52	49,919 acres	52
Power	23,000 households (N)	41	16,000 households (R) 17,000 households (N)	28
Postal service	56 post offices	65	13 post offices	59
Total		365		791

Source: PIA
Note: (R): reconnection, (N): new connection.

[15] The following are the criteria for sub-project selection: a) it contributes to rehabilitation/reconstruction of tsunami damage; b) there is no financial assistance from other donors; c) sub-projects complete within 2005; d) cost for each sub-project is Rs. 40 million or less; e) land acquisition required for the project is already completed; and f) contractors and suppliers are selected fairly based on Sri Lankan laws and regulations.

[16] An access road connects the newly established tsunami settlement to a main road. An internal road is constructed within the tsunami settlement.

The outputs of access and internal roads at the appraisal time were tentative because there was no detailed information on the tsunami settlement where both roads were to be constructed. After the Project started its implementation, some of the roads were reconstructed with other funds and eventually the length of the roads became approximately half of the planned length. Regarding the provincial roads, there is no significant difference between the planned and actual outputs. Irrigable areas of the irrigation project and the number of beneficiary households of the water supply project are as described in the section of Effectiveness. In the postal service project, a) the number of post offices has been changed from 56 to 13 because, a review after the project inception revealed that the original project cost allocated to the postal service project was insufficient to reconstruct 56 post offices and b) the number of sub-projects has been reduced from 65 to 59 because Sri Lanka Telecom Ltd was to implement some of the sub-projects.

There is a large difference between the planned and actual total number of sub-projects. This was partly due to the increases in the number of sub-projects in the water supply and national road, but it was mainly the result of dividing the sub-projects selected at the time of the appraisal into multiple sub-projects from the perspective of project implementation efficiency[17]. Other changes are prompted by addition of new water supply sub-projects that were not included in the original plan because the locations of the tsunami settlements were not finalized and a few sub-projects were deleted and changed due to the security situation in the northern and eastern parts of the country.

The geographical spread of the sub-projects on the basis of project cost is not necessarily as planned comparing the appraisal plan (Northern 17.5%, Eastern 41.3% and Southern 31.5%) with the actual (Northern 9%, Eastern 21% and Southern 51%). In the northern and eastern parts of the country, it was difficult to implement the Project because the civil war made it hard to secure contractors. Thus it was inevitable that the geographical spread of the sub-projects was not as planned.

It is fair to say that the change in the outputs was appropriate because the number of sub-projects was changed for project implementation efficiency and situations not foreseen at the time of the appraisal, and the priority was given to the areas where the necessity of the Project was high and it was possible to procure the contractors.

(2) SBRP

The program aimed to provide concessional loans through PFIs to small business firms including fisheries and tourism damaged by the tsunami. The interest rate and the repayment period from the CBSL to the PFIs and the ones from PFIs to small firms were to be the same as the small businesses reconstruction program (*Susahana*) established by the CBSL in February

[17] For example, a sub-project covering a particular stretch of the national road has been divided into several sub-projects of shorter stretches.

2005. Refinancing was given from the CBSL to the PFIs at the interest rate of 3% and repayment period of nine years (grace period of one year). Loans were given from the PFIs to small firms at the interest rate of 6%, the repayment period of three to eight years (grace period of one year) and maximum loan amount of Rs. 5 million (for a firm with a total asset above Rs. 5 million not exceeding Rs. 10 million) or Rs. 10 million (for a firm with a total asset above Rs. 10 million but not exceeding Rs. 20 million)[18].

Table 9: Actual Share of SBRP Loan by Province

Province	District	No. of beneficiary enterprises	Loan amount (Unit: Rs. million)	Share by province (Top: number of beneficiary; bottom: amount of loan)
Southern	Galle	1,702	1,128.5	58%
	Matara	1,000	525.5	66%
	Hambantota	323	95.4	
Eastern	Ampara	727	142.4	28%
	Batticaloa	593	69.5	9%
	Trincomalee	138	21.9	
Western	Kalutara	351	444.2	8%
	Colombo	25	86.9	20%
	Gampaha	22	13.9	
Northern	Jaffna	295	96.3	7%
	Mulattivu	75	36.8	5%
	Vavuniya	1	2.0	
Northwestern	Puttalam	1	0.1	0%
				0%
Total		5,253	2,663.4	100%

Source: Project Completion Report (PCR)

With regard to the number of beneficiary business firms and the share of loan amounts by province, more than 50% are in Southern Province, while the lending in Northern Province is limited. Considering that the damage from the tsunami was worse in the southern and eastern areas and there was a limited branch network of financial institutions because of the civil war in the northern and eastern areas, the province-wise balance in the lending of the SBRP is appropriate. In terms of lending by sector (based on the loan amount), 35% was given to tourism, 15% to fisheries, 35% to trade, 13% to services, 11% to industry, and 4% to others.

At the time of the appraisal, PFI loan officers were expected to provide assistance to borrowers who were not accustomed to obtaining loans from the banks. In the beneficiary survey, 22 beneficiaries (40%) responded that they received assistance from the PFI such as technical advice at the time of SBRP loan application and 33 (60%) of them said that no such assistance was provided. When the beneficiaries were asked what aspect of SBRP loan was

[18] During the implementation of the Project, the ceiling amount of loans for tourism-related businesses was increased from Rs. 10 million at the time of the appraisal to Rs. 60 million.

beneficial (respondents were allowed to give multiple answers), out of the 55 beneficiary firms, 47 (85%) cited the low interest rate and 29 (53%) cited timely disbursement of the loan.

3.4.2 Project Inputs

3.4.2.1 Project Cost

The total project cost according to the appraisal was JPY 12,351 million (out of which JPY 10,006 million was the ODA loan portion) and the actual project cost was JPY 11,350 million (ODA loan portion: JPY 10,006 million); this amounts to the achievement rate of 92% of the plan. Besides the Project, international donors such as the World Bank, ADB, and other bilateral donor organizations provided USD 2,145 million for tsunami reconstruction in Sri Lanka in 2005. Japan's assistance amounted to USD 181 million including the Project and non-project grant. The amount is equivalent to 8% of the total reconstruction fund provided to Sri Lanka, and that makes Japan the largest bilateral donor.

The table below shows the planned and actual cost of the IRP by sector. The actual cost of the national road (including access and internal roads) became 124% of the planned cost. The cost increase is mainly due to price escalation of materials. The cost of the SBRP is as planned. Overall, the outputs of the Project are appropriate to the project cost and it is as planned.

Table 10: IRP Project Cost

Unit: Rs. million

Sector	Planned	Actual	Achievement
Water supply	1,472	1,474	100%
National, access and internal roads	1,730	2,141	124%
Provincial road	705	660	94%
Irrigation	184	182	99%
Power	2,333	2,320	99%
Post	249	201	81%
Total	6,673	6,978	105%

Source: PIA

3.4.2.2 Project Period

The Project started in January 2005[19]. Planned and actual project periods are shown below. The completion of the IRP was defined as the completion of all sub-projects; for the SBRP, the final disbursement from JICA to the CBSL was defined as its completion[20].

[19] The Loan Agreement for the Project was signed in June 2005; however, expenditures related to the Project after January 1, 2005 were financed retroactively.

[20] At the time of the appraisal, the planned Project period was up to March 2007. However, after the Project was reviewed in 2006, the period and completion for each program were clearly defined.

Table 11: Planned and Actual Project Periods

Program	Planned	Actual	Comparison
IRP	March 2006	August 2008	293%
SBRP	March 2007	December 2006	89%

Source: PIA

The IRP completed 29 months later than the original plan mainly for the following three reasons.

- Some of the facilities related to access roads, water supply and electric power were constructed in the tsunami settlements. The IRP was delayed partly because it took time for other government agencies to decide the locations of the tsunami settlements and for the construction.
- To secure transparency and fairness in procurement procedures, the Project employed competitive bidding for all its packages. At the time of the appraisal, it was expected to be a swift reconstruction work, and therefore, the project period for IRP was set comparatively shorter than in relation to the time taken for competitive bidding procurement process. Nevertheless, after the tsunami, PIA staff became busy and coupled with the shortage of contractors, it took more time than expected for procurement process, resulting in delay in project implementation. The delay was basically caused by the fact that originally planned project period was too short; however, in this type of project where quick reconstruction work was expected, if procurement process which takes longer compared to other procurement methods such as direct contracting was selected, an alternative arrangement should have been taken in order to implement the project within the planned period.
- After the tsunami, a number of reconstruction projects started in the country and there was a shortage of materials such as stones and bitumen which also caused delays for the Project.

The SBRP was completed earlier than planned because there were many loan applications from small businesses that were affected by the tsunami.

Although caused by external factors, the delay in IRP implementation was substantial. Therefore, the project period was longer than planned.

Although the project cost was within the plan, the project period exceeded the plan. Therefore, the efficiency of the Project is fair.

3.5 Sustainability (Rating: ②)

3.5.1 Institutional Aspects of Operation and Maintenance

The Ministry of Finance and Planning, i.e., the executing agency, coordinated the entire Project. The ministry was to strengthen the Project Management Unit of the "Small-scale Infrastructure Rehabilitation and Upgrading Project" and the "Small-scale Infrastructure Rehabilitation and Upgrading Project II," a unit that had been already established at the time of the appraisal, into the Project Management Coordinating Unit (PMCU) to undertake the overall management of the Project as well as two other ongoing projects.

(1) IRP

The table below shows the responsible agencies for the operation and maintenance (O&M) of the IRP.

Table 12: Institutions Responsible for O&M of IRP

Project	Responsible Agency
Water supply	National Water Supply and Drainage Board (NWSDB)
National road	Road Development Authority (RDA)
Access and internal road	Local governments
Provincial road (Northern)	Northern Province Road Development Agency (NPRDA)
Provincial road (Eastern)	Eastern Province Road Development Agency (EPRDA)
Provincial road (Southern)	Southern Province Road Development Agency (SPRDA)
Provincial road (Western)	Western Province Road Development Agency (WPRDA)
Irrigation	Department of Irrigation (DOI)
Electric power	Ceylon Electricity Board (CEB)
Postal service	Department of Post (DOP)

The project on access and internal roads in the tsunami settlement was implemented by the RDA; however, after the construction of the roads, the responsibility of O&M was handed over to respective local governments. The NPRDA implemented the project on provincial roads in the northern and eastern parts. However, the Province split into the Northern and Eastern Provinces, and the Provincial Road Development Agency in the respective new provinces is in charge of O&M now. Regarding the other projects, the PIAs that implemented the projects handle their O&M. Moreover, according to a survey of the institutional arrangement for O&M of each PIA at the time of the ex-post evaluation, the DOI had only 1,121 personnel as opposed to the prescribed posts of 1,709 (66%) for O&M. To maintain irrigation canals, beneficiary farmers are mobilized under the supervision of the DOI field staff because the DOI has severe shortage of personnel particularly at the field level. According to the DOI, under such arrangement, there are no major problems in O&M. Other O&M agencies have not reported problems such as severe shortage of personnel or institutional arrangements for O&M.

(2) SBRP

The CBSL executed the SBRP as its PIA under the PMCU. PFIs were to be selected under the same selection criteria as "SMILE III" and eventually selected based on the following criteria established at the time of the appraisal.

- Surplus in at least two of the most recent years
- Non-performing loan ratio of less than 10% in SMILE III and non-performing loan ratio of less than 15% for the total portfolio
- A debt-coverage ratio (ratio of "profit for the year" to "sum of interest payment and repayment maturing in the year") of at least 1.25:1.

Nevertheless, to include the financial institutions that did not participate in SMILE III, "non-performing loan ratio of less than 10% in SMILE III" was changed to "non-performing loan ratio of less than 10% in the financial institutions' portfolio for small- and medium-enterprises." Out of the ten institutions that expressed their interest, the following seven that met the selection criteria took part in the SBRP as PFI (* indicates the institution that also participated in SMILE III).

- Bank of Ceylon (BOC)*
- Commercial Bank of Ceylon (CBC)*
- DFCC Bank*
- National Development Bank (NDB)*
- Sampath Bank*
- Sanasa Development Bank
- Ruhuna Development Bank (now Regional Development Bank) (RDB)*

O&M of sub-loans are the responsibility of each PFI that has offered the loan. O&M of the SBRP such as loan recovery in PFIs are conducted in the same manner as other loans, and the institutional arrangements for maintenance are in place.

Some of the institutions are short of personnel in the IRP and the SBRP; however, initiatives have been taken to address the shortage, and the institutional aspects of O&M face no major problems.

3.5.2 Technical Aspects of Operation and Maintenance

(1) IRP

Based on the interviews with O&M agencies, technical skills required for O&M of the Project are not different from other tasks and there are no problems of skills and capacity among the personnel in day-to-day operations. Some of the agencies conduct routine trainings to upgrade the technical skills of their personnel. A few agencies are revising the maintenance

manuals as well.

(2) SBRP

Loan appraisal and recovery of the SBRP in PFIs are mostly under the responsibility of their branches. Loan recovery of the SBRP is the same as other loan schemes of PFIs, and the personnel have sufficient knowledge on it. Manuals on loan recovery have been developed and are used appropriately by the personnel. Continuous trainings to upgrade the technical capacity of the personnel are also conducted.

The technical standards of the personnel of O&M agencies and PFIs are sufficient, maintenance manuals are available, and there seems to be no major problems with regard to technical aspects.

3.5.3 Financial Aspects of Operation and Maintenance

(1) IRP

It is the responsibility of O&M agencies to secure the O&M budget for sub-projects of the IRP. Table 13 shows O&M budget allocation and expenditures for some of the O&M agencies in 2012. In the interviews with the O&M agencies, shortage of O&M budget in general was pointed out. The budget implementation rate in a few agencies is 100%; however, some commented that the allocated budget itself is not sufficient. The agencies whose budget implementation rate is low have pointed out that they are unable to use the budget within the fiscal year because the budget is not released timely. Therefore, it is fair to say that the financial aspects of O&M face minor issues.

Table 13: O&M Budget Allocation and Implementation by Agency (2012)

Unit: Rs. million

Agency	Allocation	Expenditure	Implementation rate
NWSDB	17,241	15,924	92%
RDA	4,835	4,807	99%
DOI	650	519	80%
CEB	37,305	36,922	99%
SPRDA	525	261	50%
WPRDA	400	400	100%
EPRDA	50	55	110%

Source: O&M agencies

(2) SBRP

No major problems have been observed in the financial aspects of PFIs. The government regulations require financial institutions in Sri Lanka to maintain the capital adequacy ratio (CAR) of at least 10%, and all the PFIs of the program have the CAR of more than 10% (see Table 14). A survey by Fitch Ratings, a financial rating firm, shows that the average return on

assets (ROA) for the financial sector in Sri Lanka in 2010 was 1.8% while the non-performing asset ratio (NPA) was 5.4%. The ROAs of Sampath Bank and Sanasa Development Bank are below the sector average while the NPA of Sampath Bank is above the average. Meanwhile, the rating for Sampath Bank is AA-, and the one for Sanasa Development Bank is BB+ Positive, and it is fair to say that their financial status is generally stable.

With regard to the beneficiaries of the SBRP, as described in the section on Effectiveness, a comparison of sales between before the tsunami and at the time of ex-post evaluation shows that their average sales have increased by 16% from Rs. 40,200,655 to Rs. 46,599,830. Some beneficiaries are still struggling to rebuild their businesses, but most beneficiaries seem to be financially stable.

Table 14: Financial Status of PFIs

Unit: %

PFI	CAR		ROA		NPA		Rating
	2011	2012	2011	2012	2011	2012	
BOC	11.6	11.4	2.1	2.1	2.1	2.8	AA+ Stable
CBC	13.0	13.9	1.9	2.1	2.1	1.8	AA Stable
DFCC	30.0	24.6	12.3	3.2	6.3	4.6	AA- Stable
NDB	11.3	12.4	1.7	1.9	1.4	1.3	AA- Stable
Sampath	11.5	13.6	1.6	1.7	8.1	5.6	AA- Stable
Sanasa	17.8	16.4	3.6	1.3	NA	NA	BB+ Positive
RDB	12.0	NA	3.6	NA	NA	4.3	BBB+

Source: PFIs

3.5.4 Current Status of Operation and Maintenance

(1) IRP

Based on the findings from the interviews with O&M agencies and the field visits, most infrastructure facilities of the IRP are operated and maintained properly. In contrast, some of the access and internal roads under the responsibility of the local governments are not maintained properly because of shortage in budget. In the beneficiary survey, 76% of the access and internal road users have responded that they are "not properly maintained"[21].

In the road project, some substantial upgrading was made after the Project was implemented, and the condition of the road is different from just after the Project completion, and the irrigation project in Eastern Province has gone through more reconstructions because of repeated flood damages after the Project.

It is fair to say that the status of O&M faces a few issues because minor problems are observed in the access and internal roads maintained by the local governments.

[21] The roads are not properly maintained possibly because of the shortage of budget and low priority given to the maintenance by the local governments.

(2) SBRP

In the SBRP, a revolving fund account was to be established using the proceeds of sub-loans and re-lending was to be made for private sectors in the tsunami-affected areas. The revolving fund was operated with the same conditions as the SBRP from March 2006 to June 2007 and the loans were extended to small business firms in the tsunami-affected areas. For loans from the revolving fund, People's Bank took part as a PFI in addition to BOC, CBC, Sanasa Development Bank and RDB that participated in the SBRP. People's Bank was added as a PFI after it was confirmed that it met the PFI selection criteria. Using the balance of Rs. 627.5 million from the SBRP as capital, the revolving fund provided 62 sub-loans amounting to Rs. 122.7 million during its operational period.

Institutional arrangements for O&M of the Project are in place and no major problems have been observed in technical aspects. However, the O&M agencies face minor issues in securing budget. Furthermore, some of the access and internal roads are not maintained properly because of budget shortage in the local governments. Therefore, the sustainability of the Project effect is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The Project is consistent with the development plan and needs of Sri Lanka after the tsunami and is in line with the ODA policy of Japan. Small-scale infrastructures reconstructed by the Project are similar to or better than those before the tsunami while the lives of more than half the Project beneficiaries have recovered to the same level as before the tsunami or have become better than the pre-tsunami level. Some benefits are seen such as some households that had no access to water supply and power before the tsunami gained access to them through the Project. In the Small Business Revival Program, while the non-performing loan ratios of the beneficiary firms are below the target, it is confirmed that the loans from the Project have helped rebuild the businesses. The effectiveness and impact of the Project are high because the Project has contributed to improving the livelihood of the tsunami-affected population and the economic recovery of the affected areas. The efficiency of the Project is fair because, although the project cost was as planned, there was a substantial delay in the implementation period of the Infrastructure Rehabilitation Program. In general, no major problems have been observed in the institutional and technical aspects of the operation and maintenance system. However, there are minor issues in the financial aspect. Therefore, the sustainability of the Project effect is fair.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

Regarding the sustainability of the Project, shortage in budget among O&M agencies of the IRP was identified. Because of shortage of finance and low priority on maintenance towards access and internal roads that the local governments look after, maintenance is not properly carried out on some of the roads. To carry out the required maintenance with limited financial resources, it is recommended to discuss and find out a solution with the local governments.

4.2.2 Recommendations to JICA

None.

4.3 Lessons Learned

Because the Project supported reconstruction in tsunami-affected areas, there are no specific lessons that can be applied to ordinary projects targeting the development of infrastructure and small businesses. However, the following is a lesson learned with regard to setting project period and selecting procurement procedures for a reconstruction project that particularly requires quick response within one to two years after the disaster.

Setting project period and selecting procurement procedures for a reconstruction project: The Project has employed competitive bidding for all the packages of IRP (infrastructure reconstruction component). At the time of the appraisal, since a swift reconstruction work was expected, the project period was set comparatively shorter in relation to the time taken for ordinary competitive bidding process. However, after the tsunami, many infrastructure reconstruction projects were implemented at the same time in Sri Lanka, resulting in shortage of materials and contractors. In addition, PIA staff became busy and it has taken more time for procurement process, resulting in substantial delay. Therefore, it is desirable to set project period with due consideration to the conditions in disaster-hit areas when employing competitive bidding while the project areas are geographically widespread. Furthermore, according to the *Handbook for Procurement under Japanese ODA Loans* (April 2012), procurement procedure other than competitive bidding[22] can be employed when "the number of qualified contractors, suppliers or manufacturers is limited" and when it is "inappropriate to follow international competitive bidding procedures, e.g. in the case of emergency procurement," and IRP of the Project is in line with these conditions. For the future reconstruction project immediately after the disaster, considering the need for swift assistance while minimizing the burden on the executing agency, it is desirable to select an appropriate procurement procedure by explaining to the executing agency the advantages and disadvantages of procurement procedure other than competitive bidding such as direct contracting with due consideration to securing the quality of the construction.

[22] Limited international competitive bidding, international shopping, and direct contract.

Comparison of the Original and Actual Scope of the Project

Item	Original	Actual
1. Project Outputs		
IRP		
a) Water supply	3,800 households (R)*	10,914 households (R)
	25,000 households (N)*	21,325 households (N)
b) Road		
National road	215 km	As planned
Access road	170 km	83 km
Internal road	195 km	85 km
Northeastern provincial road	175 km	171 km
Southern provincial road	108 km	114 km
Western provincial road	27 km	21 km
c) Irrigation	49,919 acres	As planned
d) Power	Data not available	16,000 households (R)
		17,000 households (N)
e) Postal service	13 post offices	As planned
SBRP		
Number of beneficiary firms	12,000	5,253
2. Project Period	January 2005 – April 2007 (28 months)	January 2005 – August 2008 (44 months)
3. Project Cost		
Amount paid in Foreign currency	1,401 million yen	1,042 million yen
Amount paid in Local currency	10,950 million yen	10,308 million yen
	(10,950 million rupees)	(9,634 million rupees)
Total	12,351 million yen	11,350 million yen
Japanese ODA loan portion	10,006 million yen	10,006 million yen
Exchange rate	1 rupee = 1 yen (As of February 2005)	1 rupee = 1.07 yen (Average between January 2005 and August 2008)

*(R): reconnection; (N): new connection

People's Republic of Bangladesh

Ex-Post Evaluation of Japanese ODA Loan
"Eastern Bangladesh Rural Infrastructure Development Project"

External Evaluator: Ryujiro Sasao, IC Net Limited

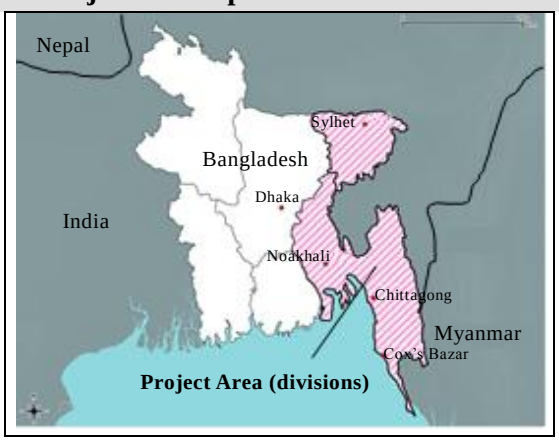
0. Summary

This project aimed to improve access to economic opportunities and social services for poor people living in economically disadvantaged rural areas in eastern Bangladesh by developing rural infrastructure.

The implementation of this project was in line with the development plan of the People's Republic of Bangladesh, the development needs of the project area, and Japan's ODA policy. Therefore its relevance is high. Regarding the effectiveness of the project, the traffic volume of rural roads that were paved under the project increased significantly, travel time on them has been shortened, and access to various facilities has improved. Shipments of agricultural produce have also increased. Local residents have shown high levels of satisfaction with other facilities that have been developed or improved under the project, including rural markets known as Growth Centers (GCs), Union Parishad Complexes (UPC), and boat landing stages/ghats. Expected positive impacts of the project have been clearly ascertained through a beneficiary survey, as well as an Effect Monitoring and Evaluation Survey that was conducted as an incidental to this ODA loan project. These impacts include more employment opportunities and increased income for local residents, and an improved status of rural women. For all these reasons, both the effectiveness and the impact of the project are high. While the project cost stayed within the planned budget, the project period exceeded the plan. Therefore the efficiency of the project is fair. No major structural problems or technical problems have been observed in the operation and maintenance of this project but some financial problems have been observed. Hence, the sustainability of the project impact is fair.

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

1. Project Description



Project Location

An improved road in Noakhali District

1.1 Background

In Bangladesh, the poor account for about half of the total population, nearly 80% of which live in rural areas. Poverty in rural areas can be alleviated by promoting agriculture and aligning rural markets with their urban counterparts for increased economic activity. A major obstacle to this solution is the inadequacy of basic infrastructure such as roads, water, and electricity. Unpaved roads can remain muddy and dotted with puddles for several days after rain in Bangladesh, which has annual rainfall more than twice that of Tokyo. This hampers traffic along these roads. In addition, underdeveloped roads hinder the development of other infrastructure components such as GCs, water, and electricity. Hence, the development of roads is of particular importance among the infrastructure components.

The management of road networks in Bangladesh is under the jurisdiction of (i) the Roads and Highways Department of the Ministry of Road Transport and Bridges, which is responsible for arterial roads; and (ii) the Local Government Engineering Department (LGED) of the Ministry of Local Government, Rural Development and Cooperatives (MLGRDC), which is responsible for rural roads. Through public works funded by various sources including aid funds from abroad, arterial roads, which come under the jurisdiction of the central government, are progressively paved, but rural roads, which are under the jurisdiction of LGED, are not. For example, only 26% of Union roads are paved as a national average.[1]

1.2 Project Outline

This project was aimed at improving access to economic opportunities and social services for poor people living in economically disadvantaged rural areas in eastern Bangladesh by developing rural infrastructure, thereby contributing to reducing the economic and social disparities between urban and rural areas.

[1] The 2004 figure (at the time of project appraisal by JICA).

Loan Approved Amount/ Disbursed Amount	11,345 million yen/11,193 million yen
Exchange of Notes Date/ Loan Agreement Signing Date	March 2005/March 2005
Terms and Conditions	Interest Rate 0.9% Repayment Period 30 years (Grace Period) (10 years) Conditions for Procurement: General untied
Borrower/ Executing agency	The Government of the People's Republic of Bangladesh/ Local Government Engineering Department (LGED) of the Ministry of Local Government, Rural Development and Cooperatives
Final Disbursement Date	July 2011
Main Consultant (over 100 million yen)	Engineering and Planning Consultant (Bangladesh)/ Devconsultants Limited (Bangladesh)/Divine Associates Ltd. (Bangladesh)/Katahira & Engineers International (Japan)/WSP International (UK) (JV)
Related Projects	(Related ODA Loan Projects) The Northern Rural Infrastructure Development Project (1999); the Greater Faridpur Rural Infrastructure Development Project (2001) (Technical Cooperation Projects) The Rural Development Engineering Center Setting-up Project (2003–2006), Phase II of the Rural Development Engineering Center Setting-up Project (2007–2011) (Projects by Other Agencies) The Rural Infrastructure Improvement Project (ADB); the Rural Infrastructure Improvement Project and Rural Infrastructure Strategy Study (World Bank)

2. Outline of the Evaluation Study

2.1 External Evaluator

Ryujiro Sasao, IC Net Limited

2.2 Duration of Evaluation Study

The External Evaluator performed the following evaluation study in the course of this ex-post evaluation:

Duration of the Study: August 2013 – December 2014

Duration of the Field Study: October 19 – November 4, 2013; March 27–28, 2014; April 9–19, 2014

2.3 Constraints during the Evaluation Study

Information on the three operation and effect indicators for rural roads were partly lacking for the purposes of effectiveness assessment; some historical data were not maintained at the

executing agency, and calculating some indicator figures were beyond the agency's capacity. The authority to operate and manage GCs, as many as 67 of which were improved under this project, had been transferred from the executing agency to local government offices. The transfer of the authority and the numerousness of GCs made it difficult for the executing agency to conduct a survey on all GCs after project completion. Therefore, the External Evaluator was only able to obtain part of the actual data on the operation and effect indicators for GCs.

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

3.1 Relevance (Rating: ③[3])

3.1.1 Relevance to the Development Plan of Bangladesh

The Poverty Reduction Strategy Paper (PRSP)[4] was formulated in 2005 at around the time of project appraisal. The PRSP sets out four strategic blocks. One of them is "boosting critical sectors for pro-poor economic growth." This block covers agricultural and rural development and infrastructure development. PRSP II, formulated in October 2008, identifies five strategic blocks, one of which is also "boosting critical sectors for pro-poor economic growth."

The national development strategy at the time of the ex-post evaluation was the 6th Five Year Plan (2011–2015) formulated in July 2010. The Plan is aimed at accelerating growth and reducing poverty. Chapter 7 of the Plan (Managing Regional Disparities for Shared Growth and Sustained Poverty Reduction) focuses on, among other issues, rural development in underdeveloped areas. It stresses the need for the development of infrastructure, including rural roads, and calls for allocation of the Plan's resources.

Moreover, "the Outline Perspective Plan of Bangladesh 2010–2021[5]" was approved by the Planning Commission in May 2012. This longer-term development plan recognizes that it is important to develop rural transport infrastructure and revitalize GCs for the regional economy. It stresses the need for constructing and maintaining rural road networks and GCs.

As seen above, this project remained unwaveringly consistent with some of the key focus areas of a series of Bangladeshi government's development plans since the time of project appraisal. Therefore, this project has been highly relevant to the national development plan.

3.1.2 Relevance to the Development Needs of Bangladesh

At the time of project appraisal, whether roads were paved or not paved was a major factor affecting economic and social activities in eastern Bangladesh, a region with a high percentage of the poor[6] and prone to cyclones and floods[7]. The poor conditions under which many rural

[2] A: Highly satisfactory; B: Satisfactory; C: Partially satisfactory; D: Unsatisfactory.
[3] ③: High, ② Fair, ① Low.
[4] The 5th Five Year Plan covered the period 1998–2002. The 6th Five Year Plan started in 2011. The transitional period was covered by the PRSP.
[5] The 6th Five Year Plan was drawn up in line with this Perspective Plan.
[6] A 2001 study by the Food and Agriculture Organization (FAO) divides the 415 upazilas across the country into four groups according to the poverty rate. Some 40% of the upazilas covered by this project belonged to Group IV or the poorest group.

roads and GCs in this region were placed hindered the functionality of the transport and trade networks there. For example, highly congested and unsanitary GCs meant that agricultural products rotted easily and had to be disposed of. Poor road conditions also adversely affected the transport of agricultural products, especially in the rainy season, meaning rural infrastructure development was an urgent issue for eastern Bangladesh compared to other parts of the country. Road improvement was therefore a high priority issue for the region covered by this project. The project selected, as a target, those roads that were expected to have a significant impact by carrying out pavement work.

The ex-post evaluation study found that the actual traffic volume of completed roads exceeded the target set at the time of project appraisal in all major categories including automobiles, suggesting that potential traffic demand for these roads were higher than expected (see the section on "Effectiveness" for details). Interviews with officials at the executing agency in the field study found no major external factors that could have affected the significance of this project.

In light of the above, this project remained consistent with the development needs of Bangladesh from the time of project appraisal to the time of ex-post evaluation.

3.1.3 Relevance to Japan's ODA Policy

The Japanese government's Country Assistance Program for Bangladesh, formulated in 2000, identifies, as one of the four strategic focuses, agricultural and rural development and improved agricultural productivity. It stresses the importance of rural infrastructure development as part of efforts in this field.

JICA's Medium-Term Strategy for Overseas Economic Cooperation Operations, formulated in 2000, emphasizes rural development and support for the poor among the priority areas for JICA's assistance for Bangladesh. JICA's new Medium-Term Strategy, developed in 2005, identifies agricultural and rural development that contributes to direct poverty reduction measures, as a priority area for JICA's assistance for the country in the subsection on Bangladesh in Section 4: Priority Regions and Regional and Country Policies.

Therefore, this project corresponds to the important issues of Japan's ODA policy for Bangladesh and is highly in conformity with Japan's ODA policy.

In light of the above, this project has been highly relevant to Bangladesh's development plan, development needs, as well as Japan's ODA policy. Therefore its relevance is high.

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[7] The annual precipitation for four districts--Chittagong, Cox's Bazar, Noakhali, and Sylhet--in the two divisions covered by this project ranged from 2,186 mm to 4,113 mm in 2003, the year before the project appraisal was conducted, and from 2,808 mm to 3,461 mm in 2009, according to the Bangladesh Bureau of Statistics. By comparison, the annual precipitation is approximately 2,148 mm for Dhaka, 1,718 mm for Japan, and 880 mm for the world average, according to the Bangladesh Meteorological Department and the Ministry of Land, Infrastructure, Transport and Tourism of Japan.

3.2 Effectiveness[8] (Rating: ③)

3.2.1 Quantitative Effects (Operation and Effect Indicators)

This project was implemented in Chittagong Division in southeastern Bangladesh (five of the 11 districts, namely Chittagong, Noakhali, Cox's Bazar, Feni, and Laxmipur) and Sylhet Division in northeastern Bangladesh (all four districts). It was designed to create synergy by upgrading both Upazila roads (UZRs) and Union roads among other types of roads while developing or improving incidental rural infrastructure (boat landing stages/ghats, UPCs, GCs, etc.) in these nine districts.

The External Evaluator assessed the level of attainment of the expected project outcome: improved access to economic opportunities and social services for poor people living in rural areas in eastern Bangladesh, in light of the four expected outputs: (1) the upgrading of rural roads, (2) the improvement of GCs, (3) the construction of UPCs and the LGED Functional Building, and (4) the improvement of boat landing stages/ghats.

(1) Upgrading of Rural Roads

The table below shows the target and actual figures of predetermined indicators for operations and effects for rural roads. The achievement rate for the three indicators clearly exceeded 80%[9].

Table 1: Operation and Effect Indicators for Rural Roads

Operation and effect indicator	Baseline (2004)	Target (At planned completion: 2009)	Actual (At completion: 2011)	Actual (2013)
% of unpaved UZRs in 9 districts	44%	20%	N/A	23%
No. of UZR beneficiaries	-	4.3 million	4.09 million*2	N/A*3
Travel cost/km (bicycle)*1	1.61 taka/km	0.82 taka/km	0.82 taka/km	N/A*4

Source: Appraisal documents and the executing agency

Note: *1. An indicator to measure the effect of saving maintenance cost for each transportation mode based on the International Roughness Index (IRI). Taka is the Bangladeshi monetary unit. As of June 2014, one taka equaled approximately 1.34 yen.

*2. "Beneficiaries" refers to residents in the project area who benefit from the project directly or indirectly. Their number is calculated by multiplying the calculated total area within one kilometer from the roads upgraded under the project by the standard value per unit area (population density). The actual figure for the population of beneficiaries, i.e. 4.09 million, accounts for approximately 11% of the total population of the two divisions where this project was implemented.

*3. This is because the latest population density is not available; however, considering the increase in recent years, it must be more than the 2011 level.

*4. The value for 2013 is not available because this data is calculated by a third-party expert under contract on an irregular basis.

Of the predetermined operation and effect indicators, the percentage of unpaved Upazila roads (UZRs) is slightly worse than the target. The number of beneficiaries is also almost at the original target level. Data on annual average daily traffic (AADT) by type of vehicle is provided

[8] Sub-rating for Effectiveness is to be evaluated with due consideration of Impact.

[9] The percentage of unpaved Upazila roads at the completion of the project in 2011 is not known but considered to be more or less the same as the 2013 level because 2011 was the final year of the project implementation period.

in Annex 1: Effect Indicators. AADT exceeds the original target for all types of vehicles and in terms of the number of passengers. In 15 selected road sections[10], traffic volume further increased from the level at project completion[11], according to the executing agency. The average travel speed for buses, for example, jumped from 15 km per hour before the project to 30 km per hour after the project[12], according to the same agency.

The project attained the original targets for travel cost savings for bicycles as shown in Table 1. For other types of vehicles as well, the project achieved the targets that had been set at the time of appraisal.

Quantitative information on project effectiveness also comes from the report on the Effect Monitoring and Evaluation Survey (Final Report on Effect Monitoring and Evaluation, 2009).[13] According to the report:

- The average number of passengers per motor vehicle on days, when a market is open, grew 56% from 2004 to 2009.
- The average amount of freight transported per vehicle on days, when a market is open, and other days rose 201% for the same period.

(2) Improvement of GCs

The target and actual figures for the operation and effect indicators for GCs are given below:

Table 2: Operation and Effect Indicators for GCs

Operation and effect indicator*1	Baseline (2004)*1	Target (At completion; 2009)*1	Actual (At completion; 2011)*2
No. of temporary shop owners in GCs (by gender)	459 men 12 women	1,000 men 35 women	N/A
No. of permanent shop owners in GCs (by gender)	61 men 2 women	130 men 8 women	N/A

Note: *1. The indicators below present the average for all GCs that have been improved under the project.
*2. The authority to operate and manage GCs had been transferred from the executing agency to local government offices. The sheer number of GCs (67 GCs) made it difficult for the executing agency to obtain the actual figures.

The External Evaluator was unable to compare the actual figures against the baseline and target figures in terms of the operation and effect indicators as shown above. The number of shops did increase, however, according to the Final Report on Effect Monitoring and Evaluation (2009) mentioned above. As described on page 63 of the 2009 report, a sample survey of ten selected GCs shows the number of permanent shops rose from 434 in 2004 to 621 in 2009, while the number of temporary shops grew from 314 to 358 during the same period. Likewise, the daily

[10] These 15 road sections have been selected with geographical distribution taken into account so that they best represent the project area as a whole in a baseline survey by the consultant who was in charge of the Effect Monitoring and Evaluation Survey that will be described later.
[11] AADT rose 43% on average for the 15 road sections between 2009 and 2012.
[12] Likewise, the travel speed of rickshaws soared from 3 km per hour to 10 km per hour, according to an estimate based on the results of the questionnaire survey in Cox's Bazar.
[13] This survey was incidental to the ODA loan project, meaning that it was financed by ODA loan funds. It was conducted under contract by an external evaluator (consultant) in 2004 (baseline) and 2009 (after the project).

average number of visitors to these GCs also increased from 2,718 to 3,959, a gain of 45%.

This project was aimed at creating synergy through the integrated design of GCs and rural roads. According to the executing agency, improved road networks allowed farmers to deliver their products farther to consumers more quickly, which meant higher selling prices for them.[14]

(3) Construction of UPCs and the Extension of LGED Functional Building

No operation and effect indicators were predetermined for UPCs or the LGED Functional Building. Moreover, the field study could not obtain quantitative information. Qualitative effects for these facilities will be described in the next subsection (see 3.4.1 for the achievements in facility development and improvement).

(4) Improvement of Boat Landing Stages/Ghats

Although no operation and effect indicators were predetermined for boat landing stages/ghats, the number of boats that used these facilities edged up between 2004 and 2009, according to the Final Report on Effect Monitoring and Evaluation (2009).[15] A survey that was conducted on 11 boat landing stages/ghats in Chittagong Division on a day, when a market is open, described on pages 72–73 of the report, shows that the average number of boats that used these facilities increased from 307 to 324. Another similar survey on seven boat landing stages/ghats in Sylhet Division indicates that the number grew from 713 to 732 during the same period. At a boat landing stage/ghat in Sylhet Division, the average stevedoring time decreased from 83 minutes in 2004 to 53 minutes in 2009. The average stevedoring cost per ton also fell from 85 taka to 55 taka during the same period.

The project's achievement rate for overall quantitative effects is estimated at more than 80%.[16]

3.2.2 Qualitative Effects

(1) Upgrading of Rural Roads

The External Evaluator conducted a beneficiary survey on residents near roads covered by this project in four districts--Sylhet, Noakhali, Chittagong, and Cox's Bazar--by way of random sampling[17]. A total of 80 residents responded to each survey[18]. They lived along or near roads

[14] Higher prices for agricultural produce were also ascertained by a questionnaire survey of beneficiaries.

[15] Of the 18 boat landing stages/ghats that were covered by this project, 15 had been fully upgraded by the time the survey was conducted in December 2009; the other three facilities were being upgraded.

[16] Operation and effect indicators had been predetermined beforehand as far as rural roads and GCs were concerned. The achievement rate for the operation and effect indicators for GCs is estimated to be more or less 50%. However, the External Evaluator concluded the project's overall achievement for these indicators exceeds 80% as the roads accounted for the overwhelming proportion of the project cost. In fact, the ratio of the cost for GCs to the cost for roads was approximately 3 to 100.

[17] The roads covered by this project are spread extensively in eastern Bangladesh. These four districts were selected for two reasons. First, they are distributed widely in geographical terms. Second, the total length of such roads in these districts is longer than those in other districts. The random sampling was based on the systematic sampling method.

that had been upgraded under the project.

On the direct benefits of the project, the respondents answered as shown below:

Table 3: Summary of Beneficiaries' Answers to Questions on Direct Project Benefits

Question	Sylhet	Noakhali	Chittagong	Cox's Bazar
1. Has the project resulted in more shipments of goods (primarily agricultural produce)? (%)	Yes: 96 No: 3 Don't know: 1	Yes: 86 No: 3 Don't know: 11	Yes: 98 No: 1 Don't know: 1	Yes: 100 No: 0 Don't know: 0
2. Has the smoother traffic due to the project supported the transport of goods to farther places? (%)	Yes: 89 No: 6 Don't know: 5	Yes: 54 No: 4 Don't know: 43	Yes: 91 No: 1 Don't know: 8	Yes: 100 No: 0 Don't know: 0
3. Has the smoother traffic due to the project supported the transport of goods from farther places? (%)	Yes: 99 No: 0 Don't know: 1	Yes: 56 No: 3 Don't know: 41	Yes: 96 No: 4 Don't know: 0	Yes: 100 No: 0 Don't know: 0
4. Has the impact of rain on traffic lessened?[*1]	88% of the respondents said that before the project, a heavy rain or flood had made the road impassable for at least 30% of the year. 86% of the respondents said that the road was now impassable for 10% of the year or less.	49% of the respondents said that before the project, a heavy rain or flood had made the road impassable for at least 30% of the year. All the respondents said that the road was now impassable for 10% of the year or less.	90% of the respondents said that before the project, a heavy rain or flood had made the road impassable for at least 30% of the year. 78% of the respondents said that the road was now impassable for 10% of the year or less.	80% of the respondents said that before the project, a heavy rain or flood had made the road impassable for at least 30% of the year. 56% of the respondents said that the road was now impassable for 10% of the year or less.
5. Percentage of respondents who reported improved access by type of destination[*2]				
• Markets/shops	98	98	98	73
• Schools (for children)	91	31	88	3
• Hospitals	80	66	73	1
• Government offices	50	59	56	0
• NGO offices	29	20	30	0
• Other	0	0	1	3
6. Overall evaluation of the benefits of the road project (%)				
Excellent	30	35	14	80
Good	61	65	86	19
Neutral	8	0	0	1
Slightly Negative	1	0	0	0
Very Negative	0	0	0	0

[18] To estimate the number of beneficiaries in the Project Completion Report, the executing agency used the formula: distance of the road section (in kilometers) x 5 (in square kilometers, which represents the area of land benefited per kilometer of the road section) x 876 (population density per square kilometer). Using this formula, the number of beneficiaries are calculated at 87,600 in Sylhet, 49,932 in Noakhali, 61,889 in Chittagong, and 52,341 in Cox's Bazar.

Note: *1. In response to the question of what percentage of the number of days per year when rain makes the road impassable, respondents were asked to select the answer from six options: "over 50%," "over 40% up to 50%," "over 30% up to 40%," "over 20% up to 30%," "over 10% up to 20%," and "10% or less."
*2. The total percentage exceeds 100% in most districts, because multiple answers were allowed.

Residents in all four districts felt that the project meant more active physical distribution. They also felt that the project had sharply reduced the adverse effects of rains and floods on road traffic and improved access to various types of facilities on the whole. Their overall evaluation of the road project was high.

Officials at the executing agency (LGED headquarters) told the External Evaluator that the construction of submersible roads, which was one of the project outcomes, made vehicle traffic possible for about 50% of the year because they were designed to withstand the effect of inundation. (When the roads are submerged, vehicle traffic is replaced by boat traffic.) The officials said that the original roads were impassable throughout the year because they were damaged by effect of inundation. These submersible roads also proved useful in carrying harvested agricultural products to safer places beforehand to protect them from inundation.

(2) Improvement of GCs

In areas where the beneficiary survey was conducted (beneficiary survey areas), the External Evaluator interviewed shopkeepers and market operators and participants, in addition to the questionnaire survey of beneficiaries (market users). The results of the interviews are given below. (The External Evaluator visited three areas; he was unable to visit Chittagong because of the political instability in Bangladesh during the period of the evaluation study. In the vicinity of the study areas in Noakhali, there were no GCs that had been improved under this project.) The improvement of GC facilities has generally galvanized economic activity at these markets[19].

Table 4: Results of Interviews on GCs

District	Results
Sylhet	Owners of shops at a GC that had been improved under the project showed high levels of satisfaction. They cited such reasons as less susceptibility to rain and increased ease with which they can walk within the market even on a rainy day. The number of shops was now much larger than before. Five female shopkeepers who run their shops in the section of the market that was reserved for female shopkeepers only told the External Evaluator that opening their shops within the market had allowed them to increase their sales significantly.
Cox's Bazar	The External Evaluator interviewed the secretaries of the market management committees at two GCs that had been improved under the project. Both of them said that both the number of market participants and their sales had grown substantially from the pre-project levels (doubled in the past six years). A female shopkeeper who sold cereals at her permanent shop in one of the two GCs told the External Evaluator that the two-day training session she had received under the project[*1] proved useful in her business. (Her sales quadrupled from the pre-project level in the past six years.)

Note: *1. This training session was part of a training program the consultant for this project offered to officials at

[19] Because of the concrete structures, the weather now had less of an impact on the trade of goods. The fact that the roads in the vicinity of these GCs had been improved under the project also proved useful in improving access to these markets.

LGED and local government offices, as well as civil work contractors and poor women for effective project implementation. The program was made up of four components: (i) capacity building training for LGED officials for smooth implementation of the project; (ii) work-quality assurance training for civil work contractors on the project; (iii) management training for officials at local government offices; and (iv) training designed for poor women to learn skills such as planting trees and starting up a business.

The results of the questionnaire survey of beneficiaries are given below[20]. They highlight the great benefit that market users have gained from the development and improvement of GCs.

Table 5: Results of the Questionnaire Survey on GCs

District	Results
Sylhet	Of all the 80 respondents, 59 said they had already used the GC. They were asked how much the newly improved GC benefited them. Among the three options for the answer, 51% opted for "greatly" and 49% for "to some extent" (and 0% for "not so much"). Asked to identify specific benefits,[*1] 98% reported "greater convenience in buying goods, especially a wider range of items" while 19% cited "a cleaner and more comfortable restroom."
Chittagong	Of all the 80 respondents, 56 said they had already used the GC. They were asked how much the newly improved GC benefited them. Among the three options for the answer, 50% opted for "greatly" and the other 50% for "to some extent" (and 0% for "not so much"). Asked to identify specific benefits, 82% reported "greater convenience in buying goods, especially a wider range of items," and 20% cited "a cleaner and more comfortable restroom."
Cox's Bazar	All 80 respondents said they had already used the GC. They were asked how much the newly improved GC benefited them. Among the three options for the answer, 100% opted for "greatly" (0% for "to some extent" and "not so much"). Asked to identify specific benefits, 96% reported "greater convenience in buying goods, especially a wider range of items", and 3% cited "a cleaner and more comfortable restroom."

Note: *1. They were given three options for the answer: "greater convenience in buying goods, especially a wider range of items," "a cleaner and more comfortable restroom," and "Other" (open-ended description).

(3) Construction of UPCs and the Extension of LGED Functional Building

In the beneficiary survey areas, the External Evaluator interviewed officials at UPCs, in addition to the questionnaire survey of beneficiaries (UPC users). The results of the interviews are given below.[21] Before the project, public services for residents were delivered from different locations, or there were no such public facilities as UPCs in some areas. Now the newly constructed facilities provide one-stop services. They are also used effectively.

[20] In the vicinity of the study areas in Noakhali, there were no GCs that had been improved under this project.
[21] The External Evaluator was unable to visit Chittagong because of the political instability in Bangladesh during his stay in the country for the evaluation study.

Table 6: Results of Interviews on UPCs

District	Results
Sylhet	Interviews with the chairpersons and other high-ranking officials at UPCs suggested that they were greatly satisfied with the UPCs. It was confirmed that employees were working in most of the rooms, and the facilities as a whole were highly utilized.
Noakhali	Interviews with the chairpersons and other high-ranking officials at UPCs suggested that the newly constructed buildings allowed them to consolidate their public services that had been delivered from different locations. Again, it was confirmed that employees were working in most of the rooms, and the facilities as a whole were highly utilized. Financed by tax revenues of the Unions, the new buildings were maintained without major problems.
Cox's Bazar	The chairperson of a Union Parishad told the External Evaluator that, because of the lack of such facilities as a UPC, the Parishad used to rent space in a store to execute administrative work before the project. He said that the new building now made it possible to deliver a wider range of services for residents and computerize the administrative work. The building, which was two-storied with ten or so rooms, functioned generally well although some surface paint was coming off.

The results of the questionnaire survey of beneficiaries are given below[22]. They suggest that the residents, who receive public services, also benefit greatly from the construction of UPCs.

Table 7: Results of the Questionnaire Survey on UPCs

District	Results
Sylhet	Of all the 80 respondents, 63 said they had already used the UPC. They were asked how much the newly constructed UPC benefited them. Among the three options for the answer, 58% opted for "greatly" and 42% for "to some extent" (and 0% for "not so much"). Asked to identify specific benefits[*1], 68% reported "one-stop public services," and 70% cited "easy access to public services due to the geographical proximity from their homes."
Cox's Bazar	All 80 respondents said they had already used the UPC. They were asked how much the newly constructed UPC benefited them. Among the three options for the answer, 100% opted for "greatly" (0% for "to some extent" and "not so much"). Asked to identify specific benefits, 90% reported "one-stop public services," and 10% cited "easy access to public services due to the geographical proximity from their homes."

Note: *1. They were given three options for the answer: "easy access to public services due to the geographical proximity from their homes," "we can receive one-stop public services," and "Other (open-ended description)."

(4) Improvement of Boat Landing Stages/Ghats

The External Evaluator asked several users at one of the improved boat landing stages/ghats (in the beneficiary survey area) in Sylhet Division to identify some of the positive effects of the facility improvement. They said that while they could not use the old facility in bad weather because of unstable footing, they now can use the new facility throughout the year because it is not dangerous even in wet weather. They also said that the number of boats that used the facility had doubled and that both the number of passengers and the amount of freight transported also

[22] There were no UPCs that had been constructed under this project in the vicinity of the beneficiary survey areas in Noakhali or Chittagong.

increased proportionally.

3.3 Impact

3.3.1 Intended Impacts

The intended overall impact is "reduced economic and social disparities between urban and rural areas in Bangladesh." The following paragraphs focus on two specific indicators for the project sites: (1) more employment opportunities and increased income for local residents; and (2) improved status of rural women.

(1) More employment opportunities and increased income for local residents

The executing agency states that improved links between the main road networks and rural areas as a result of the project have generated employment opportunities both in agricultural activities not related to cereals (fisheries, cattle and poultry farming), as well as in the distribution and transport industries[23].

Among the results of the questionnaire survey of beneficiaries in four locations, results on employment opportunities and income are given below. They suggest that the project had certain levels of positive effects on employment opportunities and income, given that the survey covered local residents living along some of the roads that had been upgraded under the project.

[23] Senior officials at the market management committee and the transportation association in a beneficiary survey area in Sylhet commented that the number of auto rickshaws, which had previously rarely been seen, was now almost 300. In Noakhali, the External Evaluator interviewed people at three locations along the road covered by this project where shops are concentrated, including the starting point of the road covered by this project. These people included the chairpersons of the local Union Parishads who were responsible for the management of local markets, as well as transport business operators and shop owners. They reported a significant increase in the number of shops in these markets from pre-project levels. (Note that these markets had existed before the project; they were not among those that had been constructed or upgraded under the project.)

Table 8: Results of the Questionnaire Survey on Employment Opportunities and Income

District	Results		
	Employment opportunities: Did you have a new opportunity for employment or business after the project?	Changes in income: Did your household income increase after the project?	Reasons for increased income*
Sylhet	Yes (59%), No (41%)	Yes (96%), No (4%) Note: 63% of the respondents who said "yes" reported a 30% or more increase in income.	New employment opportunity (73%), lower travel cost (57%), shorter travel time (56%), smaller amounts of agricultural products discarded (51%), higher prices of agricultural products (30%)
Noakhali	Yes (85%), No (15%)	Yes (100%), No (0%) Note: 92% of the respondents who said "yes" reported a 30% or more increase in income.	Shorter travel time (55%), new employment opportunity (44%), lower travel cost (8%)
Chittagong	Yes (70%), No (24%)	Yes (95%), No (5%) Note: 74% of the respondents who said "yes" reported a 30% or more increase in income.	Shorter travel time (53%), new employment opportunity (45%), smaller amounts of agricultural products discarded (29%), lower travel cost (20%), higher prices of agricultural products (15%)
Cox's Bazar	Yes (100%), No (0%)	Yes (100%), No (0%) Note: 73% of the respondents who said "yes" reported a 30% or more increase in income.	Shorter travel time (64%), new employment opportunity (13%), smaller amounts of agricultural products discarded (10%), lower travel cost (10%)

Note: * Multiple answers were allowed.

Statistical information on the income of residents not living along the roads covered by the project was not available. According to the Final Report on Effect Monitoring and Evaluation (2009), however, a significant increase in annual agricultural production after the project was reported by 42.5% of the respondents to a questionnaire survey that had been conducted on 311 households in the project area (p. 87). These households had been selected by random sampling. According to the 2009 report, the average yield per unit of area increased by 7.0% from 2007 to 2009, and the area under cultivation rose by 31.4% during the same period on average for all kinds of agricultural products. Such trends were observed for specific items. For example, the Bangladesh office of International Development Enterprise, an international NGO that

specializes in the realm of agriculture, reported increases in the yield and sales price of cucumber from pre-project levels in project sites. Before/after comparisons show that from 2009 to 2011, the yield increased by 30.7% and the sales prices by 11.4%, pushing up sales by 45.6%.

It should be noted that such an increase in agricultural production is not necessarily the result of this project alone. Besides more efficient physical distribution due to improved traffic accessibility[24], the contributing factors may include the wider use of high-yielding varieties and better finance for farmers.

Next, the External Evaluator conducted statistical analysis of macro data (at both national and division levels) in light of the ultimate goal: "reduced economic and social disparities between urban and rural areas in Bangladesh." The Bangladeshi government's 6th Five Year Plan, in Chapter 7 (p. 171), Part 1: Strategic Directions and Policy Framework, provides data on how the incidence of poverty changed from 2005, when the project was launched, to 2010, when the project was almost completed, in the two divisions where the project was implemented. Such data is given below:

Table 9: Changes in the Incidence of Poverty* by Division

	2005			2010		
	National	Rural	Urban	National	Rural	Urban
National	40.0	43.8	28.4	31.5	35.2	21.3
Chittagong Division	34.0	36.0	27.8	26.2	31.0	11.8
Sylhet Division	33.8	36.1	18.6	28.1	30.5	15.0

Source: HIES Reports, Bangladesh Bureau of Statistics
Note: * Head count rate, upper poverty line.

A look at poverty in urban and rural areas in the two divisions where project sites were located shows that as far as Chittagong Division is concerned, the extent of amelioration of poverty is higher in urban areas than in rural ones. By contrast, such extent is higher in rural areas in Sylhet Division. In both divisions, however, the incidence of poverty in rural areas is on the decline.

The impact analysis above points to two major effects of the project. First, the findings of the two surveys that were conducted based on valid numbers of samples[25] suggest that the paving of roads in project sites improved traffic accessibility, which in turn helped to increase

[24] Improved traffic accessibility has increased the availability of seeds of high-yielding varieties as well as fertilizers and pesticides for farmers, which in turn has helped boost production. According to the Effect Monitoring and Evaluation Survey Report (p.87), statistical data (questionnaire replies) shows that the improved beneficiary farmers' access to improved seeds and agricultural input after the project, by comparing the data between before and after the project. The causal relationship between the improvement of access and the increase of production, however, was not identified in the same report. But the improved access seems to be one of the factors contributing to the increase of production.

[25] The questionnaire survey of beneficiaries as part of this ex-post evaluation, and the Effect Monitoring and Evaluation Survey as part of this ODA loan project.

agricultural production and income for residents. Second, the fact that the direct beneficiaries of the project accounted for 12% of the combined population of the Chittagong and Sylhet divisions[26] implies that the project played a part in improving the incidence of poverty in rural areas in the two divisions as shown in Table 9 above.[27]

(2) Improved Status of Rural Women

In this project, a total of 1,945 poor women participated in the management of Upazila roads and Union roads over a period of two years, planting trees on road shoulders (slopes) and engaging in road maintenance work (repairing minor damage).[28] These women were chosen in a democratic manner as part of the information campaign at each project site. The Effect Monitoring and Evaluation Survey team of this project identified five tangible effects: (i) increase in women's assets and savings; (ii) increased investment in production activities made possible by higher income; (iii) the securing of food; (iv) a better living environment; and (v) increased self-esteem of women. The executing agency told the External Evaluator that these women's horticulture and sewing skills acquired as a result of training programs by NGOs have been retained, as confirmed by, for example, focus group discussions after project completion.

The executing agency said that in February 2014, the Implementation Monitoring and Evaluation Division (IMED) of the Ministry of Planning interviewed about 30 women who, for a total of five years, had engaged in the maintenance of a road in Cox's Bazar District that had been upgraded under the project. IMED found that many of these women had saved about 80,000 taka[29] from the remuneration for the five-year work and intended to start up a business or run a small livestock farm.

3.3.2 Other Impacts

(1) Impacts on the natural environment

The initial environmental impact assessment report on this project was approved in January 2005 by the Department of Environment of the Bangladeshi government.

It was predicted that civil works under the project would cause soil erosion that entailed surface water pollution. The executing agency was expected to supervise the contractors so that they would take appropriate preventive measures. In fact, the following measures were taken to mitigate such problems as air pollution, water pollution, and noise.

• Air pollution: The contractors removed the equipment emitting fumes that exceeded permissible levels and dispersed water to minimize the stirred up dust.

[26] The figure is calculated by dividing the total number of beneficiaries (4.56 million) by the combined population of the two divisions based on the 2011 census (38.33 million).
[27] Although the project is thought to have helped to alleviate poverty in rural areas in Chittagong, it is difficult to conclude that the project played a part in reducing disparities between urban and rural areas in the division, because the poverty rate in urban areas decreased significantly.
[28] According to the executing agency, a larger number of poor women are employed to maintain the roads that have been upgraded under the project even after the completion of the project.
[29] Approximately 11,000 yen at the exchange rate of June 2014.

• Water pollution: The contractors planted trees and short grass to prevent landslides, avoiding any resultant water pollution.

• Noise: The contractors refrained from work at night.

These measures were taken based on monthly monitoring of key quality indicators for air and water by the executing agency. The monitoring was based on site visits and visual inspections only; it did not involve accurate measurements using measuring instruments.

Table 10 below shows the results of interviews on the environmental aspect as part of the beneficiary survey. In Cox's Bazar, many respondents answered "worsened slightly" or "worsened considerably." This likely reflected increased automobile emissions and noise as the roads covered by the survey were located in densely populated commercial districts and therefore had much traffic.[30] This fact most likely explains the complaints in other districts that the environmental quality worsened.

Table 10: Environmental Changes after Construction/Improvement Work (% of respondents)

District	Category	Worsened considerably	Worsened slightly	Unchanged	Improved slightly	Improved considerably
Sylhet	Air	0	4	54	40	3
	Noise	0	46	36	18	0
	Water	0	4	81	15	0
Noakhali	Air	1	52	22	23	3
	Noise	18	55	6	21	0
	Water	0	5	86	6	3
Chittagong	Air	0	11	67	16	7
	Noise	1	22	60	13	4
	Water	0	4	80	11	5
Cox's Bazar	Air	14	49	3	35	0
	Noise	46	31	1	22	0
	Water	35	53	0	12	1

(2) Land Acquisition and Resettlement

This project did not involve the resettlement of residents. Associated land acquisitions are summarized below. According to the executing agency, land acquisitions were made without causing major problems with local residents.

• Total area acquired: 4.27 hectares

• Number of sites acquired: 7 (private land only)

• Total acquisition cost: 24 million taka

• Compensation for residents: Provided in accordance with the Land Acquisition Act.

(3) Unintended Positive/Negative Impacts

The questionnaire survey also shed light on residents' views on how the project had affected

[30] Interviews with people who had conducted the beneficiary survey on the ground revealed that civil works associated with the project blocked the water in a canal in a questionnaire survey site, affecting its water quality. It was later found out, however, that this problem was solved after the work was completed.

the incidence of traffic accidents. It is understood that the number of traffic accidents rose in Sylhet, Noakhali and Chittagong because of increased vehicle traffic resulting from road paving. In Cox's Bazar, by contrast, the upgrading of roads seems to have reduced the number. Improved roads likely resulted in fewer rollover accidents that were attributable to poor road conditions; these roads, largely located in densely populated commercial districts, already had certain levels of traffic before the project.

Table 11: Changes in the Number of Traffic Accidents after the Project (% of respondents)

District	Sylhet	Noakhali	Chittagong	Cox's Bazar
Results	Increased: 88 Decreased: 13 Unchanged: 0	Increased: 95 Decreased: 1 Unchanged: 4	Increased: 68 Decreased: 24 Unchanged: 9	Increased: 0 Decreased: 100 Unchanged: 0

As described above, this project has largely achieved its objectives. Therefore its effectiveness and impact are high.

3.4 Efficiency (Rating: ②)

3.4.1 Project Outputs

The table below shows planned and actual outputs of this project.

Table 12: Project Scope

Items	Planned	Actual (At completion: 2011)	Analysis of gaps
1. Civil Works			
1) Upgrading Upazila roads (UZRs) a. Pavement b. Bridges and Culverts c. Tree Plantation and Care Taking	 1,069 km 5,123 m 1,069 km	 934 km 6,830 m 885 km	A detailed field study by the consultant made it necessary to make these adjustments that better reflected the local topography.
2) Upgrading of Union roads (UNRs) a. Pavement b. Bridges and Culverts c. Tree Plantation and Care Taking	 120 km 1,400 m 120 km	 108 km 473 m 108 km	A detailed field study by the consultant made it necessary to make these adjustments that better reflected the local topography.
3) Construction of Submersible Roads	45 km	45 km	—
4) Improvement of GCs	67 locations	67 locations	—
5) Upgrading of Boat Landing Stage/Ghats	20 locations	18 locations	This gap resulted from the difficulty in securing appropriate sites.
6) Construction of UPCs	73 locations	67 locations	This gap resulted from the difficulty in securing appropriate sites.
7) Extension of LGED Functional Building	2,500 m^2	2,500 m^2	—
2. Procurement of equipment and vehicles	362	402	Minor adjustments were made to better meet local needs.
3. Training			
1) Contracting NGOs (M/M)	360	360	—
2) Training for LGED officials, etc.	39,826 man-days	35,830 man-days	This gap resulted from cancellations by some planned participants.
4. Consulting services (M/M)	651	785	Due to the extension of the project duration.

For civil works, the actual output was largely as planned in scale as a whole. The total length of roads upgraded was slightly shorter than planned, as were the numbers of boat landing stages/ghats upgraded and UPCs constructed. The amount of consulting services was 20% higher than planned in terms of man/months (M/M).

The shorter total length of roads upgraded was the result of adjustments that had been made to better accommodate the local topography at the time of the detailed design. The smaller numbers of boat landing stages/ghats upgraded and UPCs constructed were the result of the failure to secure sites appropriate for building these facilities. The larger amount of consulting services was the reflection of the extended duration of the project.

The gap in the scope of civil works was so small that its impact on the project purpose was likely limited.

The planned scope of consulting services included preparations for project implementation (bidding assistance, support for road maintenance planning), detailed design review, construction management, training primarily for officials at the executing agency, and guidance on project effect monitoring for officials at the executing agency. These services were delivered as planned. The executing agency said that they were largely satisfied with the civil works, the procurement of equipment and vehicles, and the consulting services.

A major characteristic of this project was that small project sites were widely distributed. To address this drawback, the project standardized, designed and strengthened the management framework. Specifically, the project adopted standardized specifications in building roads, culverts and markets. The project area was made up of nine project districts, and each came under the responsibility of the district executive engineer. Consultants, who were field engineers, also engaged in the monitoring and quality control of the project activities in those nine project districts. Furthermore, at the Upazila level, officials at the executing agency were assigned as personnel in charge of monitoring, and visited project sites often. The Project Implementation Office at LGED supervised and monitored the project as a whole, together with consultants.[31] It is therefore safe to conclude that reasonable measures were taken to address the wide distribution of small sites.

This ODA loan project was associated with the technical cooperation project entitled "Strengthening of Activities in Rural Development Engineering Centre (RDEC) Project." Standard designs, specifications, and manuals used in the ODA loan project were compiled into a database and the technical cooperation project took advantage of this database system.

This project provided capacity building training for the executing agency as well as training designed for poor women who would engage in tree planting work as part of the project. A total of 17,416 people participated in these training programs, including LGED officials, civil work contractors, officials at local government offices[32], women wishing to start up a business, and Labour Contracting Society (LCS)[33]. This number translates into 35,830 man-days. The executing agency was largely satisfied with the content of these training programs.

The report on gender issues that was compiled by the Effect Monitoring and Evaluation Survey team, entitled "Effects Monitoring and Evaluation Study on Gender Issues," states on page 28 that while female shopkeepers increased in number after the project, interviews with such women that were conducted for this ex-post evaluation showed that what they had learned on business administration from the training programs proved useful for them (see also "3.2.2 Qualitative Effects" for reference).

3.4.2 Project Inputs

3.4.2.1 Project Cost

[31] The Project Implementation Office disbanded at project completion. The developed/improved roads and other facilities were hitherto maintained by the entities that will be described in 3.5.1 later.
[32] LGIs (Local Government Institutes).
[33] LCS has been organized by an NGO to provide local poor women with training in necessary skills.

The planned and actual costs of the project are shown in Table 13 below.

Table 13: Planned and Actual Costs of the Project

Unit: million yen

Item	Planned at the time of appraisal		Actual (At completion: 2011)	
	Total	Covered by loans	Total	Covered by loans
Civil work cost	11,937	10,103	14,043	10,516
Price escalation	3	3	0	0
Equipment and vehicles	305	305	297	297
Training	93	93	70	70
Consultants	307	307	307	307
Measurements, hiring NGOs, etc.	15	15	4	4
Maintenance costs, taxes, etc.	2,004	0	438	0
Physical contingency	703	519	0	0
Total	15,367	11,345	15,158	11,193

Note: 1. "Planned at the time of appraisal"
• Exchange rate: 1 taka = 1.85 yen
• Price escalation rate: Foreign currency: 1.4% p.a.; domestic currency: 0.0% p.a.
• Physical contingency rate: 5%
• Cost calculation base period: October 2004
2. "Actual" (Source: JICA internal materials)
• Exchange rate: 1 taka = 1.125 yen
3. Because of rounding to the nearest number, individual figures do not necessarily agree with the total.

The actual project cost was lower than plan; the former, totaling 15,158 million yen, represented 98.7% of the latter, which totaled 15,367 million yen. The main reason behind this is that while the actual cost was 1.62 times the planned cost in the local currency because of rising prices of equipment and vehicles[34], the value of the yen against the local currency was actually 1.64 times the value at the time of appraisal.

3.4.2.2 Project Period

The planned project period was 49 months, from the planned date of loan agreement (L/A) in March 2005 to the planned completion date[35] in March 2009. The actual project period was 76 months, from March 2005 to June 2011. The actual project period was significantly longer than planned, representing 155.1% of the planned period.

The following four factors contributed to the extended project period:

• A delay in selecting the consultant in charge of design and civil work supervision[36]: Responsible for a delay of several months (in the start of civil works).

• A major flood and political instability in 2007[37] and a rise in the price of materials:

[34] From the time of appraisal to the time of project implementation, the prices of major construction materials rose significantly by 110% for bricks, 70% for cement, and 50% for steel and sand, according to a survey by the executing agency.
[35] The completion date is defined as the day when the payment for all operations is completed.
[36] The government procedure to approve the selected contractor took more time than expected.
[37] This flood caused civil works to be suspended for six months in Sylhet. Political instability was also responsible

Responsible for a delay of several months in work completion.

• Some 100 cases of contract cancellation due to poor performance of civil work contractors[38]: Responsible for a delay of six to nine months in work completion.

• A delay in construction works due to adjustments of the project scope in response to changes in the exchange rate: The gradual depreciation of the yen during the early stages of the project prompted the executing agency to consider narrowing the project scope. Later, however, the yen rebounded and in 2009 began to see its value increase sharply against other currencies. After consulting with JICA, the executing agency decided to go ahead with the original project scope and the suspended works were restarted. Therefore, the completion of the project was delayed. Some of the restarted works were not completed until 2011. That was the decisive factor for the eventual delay in project completion.

While the first and third factors above were due to human error, the other factors were rather external in nature.

3.4.3 Internal Rate of Return

At the time of appraisal, the economic internal rate of return (EIRR) was calculated for 15 of the road sections covered by the project. Comparisons between planned and actual EIRR are shown below:

Time of calculation	At appraisal (2005)	At completion (2011)	At ex-post evaluation (2013)
1. Calculation method (calculated in local currency)	Costs: project cost, operation and maintenance costs Benefit: travel cost savings Project life: 20 years		
2. EIRR	30.9%*	45.7%	57.1%

Note: * As one of the criteria for selecting road sections to be covered by the project, the executing agency set the minimum EIRR (economic internal rate of return) at 12%.

EIRR increased over time and exceeded the target at the time of appraisal. Here is the background. Although the project cost (civil work cost) was higher than planned, traffic volume was significantly larger than planned. In addition, the amount of travel cost saved per unit increased over time from the time of appraisal. These two factors likely pushed up EIRR even further.

Although the project cost was within the plan, the project period exceeded the plan. Therefore the efficiency of the project is fair.

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for a delay of another six months in completion of the work.

[38] At the time (2007–2008), the political situation was so unstable that the military had no choice but to intervene in politics. Some of the 500 civil work contractors on the project, intentionally delayed their work in view of such political instability, while some others fell behind schedule because of their failure to procure materials due to price rises. These circumstances prompted the executing agency to cancel the contract with about 100 contractors that failed to observe the deadline as stipulated in the contract, citing the nonfulfillment of the contract as the reason. It may be worth adding that all these contractors had been selected by competitive bidding in accordance with government rules for procurement.

3.5 Sustainability (Rating: ②)

3.5.1 Institutional Aspects of Operation and Maintenance

(1) Roads

According to LGED, the executing agency, the operation and maintenance of roads in Bangladesh comes under the jurisdiction of the following units of LGED.

• RIMMU (Rural Infrastructure Maintenance Management Unit, headquarters): Responsible for formulating policies, plans, and budgets as well as supervising overall maintenance.

• Regional Superintending Engineer's Office (regional level): Responsible for supervising regional maintenance activities and providing technical support for executive engineers.

• Office of the Executive Engineer (District level): Responsible for prioritizing activities, developing annual maintenance plans, approving day-to-day maintenance plans, implementing overall plans and supervising their implementation, ensuring quality control, and reporting.

• Upazila Engineer's Office (Upazila level): Responsible for assessing maintenance needs, preparing bidding documents (in the case of contracting out maintenance operations), and practicing maintenance activities.

The division of roles (at the Upazila level) in maintaining the roads upgraded by the project is shown below. According to the maintenance guidelines that define the division of duties, day-to-day road maintenance is the direct responsibility of Upazila offices of LGED. The repairing of roads is implemented by private citizens hired by these Upazila offices, which provide training for them. Construction and maintenance of road shoulders and side slopes are implemented by LCS under contract to LGED[39]. The executing agency states that regular maintenance of Upazila roads and Union roads is contracted out to civil work contractors, whose work is without major problems in term of quality.

[39] Poor women as described in "3.3.1 Intended Impacts" are hired based on such a contract.

Table 14: The division of roles in maintaining the roads upgraded by the project

Facilities	Maintenance method	Staff in charge	Details of maintenance method
Upazila roads	Routine maintenance	(Roads) Sub-Assistant Engineer (Shoulders) Community Organizer	Roads: To repair relatively small damages according to necessity Shoulders: To protect shoulders and slopes and to conduct roadside tree plantations on a daily basis
	Periodic maintenance (Resealing, overlaying and rehabilitation)	Assistant Upazila Engineer, Sub-Assistant Engineer	Resealing: To conduct at an intervals of 3 to 5 years in order to arrest further deterioration of roads Overlaying: To conduct at an intervals of 8 to 10 years in order to bring back the road condition to its original smoothness Rehabilitation: To add strength to the pavement by providing additional thickness to the layer after expiry of design life
Union roads	Routine maintenance	(Roads) Sub-Assistant Engineer (Shoulders) Community Organizer	Roads: To repair relatively small damages according to necessity Shoulders: To protect shoulders and slopes and to conduct roadside tree plantations on a daily basis
	Periodic maintenance (Resealing, overlaying and rehabilitation)	Assistant Upazila Engineer, Sub-Assistant Engineer	Resealing: To conduct at an intervals of 3 to 5 years in order to arrest further deterioration of roads Overlaying: To conduct at an intervals of 8 to 10 years in order to bring back the road condition to its original smoothness Rehabilitation: To add strength to the pavement by providing additional thickness to the layer after expiry of design life

Source: Answers to the questionnaire for the executing agency

According to the executing agency, namely LGED, sufficient numbers of LGED officials engage in maintenance work. With a low turnover rate, a sufficient number of personnel are retained. LGED provides a range of training programs that it says help its officials to maintain their motivation.

(2) GCs, UPCs, and Boat Landing Stages/Ghats

After the project was completed, GCs, UPCs, and boat landing stages/ghats came under the responsibility of local government offices such as Zila Parishads, Upazila Parishads, and Union Parishads. UPCs are operated and maintained by Union Parishads. As far as GCs and boat landing stages/ghats are concerned, day-to-day maintenance work is carried out by private companies that are hired on a lease contract basis with local government offices. Regular maintenance work comes under the responsibility of the local government offices that own them.

In summary, there is a solid framework in place for operating and maintaining rural roads. The accountability for different aspects of road maintenance is clearly defined and so are the duties of individual officials, in relation to roads. With a low turnover rate, the units in charge are sufficiently staffed. A clearly-defined operation and maintenance framework is also in place for UPCs and boat landing stages/ghats. Generally speaking, it is safe to conclude that there are no major institutional problems with the operation and maintenance of the entire project.

3.5.2 Technical Aspects of Operation and Maintenance

(1) Roads

The below shows the major qualifications for different types of LGED officials who are engaged in road maintenance at the Upazila level. They are assigned to different posts according to their qualifications or expertise and their experience in road operation and maintenance.

Table 15: Qualifications for LGED Officials by Type

Type of jobs	Required academic degree	Standard years of work experience required
Community organizer	Graduate of middle school	5
Sub-assistant engineer	Diploma in engineering	5
Assistant engineer	Diploma or bachelor's degree in engineering	5

Source: Answers to the questionnaire for the executing agency

Two maintenance manuals are commonly used: "Guidelines for Rural Roads & Culverts Maintenance Programme" and "Handbook on Cold & Soft Mix Asphalt." LGED provides in-house training and OJT annually to its officials in charge of road operation and maintenance.

The executing agency finds no major problems in the technical capacity of its officials in the practical aspect of road operation and maintenance. It is therefore safe to conclude that there are no major technical problems.

(2) GCs, UPCs, and Boat Landing Stages/Ghats

These facilities are so simple in structure that they do not require special skills for their day-to-day maintenance. Major repair works are contracted out as appropriate.

3.5.3 Financial Aspects of Operation and Maintenance

(1) Roads

The LGED budget is largely divided into a development budget and an ordinary budget. The maintenance of rural roads is financed by the LGED's ordinary budget. This road maintenance budget is allocated by the LGED headquarters among its district offices that are in charge of the roads. Budgets plans for both Upazila roads and Union roads are prepared by the district executive engineer. After being approved by the chief engineer, these plans are submitted to the LGED headquarters, which makes budget allocations accordingly[40].

A comparison between the required and actual budget allocations for road operation and maintenance of district roads covered by the project as well as other roads, indicates that the actual total for the nine districts over the past four years represents only 16% of the required total, as shown below. This clearly shows insufficient allocations for road maintenance[41].

Table 16: Required and Actual Budget Allocations for Road Maintenance in the Nine Districts Where the Project Was Implemented

Unit: million taka

Fiscal year	Maintenance costs	
	Required level	Actual
2009-10	1,416.7	518.0
2010-11	2,360.7	605.2
2011-12	4,373.9	590.5
2012-13	7,278.0	778.3

Source: The executing agency

In January 2013, however, the Bangladeshi government announced a new maintenance policy that gives priority to roads (including the ones that were improved by the project) that have been constructed or upgraded with donor aid. Financial aspect is expected to improve and accordingly, the maintenance of roads upgraded by the project is also expected to improve.

(2) GCs, UPCs, and Boat Landing Stages/Ghats

The operation and maintenance of GCs are financed by lease income from the private companies that manage these markets[42]. Interviews with the chairpersons of Union Parishads in Sylhet and Noakhali suggest that the maintenance of GCs is financed more or less adequately by a range of taxes for Union Parishads. The maintenance of boat landing stages/ghats is financed by lease charges for these facilities.

[40] Actual budget allocations do not necessarily match the submitted plans.

[41] The gap between the required and actual allocations was especially large in the most recent two years. The executing agency told the External Evaluator that this large gap was mostly attributable to the fact that requirements had been significantly increased as a result of major flooding in 2012. According to the agency, the budget is disbursed every quarter, with the first quarterly allocations carried out at the early stage of every fiscal year.

[42] The answer to the questionnaire for the executing agency and interviews with the chairpersons of Union Parishads suggest that 15–25% of such lease income may be used to finance day-to-day and regular maintenance work based on a government notice.

3.5.4 Current Status of Operation and Maintenance

(1) Roads

The executing agency's overall evaluation of its performance was "fair" out of the four options[43]. The results of the questionnaire survey of beneficiaries (80 people per site) on the maintenance status of roads are as below. The beneficiaries did not think that roads are perfectly maintained but nevertheless evaluated the status more highly than the executing agency. On-site examinations of some road sections at the time of the ex-post evaluation found no serious problems in view of the fact that more than three years had passed since the project completion.

Table 17: Maintenance Status of Roads

Site \ Maintenance status	Very good	Good	Not very good	No good	N/A
Sylhet	20	42	18	0	0
Noakhali	2	29	15	34	0
Chittagong	1	49	28	1	1
Cox's Bazar	68	12	0	0	0

(2) GCs, UPCs, and Boat Landing Stages/Ghats

No information on GCs was available from the executing agency. Yet the External Evaluator's on-site inspection observed rows of concrete facilities and shops that withstood wet weather in Sylhet and Cox's Bazar.

The table below shows the results of the questionnaire survey of beneficiaries on the maintenance of these markets. The beneficiaries generally gave a high mark.

Table 18: Maintenance Status of GCs

Site \ Maintenance status	Very good	Good	Not very good	Not good
Sylhet	18	34	6	0
Noakhali	Omitted because of insufficient number of samples			
Chittagong	1	41	10	0
Cox's Bazar	69	11	0	0

The External Evaluator found no problems with the appearance and other aspects of two UPCs he visited in Sylhet and Noakhali. He observed that they were in good repair and put to good use in delivering various services. In Cox's Bazar, the External Evaluator observed that some paintings had fallen off from the exterior of a UPC but found no major problems with its functionality.

The table below shows the results of the questionnaire survey of beneficiaries on the maintenance of UPCs. The results are mostly positive.

[43] The four options are "very good" (no problems), "good" (no major problems), "fair" (minor problems only), and "bad" (serious problems).

Table 19: Maintenance Status of UPCs

Maintenance status / Site	Very good	Good	Not very good	No good
Sylhet	22	41	0	0
Noakhali	Survey not conducted			
Chittagong	Omitted because of extremely insufficient number of samples			
Cox's Bazar	69	11	0	0

The External Evaluator visited boat landing stages/ghats in Sylhet and found that they are made of concrete and have a terraced structure. Local residents said that the old facilities before the project were only usable for 50% of the year because the slippery ground in wet weather posed a serious danger. They said that the upgraded facilities withstand bad weather and are usable throughout the year.

Some problems have been observed in terms of financial aspect and current status[44] of Operation and Maintenance. Therefore sustainability of the project effect is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The implementation of this project was in line with the development plan of the People's Republic of Bangladesh, the development needs of the project area, and Japan's ODA policy. Therefore its relevance is high. Regarding project effectiveness, the traffic volume of the rural roads that were paved under the project increased significantly, travel time on them has been shortened, and access to various facilities has improved. Shipments of agricultural produce have also increased. Local residents have shown high levels of satisfaction with other facilities that have been developed or improved under the project, including rural markets known as GCs, UPCs, and boat landing stages/ghats. Expected positive impacts of the project have been clearly ascertained by the beneficiary survey, as well as the Effect Monitoring and Evaluation Survey that was conducted as an incidental to this ODA loan project. These impacts include more employment opportunities and increased income for local residents and an improved status of rural women. For all these reasons, both the effectiveness and impact of the project are high. While the project cost stayed within the planned budget, the project period exceeded the plan. Therefore efficiency of the project is fair. No major structural problems or technical problems have been observed in the operation and maintenance of this project but some financial problems have been observed. Hence, the sustainability of the project impact is fair.

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

[44] It means that maintenance condition of the project roads is not perfect, in particular.

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

The sustainability evaluation has found that the road maintenance budget was insufficient. In this context, the Bangladeshi government announced in January 2013 a new maintenance policy that gives priority to roads that have been constructed or upgraded with assistance from major donors including Japan. It is hoped that this policy will be fully implemented so that the repair and maintenance work will be promoted for all roads that have been upgraded under the projects, including any that have not been left in a state to be desired.

4.2.2 Recommendations to JICA

None.

4.3 Lessons Learned

1) Attentive care for poor women: With a strong awareness that poor women are important beneficiaries, this project hired them to perform road maintenance work and made arrangements so that their improved living standards would be maintained with continued employment even after its completion. As a result, a substantial number of women saw their economic conditions improve. They even attempted to become independent business owners, with more than a few of them succeeding. Such attempts are rarely heard of in other countries and should provide a good practice that will be useful for road projects in other governments that face similar poverty problems.

2) The operation and management method suitable for a project containing many and scattered project sites: In this project, most public works proceeded smoothly[45], although there were complexities in contractual and managerial aspects that rendered the project prone to problems. The complexities include the following: small project sites were widely distributed; and the project engaged nearly 500 construction firms as contractors. Behind this success were the following facts.

The project adopted standardized specifications in building roads, culverts and markets.

The project area was made up of nine project districts. With regard to those project districts, in addition to project monitoring at the central level, each came under the responsibility of the district executive engineer as its manager. Moreover, consultants, who were field engineers, also engaged in the monitoring and quality control of the project activities in those nine project districts. Furthermore, at the Upazila level, officials at the executing agency were assigned as people in charge of monitoring, and visited project sites often.

[45] The duration of the project was 55% longer than planned. However, many of the causes of the delays in the project were external factors (see page 19 in the main text).

It would be effective that JICA confirms and discusses the following three points with the executing agencies in conducting rural road construction projects similar to this project with many scattered project sites at the time of project formulation and appraisal. The three points are i) the standardization of technical specifications, ii) the establishment by the executing agency of a detailed managerial system that covers all necessary levels including the project sites, and iii) the appropriate monitoring system by local consultants.

Annex 1. Effect Indicators (AADT) – Original targets and Results –

Transport modes		Baseline (2004)[*1]	Target (At planned completion: 2009)[*1]	Actual (At completion: 2011)[*2]
Motor Cycle		71	105	211
Auto-rickshaw		65	145	241
Jeep/Car/Taxi		15	22	83
Pickup/Microbus		19	45	95
Bus/minibus		8	20	60
Truck/Tractor		23	35	75
Bicycle		151	270	490
Rickshaw		130	155	443
Number of pedestrians	Men	353	180	293
	Women	93	40	

Source: *1. Appraisal documents
*2. Answers to the questionnaire for the executing agency

Comparison of the Original and Actual Scope of the Project

Items	Original	Actual
1. Project Outputs		
(1) Civil Works		
1) Upgrading Upazila Roads (UZRs)		
a. Pavement	1,069 km	934 km
b. Bridges and Culverts	5,123 m	6,830 m
c. Tree Plantation and Care Taking	1,069 km	885 km
2) Upgrading of Union roads (UNRs)		
a. Pavement	120 km	108 km
b. Bridges and Culverts	1,400 m	473 m
c. Tree Plantation and Care Taking	120 km	108 km
3) Construction of Submersible Roads	45 km	45 km
4) Improvement of GCs	67 locations	67 locations
5) Upgrading of Boat Landing Stage/Ghats	20 locations	18 locations
6) Construction of UPCs	73 locations	67 locations
7) Extension of LGED Functional Building	2,500 m^2	2,500 m^2
(2) Procurement of equipment and vehicles	362	402
(3) Training		
1) Contracting NGOs (M/M)	360	360
2) Training for LGED officials, etc.	39,826 man-days	35,830 man-days
(4) Consulting services (M/M)	651	785
2. Project Period	March 2005 – March 2009 (49 months)	March 2005 – June 2011 (76 months)
3. Project Cost		
Amount paid in foreign currency	398 million yen	502 million yen[*1]
Amount paid in domestic currency	14,969 million yen	14,656 million yen[*2]
(Amount paid in local currency)	8,091 million taka	13,028 million taka
Total	15,367 million yen	15,158 million yen
Japanese ODA loan portion	11,345 million yen	11,193 million yen
Exchange rate	1 taka = 1.85 yen (As of October 2004)	1 taka = 1.125 yen (Weighted average of exchange rates between March, 2005 and June, 2011)

Note: *1, *2: Estimated figures.