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

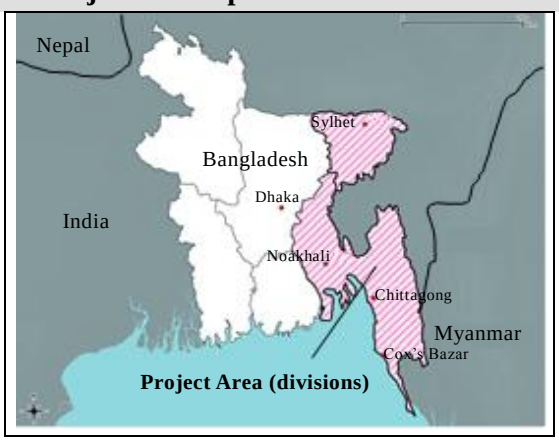
0. Summary

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.