Ex-Post Evaluation Report of Japanese ODA Loan Projects 2009 (Sri Lanka, Bangladesh)

November 2010

JAPAN INTERNATIONAL COOPERATION AGENCY

Ernst & Young Advisory Co., Ltd.

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 2007. 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.

November 2010
Atsuro KURODA
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.

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

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.

Ex-Post Evaluation Report of Japanese ODA Loan Projects 2009 (Sri Lanka, Bangladesh)

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Sri Lanka

Small Scale Infrastructure Rehabilitation and Upgrading Project I & II

Sri Lanka

Ex-Post Evaluation of Japanese ODA Loan Project
"Mahaweli System C Upgrading Project"

Hisae Takahashi
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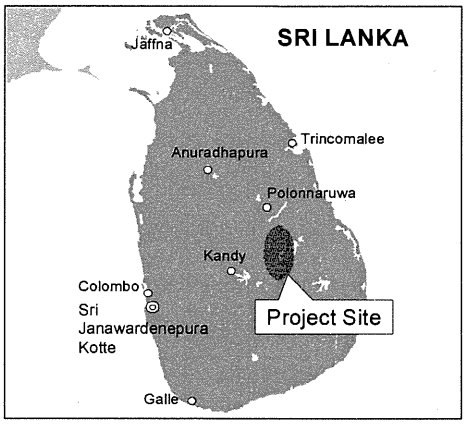
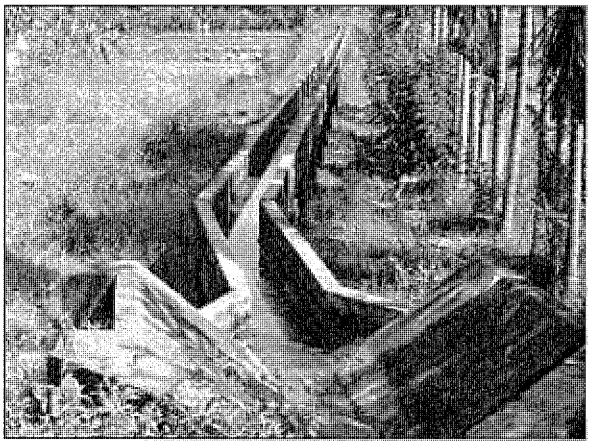
1. Project Description



Map of Project Area



Rehabilitated D-F Canal of Irrigation Scheme

1.1 Background

The Mahaweli System C area was included in the Mahaweli Ganga Development Project which was implemented to solve the severe food and power shortages in the late 1960s. The Japan International Cooperation Agency (JICA) and the World Bank (WB) implemented the joint financing projects of Mahaweli Development Project I and II and supported the construction of an irrigation system in the Mahaweli System C area. As a result, the settlement of 20,000 families and the production of farm products were achieved in this area.

On the other hand, the agricultural sector of Sri Lanka at that time absorbed a large part of the national budget, and in particular the cost devoted to the irrigation facilities caused fiscal deficits. Based on this, the government of Sri Lanka introduced the idea of participatory agriculture management, and a policy of transferring the operation and maintenance of the end irrigation facilities to Farmers Organizations (FOs). The steps of this transfer were started in the Mahaweli System C area, and the Mahaweli Authority of Sri Lanka (MASL) executed the Program by its own funds in aiming for the establishment of an activation model for the FOs. However, the irrigation facilities that were becoming too old had to be repaired to transfer them to the FOs. Following this situation, Special Assistance for Project Sustainability (SAPS) was implemented in 1995 by JICA. As a result, the necessity of assistance capable of instilling self reliance in the FOs through the diversification of crops, improving productivity for crops like rice, agricultural financing for farmers, and so on was pointed out. In response to the results, the execution of this project in the Mahaweli System C area was

decided upon.

1.2 Project Outline

The objective of this project was to increase the productivity and the quality of paddy in the Mahaweli system C area by strengthening the FOs and agricultural management training, as well as the rehabilitation of the irrigation system, thereby contributing to the increase of the farmers' income.

Approved Amount / Disbursed Amount	3,737 million yen / 3,077 million yen
Exchange of Notes Date/Loan Agreement Signing Date	June 1997 / August 1997
Terms and Conditions	Interest Rate : 2.3% Repayment Period :30 years (Grace Period: 10 years) Conditions for Procurement : General Untied
Borrower / Executing Agency	Democratic Socialist Republic of Sri Lanka / Mahaweli Development Authority of Sri Lanka
Final Disbursement Date	November 2006
Main Contractor	—
Main Consultant	Nippon Koei Co., Ltd.

2. Outline of Evaluation Study

2.1 External Evaluator

Hisae Takahashi (Ernst & Young Advisory Co., Ltd.)

2.2 Duration of Evaluation Study

Duration of the Study: December 25, 2009 – November 29, 2010

Duration of the Field Study: February 24 – March 21, 2010 and June 12 – 30, 2010

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

3.1 Relevance (Rating: a)

3.1.1 Relevance with the Development Plan of Sri Lanka

The Public Investment Plan (PIP) 1996-2000 that was the development policy in Sri Lanka as of the time of the appraisal attached importance to the "Acceleration of economic growth" and "Impartial distribution of growth." One of the emphasized fields was "Investment in infrastructure in rural areas." Moreover, the policy for agriculture, forestry, and fisheries puts the priority issues as "Improvement of agricultural productivity and income", and placed importance on "Infrastructure maintenance management such as roads for irrigation and agriculture by farmers."

The Mahinda Chintana Ten Year Plan (2006-2016) that is the present development policy also aims at the "Improvement of basic infrastructure in rural areas" and "Regional development and poverty reduction through community development," including irrigation facilities, and it upholds "Securing food and income improvements to small-scale farmers" as a priority area.

In addition, the "Achievement of food self-sufficiency," "Improvement of the productivity for paddy," "Provision of agricultural loans," as well as "Participation of community-based organizations" have been placed as priority items in the Ten Year Development Project for Agricultural Policy. This project is expected to contribute towards rice production and increasing farmers' income through strengthening the FOs and the improvement of irrigation systems. Thus, the project corresponds to the national and other relevant development plans of Sri Lanka both at the times of the appraisal and ex-post evaluation, and its relevance is thus extremely high.

3.1.2 Relevance with the Development Needs of Sri Lanka

The concept of participatory agriculture management was introduced in Sri Lanka at the time of the appraisal, and a policy of transferring the operation and maintenance of the end irrigation facilities to the FOs was announced. However, the handing over of the on-farm irrigation facilities to the FOs with the participatory management concept may not be advanced unless rehabilitation work on the damaged facilities is properly carried out. Furthermore, strengthening the FOs in terms of credit, the procurement of inputs, and so on was necessary in order to secure the self reliance of the FOs.

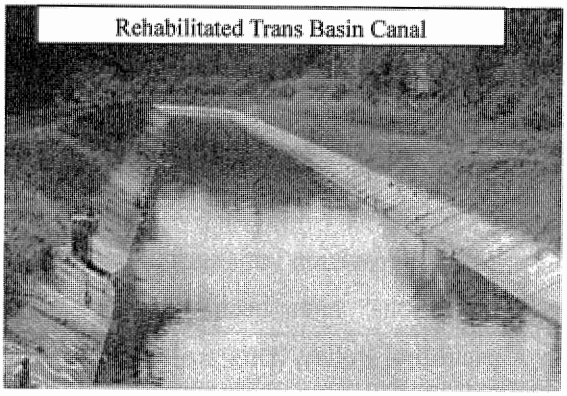
The major agricultural product in this area is paddy. The main farm product in the same region is still rice, and there is constantly a great need for the restoration of the end irrigation facilities where the productivity is to be improved. In addition, because the FOs are bearing the operation and maintenance of the end irrigation facilities as of now, needs and the importance for strengthening the FOs is high.

3.1.3 Relevance with Japan's ODA Policy

At the time of the appraisal, Japan's ODA policy towards Sri Lanka placed importance on the "Improvement of infrastructure for agriculture production" and "Increasing income in rural areas" for the development of agriculture, forestry, and fishing. In addition, JICA's assistance policy to Sri Lanka's agricultural sector was described clearly as follows, "Aiming to improve the efficiency of existing facilities instead of the construction of new or large scale agricultural facilities." It is important to aim to improve the living standard and income level of farmers, which account for the majority of the population. Since the project aims to increase the income of farmers through the refurbishment of existing irrigation facilities, its relevance with Japan's ODA policy for the agricultural sector in Sri Lanka is consistent.

Thus, this project has been highly relevant with the country's development plan, development needs, as well as Japan's ODA policy, therefore its relevance is high.

3.2 Efficiency (Rating: b)


Rehabilitated Trans Basin Canal

3.2.1 Project Output

The project consists of the following: strengthening of FOs, construction of an agricultural management training center, rehabilitation of irrigation canal systems, and consulting services for project implementation. The table below shows the actual output in comparison with the original plan.

Table 1: Comparison of Planned and Actual Outputs

Output	Original Plan	Actual Plan
1. Strengthening of FOs		
(1) Restoration of D-F [Note 1] Canals	7,200 D-F Canals	7,200 D-F Canals
(2) Credit Facilities (Agricultural Loans)	1) Expansion of Group Cultivation Loans 2) Relief Scheme for Defaulters 3) Improvement of the Institutional Support System 4) Enterprise & Operation capital loan for the FO Federation 5) Revolving Fund	1) Revolving Fund
(3) Construction and Rehabilitation of Storage Facilities	1) Refurbishing of WFP [Note 2] Warehouses 40 nos. 2) Farm Input Storage Facilities 9 nos. 3) Agricultural Product Storage Facilities 9 nos.	1) Refurbishing of WFP Warehouses 25 nos.
2. Construction of Agricultural Management Training Center		
(1) Training Center	Construction of Training Center	Refurbishment of Training Center
(2) Procurement of Equipment	Procurement of Agricultural Machinery, Office & Teaching Equipment, Access Roads, Facilities Supplying Water & Electricity	Procurement of Agricultural Machinery, Water-supply System, Access Roads, Fences & Roads for Farms, Canals in Farms
3.Rehabilitation of Facilities		
(1) Trans-basin Canal [Note 3]	Rubber Seal Stop Log Concrete Lining Mastic Filter Joint Filter Under Drain Pipe	Gate Rehabilitation Work Stop Log Fabrication Work Rehabilitation of Stop Log House Replacing by Pass Gates Repairing Skin Plates & Girders Rehabilitation of O&M Road Trans-basin Canals and Floodgate
(2) Zone 3-6 [Note 4]	Concrete Lining 20 km Gate Replacement 80 nos. Earth Works & Weed Removal for Canal System	Concrete Lining 20 km Gate Replacement 80 nos. Ulhitiya Spill Tail Improvement Hungamala Ela Drainage Improvement Further Improvement of Irrigation Facilities Improvement of the Water-supply System Rehabilitation of Main and Branch Canals

(3) Procurement of O&M and Office Equipment	O&M Equipment Equipment for Project Management	Revised the actual requirement and changed the type and quantity within the budget.
(4) Consulting Services	501 M/M Monitoring & management of project activities Plan, implementation & monitoring of all activities in connection with FOs Survey, design and construction supervision of project facilities	537 M/M

Note 1: D-F Canal indicates end irrigation waterways called "Distribution Canals" and "Field Canals." In addition, each FO member of an FO is a farmer in this distribution waterway downstream. Field Canals indicate the waterway where the Distribution Canals exists further in the downstream.
Note 2: WFP is an abbreviation of World Food Program.
Note 3: Trans-basin canals indicate main irrigation canals where the reservoir, etc., and the end irrigation waterway are connected.
Note 4: There is Zone 1-Zone 6 in the Mahaweli C area, and the target areas of this project are the four Zones of Zone 3-Zone 6. In these four zones, there are six blocks, and each FO belongs to each block.

As shown in Figure 1, this project targeted the Mahaweli System C area which is situated along the right bank of the Mahaweli River. The basic designs outlined by the appraisal were reviewed based on the local situations when this project was implemented, and the consequent major modifications were as follows.

1) Credit Facilities (Agricultural Loan Scheme)

As of the time of the appraisal, the government of Sri Lanka had taken a policy decision to "write off cultivation loans[1]". At that time, write offs were repeatedly conducted by the government, and consequently there were a lot of farmers who had the recognition that "Loans where public support was received do not need to be repaid" or "It is capital similar to a subsidy." Under such circumstance, MASL judged that it was inappropriate to implement such programs and only the revolving fund scheme was executed.[2] Loan schemes implemented under this project were not covered by the government policy to write off cultivation loans. Considering the fact that the write off of cultivation loans was frequently implemented, and subsidies to farmers were introduced by the government, it was appropriate to scale down the agricultural loan scheme.

2) Construction/Refurbishing of Storage Facilities

As of the time of the appraisal, 40 storage facilities were planned to be refurbished or constructed, however the Resident Project Manager (RPM) of the Mahaweli C area of MASL decided to reduce this to refurbishing 25 storage facilities based on their past experiences. The main reasons for this change were decided due to the lack of the capacity of the FOs which were to

[1] Cultivation loans are loans which are used for purchasing seeds or fertilizer by farmers.
[2] Under this project, only the revolving fund scheme was supported among the five originally planned credit schemes. However, some credit schemes such as the "expansion of group cultivation loans" and "enterprise and operation capital loans for FO Federations" were partially included in the revolving fund system. Moreover, for the implementation of the revolving fund, the Sri Lankan side proposed that the overall operation be managed by MASL and that operations such as loans and upgrades would be carried out by Sri Lankan banks (Uva Development Bank and Rajata Development Bank). This received approval from the JICA side and the scheme was implemented.

take responsibility for operation and maintenance after project completion. According to the beneficiary survey to farmers, the lack of storage facilities was partially confirmed. However, it is a realistic and appropriate change that is based on the current state of the operation and maintenance capacity viewpoint of the FOs.

3) Construction of the Agricultural Management Training Center

For the agricultural management training center which was scheduled to be newly constructed, this was changed from construction to refurbishing the existing facilities. While this had been used for another purpose at the time of the appraisal, the facilities were not in use at the time of project implementation,[3] so this was done in order to utilize the existing facilities. As for the provision of equipment to the facilities, the part types, models, and so on were altered in accordance with the on-site conditions. These were realistic modifications based on the actual conditions, and the claim could be made that they were beneficial in improving project efficiency by means of leading to cost reductions.

4) Additional Work for the Rehabilitation of Facilities (Ulhitiya, Hungamala)

In Ulhitiya and Hungamala, which were the target areas, agricultural roads would overflow with water and farm work would fall into arrears on account of the rising waters and flooding from the heavy rains in the rainy season. For this reason, there was a need to quickly install and improve canals. Here, the installation of canals was added in two locations deemed to be indispensable for the resumption of farm work in the surrounding area. This was also an appropriate change based on the current conditions.

5) Consulting Services

As per the extension of the project period, the assignment period for the consulting services was also extended from 501M/M to 537M/M. Since consultants played an indispensable role in the course of the project implementation, the increase in the M/M of the consulting services with the extension of the project period was considered reasonable and appropriate. Other than this extension, the consulting services were executed as planned without any problems.

6) Others

For the repairs of the trans-basin canals, the current situation was surveyed at the time of the start of the project, which produced slight changes to the contents of the refurbishments in order to meet the local needs. Furthermore, in Zones 3-6 the earth works and weed removal work that had initially been scheduled to be carried out were cancelled. Because this work is work that arises on a

[3] The agricultural management training center was revised from the construction of new buildings to the refurbishment of the existing building. This facility had been fully utilized for seed production. Subsequently, this activity was diminished and died down due to the changes brought about by privatization. Consequently, the facility had been lying idle and the plan was revised in order to put the existing facility into effective use.

daily basis and which the FOs handle voluntarily, and as such it was not included as a component of this project. These are minor changes, and do not impose factors that are detrimental to the achievement of results.

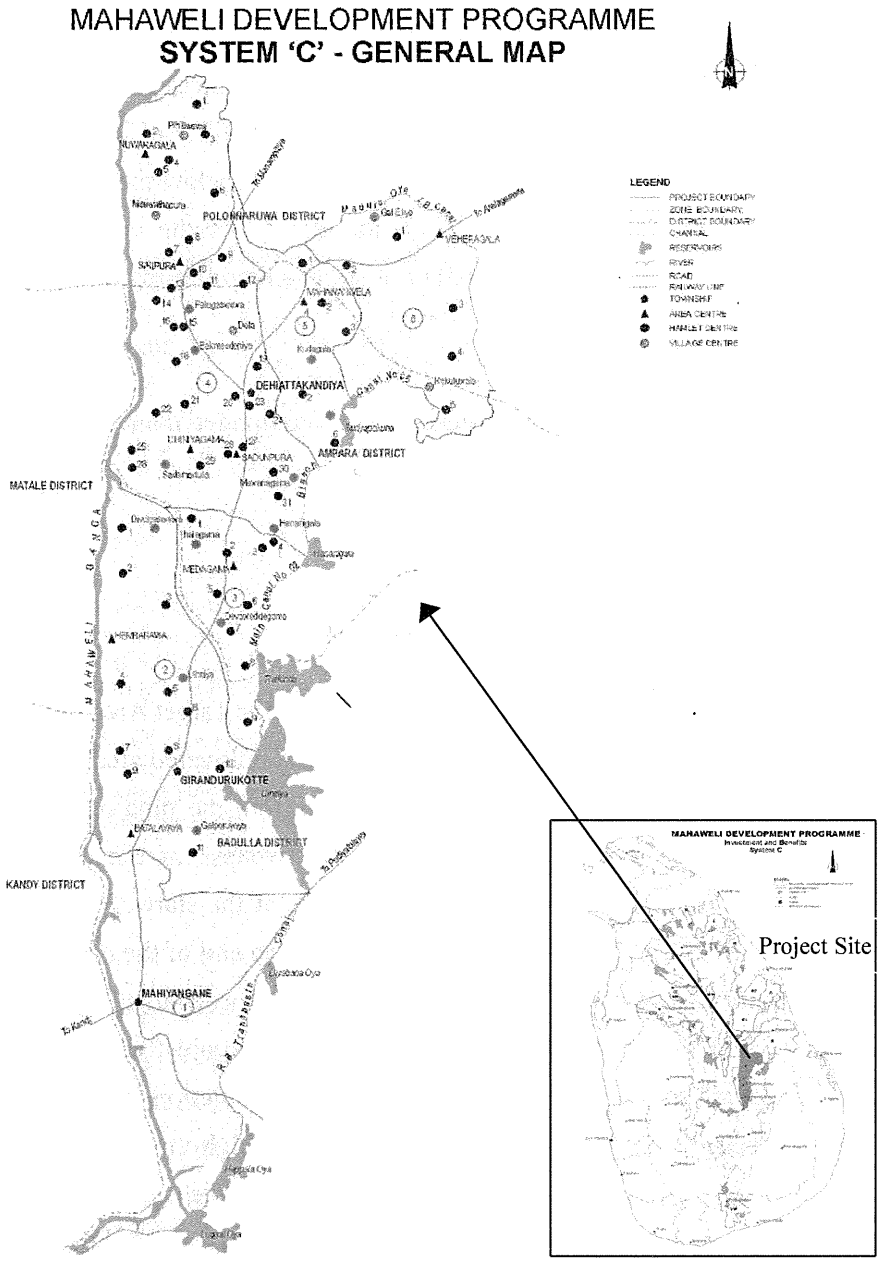


Figure 1: Mahaweli System C Area

3.2.2 Project Inputs

3.2.2.1 Project Period

Under the original plan, the project period was to last from August 1997 to November 2004 (88 months), but the actual project period was August 1997 to November 2006 (112 months), which turned out to be 27% longer than planned. The major reasons for the implementation extension

include: (1) about one year and a half's delays in the consultant selection[4] and delays in the initiation of sub-projects (repair and construction work) due to the delays in the consultant selection, and (2) the lack of human resources due to the reform of MASL.[5]

3.2.2.2 Project Cost

The planned project cost was 4,396 million yen (of which the Japanese ODA loan accounted for 3,737 million yen), and the total project cost at the time of the ex-post evaluation was 3,544 million yen (of which the Japanese ODA loan accounted for 3,077 million yen), which was 19% lower than planned. The reason why the project cost fell below the original plan even though the project period was extended originates in the change of the construction of the agricultural management training facilities, the number of storage facilities restored, and a great change in the exchange rate[6]..

As mentioned above, although the project period was longer than planned, the project cost was lower than planned, therefore efficiency of the project is fair.

3.3 Effectiveness (Rating: a)

3.3.1 Quantitative Effects

3.3.1.1 Results from Operation and Effect Indicators

(1) Paddy Yields, Cultivated Area, and Production in the Target Area

Table 2 shows the summary of changes in the yield, cultivated area, and production of paddy in the Mahaweli system C area. Although documents from the time of the appraisal did not show any qualitative indicators demonstrating the effectiveness of the project, officials of MASL mentioned in interviews that there were discussions at the start of the project over making it a goal to set 5.0 Mt./ha[7] as the unit yield for paddy by the end of the project. Owing to this point of view, this figure was set as the planned value in this ex-post evaluation.

The unit yield for paddy in 2006, the year that the project completed, came to 5.4 Mt./ha, thereby exceeding the planned value. Following the completion of the project, the unit yield has risen up through the present, and the target area has a high unit yield relative to the nationwide average as well. Moreover, the project period for this project was initially scheduled to end in 2005. Considering that this figure (5.3 Mt./ha) had already exceeded the planned value as of 2005, it can be confirmed that the project was highly effective.

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[4] As explained, the Government envisaged the restructuring of MASL. The delays in the selection of consultants were affected by the administrative confusion caused by this restructuring process to some extent.

[5] Delays in the consultant selection and in the initiation of sub-projects affected the schedule of the construction and refurbishment of irrigation facilities. Ordinarily it is necessary to dam up canals in order to carry out the construction and refurbishment of irrigation facilities, and so these cannot be carried out during the cultivation season. Because the start period for the sub-projects was delayed and the work could not begin during the fallow period as scheduled, the project was faced with the situation of having to wait until the next fallow period.

[6] The exchange rate at the time of the appraisal was 2.09 yen to 1 rupee. Then it changed to 1.13 yen to 1 rupee by the time of the completion of the project.

[7] Mt. is the abbreviation for Metric Ton, which is a unit that expresses weight. 1 Mt. is equivalent to approximately 1,000 kg.

Planned values were not set for the irrigated area nor for the production volume. But from the table below it can be seen that the figures from the time of the appraisal onward have been improving year by year.

Table 2: Change in the Paddy Yield and Cultivated Areas

Indicator	Unit	1996	2005	2006	2007	2008	2009
Yield of Paddy	Original Plan: 5 Mt./ha (At the time of project completion)						
Maha [Note 1]	Mt./ ha	4.1	5.4	5.1	5.6	5.5	6.0
Yala [Note 1]		4.2	5.2	5.6	5.6	5.8	5.8
Average of target area		4.1	5.3	5.4	5.6	5.6	5.9
National average		3.5	4.0	4.1	4.3	4.1	4.4
Cultivated Area	No Original Plan						
Maha	1,000 ha	20.9	22.7	22.1	21.1	22.0	22.8
Yala		19.0	18.6	20.2	22.1	21.2	9.2
Total		40.0	41.3	42.3	43.2	43.2	31.9
Production	No Original Plan						
Maha	Mt.	84.7	108.3	100.3	107.2	107.9	122.4
Yala		78.9	86.7	102.5	112.7	110.2	47.7[Note 2]
Total		163.6	195.0	202.8	219.9	218.1	170.0[Note 2]

Source: MASL Web site http://www.mahaweli.gov.lk/Other%20Pages/Statistics.html
Note 1: The cultivation period of the agriculture of Sri Lanka is divided into two terms, namely the Mala period (northeast monsoon in October - March) and the Yala period (southwest monsoon in April - September). Rain is brought only to the southwest in the Yala period and to the entire island in the Maha period.
Note 2: Production in 2009 stayed at a slight increase due to the influence of the drought of the Yala period compared with production in 1996. However, it can be confirmed that production in 2007 and 2008 was 218.1(1,000 tons) and 219.9 (1,000 tons), respectively.
Note 3: Figures don't match in average/total because of the rounding.

(2) Strengthening of FOs

It is difficult to measure the strengthening of the FO's institutional capacity in figures. However, changes in the capital amounts accumulated by the FOs were taken up as one example for interpreting the capacity of the FOs in this ex-post evaluation. These capital amounts are accumulated from the membership fees to each FO and from part of the contract fees from when the FOs handle repair work on the irrigation facilities, and they are used for the activity fees of each FO. This increase in capital amounts leads to an increase in the operation and maintenance expenses for the irrigation facilities, as well as the completeness of the FOs' activities. As such, this can be thought of as having increased the financial capabilities of the FOs.

The target area of this project in the Mahaweli System C area is comprised of six blocks, with FOs that belong to each of these blocks. Table 3 below shows the capital amounts accumulated by the FOs in each block, as well as the number of FOs and the number of households for each block as basic information. In terms of measuring the changes in the capital amounts, baseline values (from the start of the project) could only be obtained from two of the blocks. Yet even so, the Siripura block increased its value by approximately 1.3-fold, while the Medagama block

increased its value by more than four-fold.

Table 3: Number of FOs and Households, and Capital Amount of FOs

Block	Number of FOs	Total Number of Households		Capital Amount(1,000 rupees)	
		As of appraisal	Actual	As of appraisal	Actual
Sadunpura	35	2,827	4,516	N/A	4,356
Siripura	20	2,935	3,103	572	719
Nuwaragala	18	2,349	2,826	N/A	2,474
Medagama	20	2,056	2,600	684	2,819
Mahawanawela	30	2,422	2,318	N/A	2,923
Veheragala	21	1,730	1,922	N/A	4,242
Total	144	14,317	17,285	-	17,533

Source: RPM, MASL

3.3.1.2 Results of Calculations of Internal Rates of Return (IRR)

The Economic IRR (EIRR) was calculated at the time of the appraisal and at project completion. At the time of the ex-post evaluation, when the actual figures were calculated via the same preconditions, the results exceeded the planned values as shown below.

Table 4: EIRR

	Plan	Project Completion	Actual
EIRR	22.0%	16.2%	27.8%

Note: Cost = Investment cost, Replacement cost, Maintenance cost, Benefit = Production, Price, Gross income, Production cost, Net income

3.3.2 Qualitative Effects

(1) Beneficiary Survey

A beneficiary survey was conducted at Zones 3-6 in the Mahaweli System C area to confirm the qualitative effects. One hundred and four farmers responded and the following points were confirmed as a result of this survey.[8]

1) Sufficiency of Water for Agriculture

About 90% of the respondents replied that they are now able to obtain a sufficient volume of water for the production of agricultural product due to the implementation of this project. The problem of disputes concerning the volume of water being used by neighboring farmers frequently arose, especially in the dry season when water is in short supply. But since concrete lining was applied to the canals through this project the volume of water lost from the irrigation canals has decreased, and as a result this problem has currently been resolved.

[8] The distribution of respondents is as follows.

Block	Sadunpura	Siripura	Nuwaragala	Medagama	Mahawanawela	Veheragala	Total
Number of responses	18	19	27	4	25	11	104

[QN] Do you think that the volume of water released is enough for purposes of cultivation after the project?	Yes	No
	92(88%)	12(12%)

2) Strengthening the FO's Institutional Capacity

Of the respondents, 98% replied that the FOs are taking responsibility for managing the D-F canals. In addition, 67% of the respondents answered that the implementation of the project had contributed to improving the capacity of the FOs. More specifically, they indicated that the FOs performed rehabilitation work on the D-F canals themselves, in addition to which the remuneration from this was accumulated by the FOs as capital. It was also pointed out that the FOs acquired fundamental technical skills related to the operation and maintenance of facilities through this experience, and that even afterwards the FOs were performing maintenance on the canals themselves. Moreover, even later on there were examples given wherein the FOs had carried out their own unique activities[9] and established maintenance funds based on this capital. Additionally, it was also claimed that having the FOs take part in maintenance work on the D-F canals themselves had benefits like developing ownership among the FO members and raising their awareness with regard to maintenance (from interview surveys with the beneficiaries).

[QN] Do you think the FOs take responsibility for maintaining D-F canals?	Yes	No
	102 (98%)	2 (2%)

[QN] Do you think the capacity of the FOs has increased after the implementation of the project?	Yes	No
	70 (67%)	34 (33%)

3) Access to Agricultural Loans

With regard to agricultural loans, 65% of the respondents answered that they do not access such loans, and so it would be difficult to claim that results from the project's implementation have been fully realized. The use of the revolving fund is limited to uses related to agriculture. It was used by many of the FOs because they could procure capital for a low interest rate while the project was being implemented. But currently the number of users is on a downward trend due to the fact that the government has started providing subsidies for purchases of fertilizer, and because the interest rates were hiked up following the completion of the project.

[QN] Do you think that you can access agricultural credit easier after the implementation of the project?	Yes	No	Not Accessed
	35 (35%)	0 (0%)	69 (65%)

[9] For instance, the scholarship was set up for FO members' children to go to school, and contributions at funerals were offered and so on.

4) Quality of Paddy

Those engaged in agriculture who responded that the quality of the paddy had improved did not rise above 22%. According to respondents who sat for interviews, their order of priorities from when the project was implemented was not on improving the quality of the paddy, but rather on expanding the production output. As such, they had little in the way of awareness when it came to the quality of the paddy. What is more, the quality of the paddy depends on a variety of factors, such as the amount of foreign matter like stones and waste mixed in with it, the percentage of paddy harvested from the rice plant, its weight, and the variety of paddy. As a result, it was difficult to determine whether or not this project had directly contributed to improving the quality of the paddy.

But after the implementation of the project the farmers were able to obtain the proper volume of water for cultivation, and the production output and revenue rose year by year. Because of this, in recent years the project started dealing with appropriate ways of using things like agricultural fertilizers. Responses were received to the effect that presently this has allowed the farmers to be on their way toward improving the quality. One respondent gave the opinion that, "This project showed us the way when it comes to improving the quality of the paddy."

[QN] Do you think that the quality of the crops has improved after the project?	Yes	No
	23 (22%)	81 (78%)

Thus, this project has largely achieved its objectives, therefore its effectiveness is high.

3.4 Impact

3.4.1 Intended Impacts

As can be seen from the above, the unit yield for paddy in the target area by the project improved remarkably after the project. The extent to which productivity improvements contributed to both raising household income and the growth of the agricultural sector in the area were confirmed in the following manner.

(1) Changes in Household Income

Table 5 below shows the trends in the household income of residents in the targeted area. Household incomes in the year 2008 in the targeted area rose substantially compared to before the implementation of the project. But it is believed that the reason why the growth rate in income in 2008 was particularly high is also partially because of the impact from the rise in the cost of paddy in this same year.[10]

[10] While the producer's price of paddy was 13.3 rupees per kg in 2005, this fell to 12.8 rupees per kg in 2006 and then rose to 18.8 rupees per kg in 2007. In 2008 this rose to 32.6 rupees per kg due to the steep jump in domestic market rates.

Table 5: Average Household Income in the Mahaweli System C Area

(Unit: 1,000 rupees)

	1997	2006	2007	2008
Household Income (actual)	92.4	118.4	164.0	273.4

Source: MASL Web Site, http://www.mahaweli.gov.lk/Other%20Pages/Statistics.htm

In the beneficiary surveys, about 60% of the respondents answered that their revenue had increased due to this project. Meanwhile, when this was confirmed with the respondents it was found that their income had increased by about 1.5-times on average. In terms of the reasons for this, maintenance on the canals leads to a drop in lost agricultural water and the yield for paddy rose were frequently heard. It is conceivable that the implementation of this project contributed to a certain extent to increase the incomes of the residents of this area.

Interview surveys with residents

(2) Growth in the Agricultural Sector

Since the completion of the project, the agricultural production output[11] for the region has been on a rising trend, and growth in the agricultural sector of the targeted area can be confirmed. Furthermore, in the results from the beneficiary surveys, a little less than about 90% of the respondents answered that the project had contributed to their agricultural activities. They indicated the fact that the enlargement of agricultural production brought about by the results of this project led to growth in the agricultural sector of the area.

Table 6: Agricultural Production in Mahaweli System C

(Unit: Mt)

	1997	2006	2007	2008
Production	195,745	209,613	227,682	228,324

Source: MASL Web site http://www.mahaweli.gov.lk/Other%20Pages/Statistics.htm

3.4.2 Other Impacts

According to the regulations of Sri Lanka from the time of the appraisal, this project did not require that an Initial Environmental Evaluation (IEE) or an Environmental Impact Assessment (EIA) be conducted, and it was deemed as not having any particular impact on the environment. Regarding the resettlement of residents and land acquisitions, these would not be problems as a small amount of land to construct new warehouses would be acquired and the resettlement of residents was not planned. When this was actually confirmed with the executing agency through this survey, it was confirmed that there were not any environmental problems or impact in relation

[11] Production output for paddy, as well as grains and vegetables which are referred to as Other Field Crops (OFC).

to land acquisition or resettlement of residents.

As outlined above, the implementation of this project in the target area led to enhancing agricultural water and an increase in paddy production by strengthening the FOs and refurbishing irrigation facilities. Based on these results, this project can be considered to have contributed to a certain degree to the realization of a number of impacts, such as improving the income of the residents and vitalizing agriculture in the targeted area.

3.5 Sustainability (Rating: b)

3.5.1 Structural Aspects of Operation and Maintenance

Following the completion of the project, operation and maintenance is to be overseen by the FOs for the D-F canals which are end irrigation canals and the storage facilities, and by the RPM for the agricultural management training center and the major irrigation facilities (trans-basin canals), respectively.

The FOs that will manage the D-F canals and storage facilities[12] will hold meetings at the time of the start of the cultivation season and decide on the necessary maintenance (mowing and the necessary measures). In cases where repairs and other such construction work is needed, the FOs will handle as much of the work as they can handle themselves after receiving the approval of the RPM. In addition, the RPM is in charge of maintenance for the agricultural management training center and large-scale major irrigation facilities. Through interviews with the RPM, it was learned that there is an adequate number of staff to take charge of the maintenance at present. However, during the reform of MASL it went through a process of substantial personnel cutbacks, and after the employees who have reached the retirement age retire in several years, it is estimated that there will be a shortfall of personnel to take charge of maintenance. A request to increase the personnel has already been submitted to MASL, but this issue is now considered to be pending, and there are some concerns that remain regarding the future structure.

3.5.2 Technical Aspects of Operation and Maintenance

It had been assumed that the FOs would use the Operation & Maintenance Manuals prepared by the consultants. Through the interview surveys it was confirmed that while the manuals had been stored, they were not being used effectively. But by giving the members of the FOs the opportunity to take part in the repair work through this project, they have acquired the fundamental technical skills and experience necessary for operation and maintenance of the D-F canals. As such, at present serious problems have not arisen with their techniques pertaining to the maintenance that the FOs should be taking charge of. However, the content that the FOs are capable of handling is limited to very basic repair work. Therefore, it has been decided that the RPM will provide technical support when such support for technical aspects are needed by the FOs. When RPM and

[12] The structures vary slightly depending on the FO, but in general each FO elects a representative, manager in charge of clerical work, manager in charge of financial affairs, manager in charge of water management, and a leader in charge of F-D canals. They primarily perform the operation and maintenance on the facilities.

FOs were interviewed, it was found that at present no serious problems have occurred since not a whole lot of time has passed after the completion of the project.

3.5.3 Financial Aspects of Operation and Maintenance

As in the operation and maintenance structure, the FOs are in charge of the D-F canals and storage facilities, and the RPM is in charge of the major irrigation facilities and agricultural management training center, regarding their financial aspects.

According to the Project Completion Report (PCR), the total annual operation and maintenance costs needed for the target facilities were estimated to be 15.5 million rupees. According to the interview survey with MASL, at present an adequate budget has not been secured. When MASL's budget for 2009 was actually confirmed, it was found that it had requested an amount of 33 million rupees as maintenance costs targeting the overall irrigation facilities in the Mahaweli C area, but in reality it had only received an amount of 21 million rupees.

Since the FOs cover the maintenance costs for the facilities, a Maintenance Fund (MF) was established after the implementation of the project. This MF was established by using 5% of the contract price from when maintenance work on the facilities is carried out by the FOs via free contracts through the project. Later on, it was mandated that a commission of 5% from the costs relating to maintenance work were to be accumulated in this fund. In addition, the FOs collect about 250 rupees on average from members each cultivation season as collection fees. The aforementioned commission of 5% and these collection fees are partitioned out to the FOs' capital funds (which are used as the FOs' activity funds) and the MF.[13] Since the maintenance costs differ for each D-F canal an accurate amount cannot be planned. But according to the interviews with the block offices and FO members, they explained that currently these collection fees are not enough to adequately cover the amount of the costs for operation and maintenance.[14]

3.5.4 Current Status of Operation and Maintenance

In the site visit the project evaluation, observations were conducted on the physical condition of the facilities and the actual state of their operation and maintenance concurrently with the beneficiary survey. The statuses of the training facilities, storage facilities, and irrigation facilities improved through this project were largely satisfactory. A slight amount of damage has occurred on the concrete lining of about 30% of the D-F canals targeted by this project. In order to avoid having this damage advance in the future, it will conceivably be necessary to carry out maintenance for the D-F canals. But the canals themselves are constantly functioning, and it was confirmed that there are no serious problems.

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[13] In 1994 the government entered the Irrigation Law and the Agricultural Support Law into force, and the FOs were vested with the authority to collect water supply fees (collection fees) from their members and to take action against members who have not paid.

[14] The collection fees paid to the FOs vary for each FO, but are around 250 rupees (about 186 yen) on average. When members of the FOs were interviewed it was learned that this amount had been kept at the same level for a long time, and it is not considered to be a high amount.

As mentioned above, some problems have been observed in terms of financial aspect, therefore sustainability of the project is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The actual project period was longer than planned. While minor concerns for future sustainability are observed in areas such as staffing and budgeting, this project has achieved its targets, for the most part such as increasing the cultivated area, increasing household income, and promoting agriculture in the target area.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

1) At present, slight damage to the concrete lining of some of the end irrigation facilities (D-F canals) has been confirmed. The canals are functioning without any difficulties, and currently this has not posed any serious problems. But there is the possibility that the situation will grow worse in the future. The maintenance work that the FOs are capable of handling is limited to simple construction work, and so if the extent of the damage were to grow more severe then it is assumed that it will be difficult for the FOs to handle this by themselves. Therefore, in order to prevent the situation from growing serious ahead of time it is desired that responses such as having RPM and MASL periodically provide technical guidance will be considered.

2) The FO's financial capabilities have improved remarkably compared to before the project was implemented. But it would be hard that even under the current situation the FOs are able to come up with sufficient costs for the proper maintenance of the irrigation canals. The thinking is that hereafter it will be indispensable to further strengthen the organization of the FOs in terms of their financial aspects in order to guarantee the sustainability of the irrigation facilities over a long time period. For example, in each cultivation season collection fees from the members (250 rupees) have been kept at the same level for a long time. When this was confirmed during the interviews it was thought that the 250 rupees paid during the cultivation season is not necessarily all that high of an amount considering the average income of the households. For this reason, examining raising FO collection fees to the acceptable level can be thought of as one idea.

4.3 Lessons Learned

1) The agricultural loan program was partially cancelled and the substantial reductions in the number of storage facilities constructed (partially repaired) were decided in this project, which were thought to be appropriate and minor changes. But, a substantial changes to the project

could have an impact on the schedule for the construction work and the project period overall. For this reason, when examining the outputs in similar project, it is considered important to make the content of the plan realistic in line with the needs. This should be done by performing sufficient coordination based on factors like the needs and issues of the beneficiaries in particular, as well as an understanding of the executing agency.

Comparison of the Original and Actual Scope

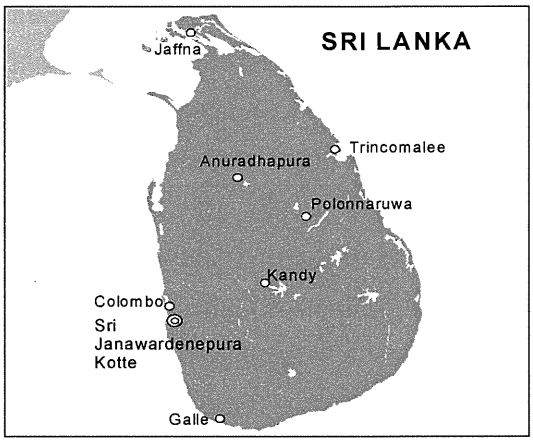
Item	Plan	Actual
(1) Output [Strengthening of the FOs]	– Restoration of D-F canals: 7,200 units – Credit Facilities (Agricultural Loan) 1) Expansion of Group Cultivation Loans 2) Relief Scheme for Defaulters 3) Improvement of Institutional Support System 4) Enterprise & Operation capital loan for FO Federation 5) Revolving Fund – Construction and Rehabilitation of Storage Facilities: 58 units	– Restoration of D-F canals: 7,200 units – Credit Facilities (Agricultural Loan) 1) Revolving Fund – Construction and Rehabilitation of Storage Facilities: 25 units
[Construction of the Agricultural Management Training Center]	– Construction of Training Center: 1 unit – Procurement of Equipment: 1 set	– Refurbishment of Training Center: 1 unit – Procurement of Equipment: 1 set
[Rectification of Facilities]	– Trans-Basin Canals Rubber Seal, Stop Log, Concrete Lining, Mastic Filter, Joint Filter, Under Drain Pipe – Zones 3-6 Concrete Lining 20 km Gate Replacement 80 unit Earth Works & Weed Removal of Canal System – O&M Equipment: 1 set	– Trans-Basin Canals Gate Rehabilitation Work Stop Log Fabrication Work Rehabilitation of Stop Log House Replacement by Pass Gates Repairing Skin Plates & Girders Rehabilitation of O&M Road/ Trans-basin Canals and Floodgate – Zones 3-6 Concrete Lining 20 km Gates Replacement 80 nos. Ulhitiya Spill Tail & Hungamala Ela drainage Improvement Further Improvement of the Irrigation Facilities & Water-supply System Rehabilitation of Main and Branch Canals – O&M Equipment 1 unit
[Consulting Services]	501 M/M	537 M/M
(2) Project Period	August 1997 - November 2004 (88 months)	August 1997 - November 2006 (112 months)
(3) Project Cost Foreign Currency Local Currency Total ODA Loan Portion Exchange Rate	 2,715 million yen 1,681 million yen (804 million rupees) 4,396 million yen 3,737 million yen 1 rupee = 2.09 yen (As of January 1997)	 707 million yen 2,837 million yen (2,128 million rupees) 3,544 million yen 3,077 million yen 1 rupee = 1.11 yen (Average in the Period from 1999 through 2002)

Sri Lanka

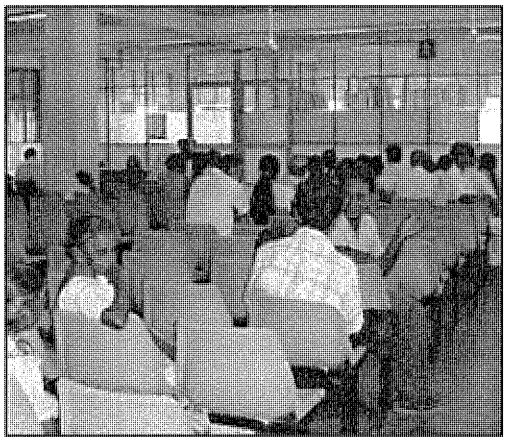
Ex-Post Evaluation of Japanese ODA Loan Project
"Small Scale Infrastructure Rehabilitation & Upgrading Project I & II[1]"

Hisae Takahashi
Ernst & Young Advisory Co., Ltd.

1. Project Description



Map of Project Area
(Target area: the whole of Sri Lanka)



Rehabilitated Waiting Room in Hospital

1.1 Background

In Sri Lanka, it was estimated that approximately 25%[2] of the total population was living below the poverty line as of 1995. The poverty rate in rural areas was double that of urban areas, thus the alleviation of poverty was a big issue in rural areas where approximately 70% of the population lived. At that time, poverty had several characteristics, namely (1) large families, (2) many people engaged in primary industries such as agriculture, (3) low education levels, (4) a lack of basic infrastructure such as water supply and electricity, (5) limited market access. Moreover, the civil conflict had continued for about 20 years and the Sri Lankan government was finding it difficult to allocate funds for regional development public work projects due to the shortage of funds. Under these circumstances, it was important to pursue balanced economic development by rectifying the disparities between regions and ethnic groups, in addition to showing consideration for the poor and the vulnerable, as the Sri Lankan government continued to promote the policy for poverty reduction. Thus, in order to increase the income and improve

[1] Small-scale Infrastructure Rehabilitation & Upgrading Project I and II have the acronyms SIRUP I and SIRUP II.
[2] It was assumed that the poverty ratio in the North Eastern Province was higher than in other provinces because the conflict had been more severe in the North Eastern Province. However, data from the North Eastern Province was not included and it is thought that the actual overall poverty rate was higher than the figure given.

the standard of living of people, agricultural development and the improvement of basic infrastructure as well as various types of social services were needed.

1.2 Project Outline

The objective of this project is to enhance social and economic development in rural and urban areas through rehabilitating and upgrading small-scale infrastructure for water, roads, irrigation, education, health and rural industrial sectors[3] in Sri Lanka.

Approved Amount / Disbursed Amount	[SIRUP I] 9,595 million yen / 9,595 million yen [SIRUP II] 11,776 million yen / 11,776 million yen
Exchange of Notes Date / Loan Agreement Signing Date	[SIRUP I] March 2003 / March 2003 [SIRUP II] December 2004 / December 2004
Terms and Conditions	[SIRUP I] Interest Rate: 2.2% per year Repayment Period: 30years (Grace Period 10 Years) Conditions for Procurement: General Untied [SIRUP II] Interest Rate: 0.75% per year Repayment Period: 30years (Grace Period 10 Years) Conditions of Procurement: General Untied
Borrower / Executing Agency	Democratic Socialist Republic of Sri Lanka / Ministry of Finance and Planning
Final Disbursement Date	[SIRUP I] March 2007 [SIRUP II] December 2008
Main Contractor	-
Main Consultant	-
Related Projects	"Special Assistance for Project Implementation (SAPI) for Small-Scale Infrastructure Rehabilitation and Upgrading Project (SIRUP)(2005)", "SAPI for SIRUP II(2006)"

2. Outline of the Evaluation Study

2.1 External Evaluator

Hisae Takahashi (Ernst & Young Advisory Co., Ltd.)

2.2 Duration of Evaluation Study

Duration of Study: December 25, 2009 - November 29, 2010

Duration of Field Study: February 24 - March 21 and June 12 to June 30, 2010

[3] SIRUP I supported water supply, irrigation, road & bridges, the education sector and SIRUP II supported the education sector, the health sector and the rural development sector.

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

3.1 Relevance (Rating: a)

3.1.1 Relevance with the Development Plan of Sri Lanka

"Regaining Sri Lanka[4]" was the development policy of Sri Lanka at the time of the appraisal. The "National Development Strategy (Connecting to Growth: Sri Lanka's Poverty Reduction Strategy)" was formulated in 2002 as part of the development policy "Regaining Sri Lanka." Both "Regaining Sri Lanka" and the "National Development Strategy" attached importance on "creating opportunities for pro-poor growth" and "investing in people (education, health, social protection, urban development, etc.)" in order to continue poverty reduction in Sri Lanka. Specifically, education, health and rural development were seen as giving direct benefits to the poor, thus "road development," "improvement of agricultural productivity," "supply of safe drinking water" and "human resource development" were prioritized.

The "Mahinda Chintana: Ten Year Plan" (2006-2016) which is the present development policy, also aims at rural development and poverty reduction. This policy has identified the "improvement of small-scale farmer incomes", "regional development and poverty reduction through community development programs", "supply of social services such as education, health and social security to the least developed areas" and "promotion of continuous support for the North Eastern Province and recovery from the Tsunami" as priority strategic areas.

As mentioned above, Sri Lanka's national policy consistently prioritized "poverty reduction." In particular, infrastructure development in the social service sector, which is thought to be of direct benefit to the poorest in the population, was identified as an important issue. Thus the project corresponds to the national and other relevant development policy of Sri Lanka both at the times of the appraisal and ex-post evaluation, and its relevance is extremely high.

3.1.2 Relevance with the Development Needs of Sri Lanka

At the time of appraisal, projects which aimed at poverty reduction were considered critical issues since it was estimated that approximately 25% of the total population were living below the poverty line. In particular, the lack of basic infrastructure in affected areas hindered poverty reduction, thus infrastructure development to improve access to markets as well as to improve the living environment was essential. In addition, Sri Lanka had been struggling with a long-lasting civil conflict between the Government and the Liberation Tigers of Tamil Eelam (LTTE), and the increase in social security cost due to the population growth. Thus, the government of Sri Lanka has struggled to allocate adequate funds for public works projects which contribute to regional development.

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[4] Regaining Sri Lanka was introduced in 2002 as a framework of development policy for five years.

Though poverty is currently decreasing in Sri Lanka[5], poverty reduction in rural areas remains as an unsolved critical issue. The results of a family budget survey conducted in 2006/07 found common features in the characteristics of poverty to the ones found in the appraisal. The survey also concluded that there is a need for agricultural development, the improvement of basic infrastructure and social services in order to improve income and the standard of living.

This project aims at improving the living standards in rural areas by developing small scale infrastructure. Thus the need for this project was high both at the time of appraisal and at the ex-post evaluation.

3.1.3 Relevance with Japan's ODA Policy

At the time of appraisal, Japan's country specific assistance policy toward Sri Lanka considered "funding for infrastructure development," " industrial development," "support for poor people" and "support for the northern and eastern regions" as priority areas and had a plan to support road development and the development of infrastructure in rural areas such as irrigation, education and health facilities. "The Medium-Term Strategy for Overseas Economic Cooperation Operations" also set forth the following areas as priority areas: "increasing support for poverty reduction," "developing the foundations for economic growth," "support for human resource development" and "support for rural development." Therefore, the project policy corresponds to the strategy. In addition, the significance of the project for supporting the northern and eastern regions was emphasized in the appraisal because there was an ongoing civil conflict in the region at the time. Although this conflict ended in 2009, there is no change in the significance of supporting the northern and eastern regions as part of the reconstruction assistance and the issues to be tackled.

This project has been highly relevant with Sri Lanka's development plan, development needs, as well as Japan's ODA policy, therefore its relevance is high.

3.2 Efficiency (Rating: b)

3.2.1 Project Outputs

This project is composed of (SIRUP I) water supply, irrigation, roads and education, and (SIRUP II) education, health, rural development, and the soft component. Planning and the actual output (number of sub-projects)are shown below.

Table 1: Comparison of Planned and Actual Outputs

	Planned	Actual

[5] 16 % of population of Sri Lanka is in blow the poverty line in Sri Lanka as of 2006/07.

SIRUP I		Number of sub-projects
(a) Water supply scheme	250	71 (NWSDB) [Note 1] 169 (CWSSP) [Note 2]
(b) Rehabilitation of irrigation Scheme	29	25
(c) Roads [Note 3] (RDA): Rehabilitation of national highways and bridges Roads (Maganaguma): Rehabilitation of community roads	68 (1,530 km) (35 bridges) -	180 (RDA) (1,093 km) (30 bridges) 2,765 (Maganaguma) (1,478 km)
(d) Education improvement programme	237	260
SIRUP II		Number of sub-projects
(a) Education: Upgrading & rehabilitation of education and training facilities, improvement of school management	2,574	6,446
(b) Health: Upgrading & rehabilitation of health facilities (OPD, wards, surgeries, toilets & laboratories, water supply, electricity supply and procurement of equipment)	397	3,258
(c) Rural development: Upgrading of infrastructure facilities	14	8
(d) Soft component	-	• Health education promotion • Standardization of biomedical equipment • Implementation of MIS

Note 1) NWSDB indicates a water supply scheme which was implemented by the National Water Supply & Drainage Board.

Note 2) CWSSP is an abbreviation of the Community Water Supply & Sanitation Project.

Note 3) Maganaguma (construction and renovation of community roads) was later added to the road sector activities in the project in addition to the repair and the restoration of national roads over which the Road Development Authority (RDA) had jurisdiction.

The project financed small-scale sub-projects (SPs) in multiple sectors. The project was highly flexible in the sense that high priority SPs were selected in accordance with the latest local conditions and local needs[6]. Therefore, the number of planned SPs at the time of the appraisal and the number of actual SPs do not necessarily need to match. In the entire project, the number of SPs increased by about 3.7 times the planned number of SPs, while the average size (cost) of each SP decreased to about 35% of the planned size. Therefore, each SP was downsized in general.

[6] The five criteria for selecting SPs included the following: (1) the sub-project should have completed all the government approval procedures; (2) the budget is expected to be allocated to the sub-project in FY 2003 or FY 2004; (3) the sub-project shall be completed by the end of FY 2005 or FY 2006; (4) the sub-project cost shall not be more than 400 million rupees; and (5) land acquisition and other procedures for the sub-project should have been completed. In addition to these five criteria, the criterion "the sub-project shall target more impoverished areas" was also included.

In SIRUP I, nearly 3,500 SPs were conducted nationwide in accordance with local conditions. SPs were conducted mostly as planned excluding the community roads (Maganaguma)[7] were added later. Initially, it was agreed that part of the "NGO cooperation fund" would be provided to NGOs with the aim of contributing to poverty reduction by cooperating with NGOs and increasing the effects of the project. However, the Project Implementing Agency (PIA) for each sector of the project had no experience in cooperating with NGO activities, except for the CWSSP. Furthermore, the CWSSP required cooperation with communities, then it was determined that it would be more efficient and effective for the CWSSP to take charge of the NGO projects. Therefore, the NGO cooperation fund was integrated into the CWSSP[8].

In SIRUP II, over 9,000 SPs were conducted in accordance with local conditions. The soft component was also added in response to local needs, including: health education promotion where equipment for health education (such as television sets and DVD players) are distributed to the resource center in each area; standardization of biomedical equipment where a survey is conducted for medical institutions and a nationwide standard medical equipment list is created; and the implementation of the Management Information System (MIS) in provincial councils.

3.2.2 Project Input

3.2.2.1 Project Period[9]

While the planned project period for this project was 74 months, the actual project period was longer, at 95 months (28% longer than the planned period)[10].

Major reason for the project periods being longer than planned was the facts that each PIA was unfamiliar with conducting a large number of sector loan type small scale projects. Even though it is considered as external factor, delayed in procurement and construction due to the effect of the 2004 Tsunami was also explained as one of the reasons.

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[7] Maganaguma is a project to rehabilitate community roads stipulated in government policy. The project was implemented with the aim of improving access from very small-scale roads in rural areas to arterial roads, markets and social services.

[8] As a result, 53 NGOs utilized the fund to conduct training projects for capacity building and other projects. The total sum of money utilized was 22.5 million rupees and the Community Based Organizations (CBOs) which participated in the activities reached 166.

[9] The project period is defined as the period from the signing of the L/A to the completion of all the work included in the project.

[10] The planned project period for SIRUP I was 37 months from March 2003 to March 2006, but the actual project period was 46 months from March 2003 to December 2006 which is 124% of the planned project period. As for SIRUP II, the planned project period was 37 months from March 2004 to March 2007, but the actual project period was 49 months from March 2004 to March 2008, increasing by 32% from the planned project period. Therefore, the actual project period was longer than planned in both projects.

3.2.2.2 Project Cost

The project cost was lower than planned. While the planned project cost was 28,670 million yen, the actual project cost was 28,015 million yen, or 98% of the planned cost. For SIRUP I, while the planned project cost was 12,856 million yen (Japanese loan portion was 9,595 million yen), the actual project cost was 14,474 million yen (Japanese loan portion was 9,595 yen), or 113% of the planned cost. The main reasons for the increase in costs were reported as an increase in the number of SPs and a sudden rise in materials and labor costs after the tsunami occurred. For SIRUP II, while the planned project cost was 15,814 million yen (Japanese loan portion was 11,776 million yen), the actual project cost was 13,541 million yen (Japanese loan portion was 11,776 yen), or 86% of the planned cost. This is because each PIA covered the general administration cost and the number of SPs in the rural development sector was reduced. Planned and the actual cost of each component are as follows.

Table 2: Planned and Actual Cost of Each Component (Unit: million yen)

SIRUP I	Planed	Actual	SIRUP II	Planed	Actual
Water Supply	3,709	4,544	Education	3,452	4,477
Irrigation	416	716	Health	6,266	6,649
Road (RDA)	4,227	6,245	Rural Development	756	480
Road (Community)	-	1,100	Capacity Building	231	158
Education	362	425			

Source: Project Completion Report

Although the project cost was lower than planned, the project period was longer than planned. Therefore, the efficiency of the project is fair.

3.3 Effectiveness (Rating: a/)

3.3.1 Quantitative Effects

3.3.1.1 Results from Operation Indicators[11]

(1) Water Supply [Population who can Access to Safe Drinking Water]

It was known that about six million residents were not able to access safe drinking water before the project started[12] in the project areas. It is estimated that the project covered about 25% of the population with no access to safe drinking water identified at the time of

[11] Targets, etc. for the project were not set at the time of the appraisal because details of operation and effect indicators were to be set after the baseline survey and impact survey had been completed. Similarly, values for operation and effect indicators were not shown in the Project Completion Report (PCR). The project provides support for multiple sectors targeting the entire country and numerous small-scale projects were conducted under the project. Therefore, it was extremely difficult to obtain data on indicators for each target area and to measure the effects quantitatively. Therefore, when setting operation and effect indicators, national-level indicators were employed except for the indicators for the irrigation, road and rural development sectors, for which data on local target areas were available. The indicators mentioned in this report were selected because they were considered to be appropriate for measuring the effects of SIRUP, after consultations with each PIA.

[12] According to the documents for the appraisal, it was estimated that about 78% of the total population of the country live in rural areas, of which 35% (about six million people) had no access to safe drinking water.

the appraisal since the total number of beneficiaries from the NWSDB and the CWSSP was about 1.78 million people. The coverage of the population with access to safe drinking water out of the total population was 82% before the project and it increased to 84.7% when the project ended. Therefore, access to safe drinking water was slightly improved.

(2) Irrigation [The Cultivated Area and the Yield]

The changes in irrigated area and the rice yield per unit area were confirmed in the target area to assess the effectiveness of the project. The yield increased from 3 ton/ha before the project to 5 ton/ha after the project ended (a 67% increase). The target set in the Special Assistance for Project Implementation (SAPI) was a 40% increase in the yield per unit area. Therefore, the result exceeded the planned target. Although a target for the irrigated area was not set, the irrigated area was increased by about 20% when comparing the area before and after the project was implemented, according to an interview with the Irrigation Department.

(3) Roads [The Volume of Traffic in the Subject Areas] [Roughness Index]

Table 3 and Table 4 show the changes in traffic volume and the International Roughness Index (IRI)[13] in the project area before and after the project was implemented. The data was obtained from RDA which is the PIA for the relevant project activities.

Table 3: Average Daily Traffic Volume in the Target Areas

Traffic volume in the project areas	Original (Before project)	Actual (After project)	Comparison
Pitakotte-Talawatugoda	5,136	19,406	378%
Battaramulla-Pannipitiya	11,744	21,922	187%
Kotte-Bope	12,912	26,149	203%
Piliyandala-Maharagama	6,971	7,560	108%
Kelaniya-Mudungoda	6,679	8,187	123%
Colombo-Galle-Hambantota-Wellawaya	15,450	22,851	148%
Hakmana-Beliatte-Tangalle	2,404	4,788	199%

Source: RDA (Road Development Authority) data

In the SAPI, the annual rate of increase in traffic volume was targeted to exceed the GDP growth rate. However, a comparison of the annual rate of increase in traffic volume is difficult since is conducted varies depending on the subject area. Nonetheless, when comparing the available data on traffic volumes before and after the project, the traffic

[13] The International Roughness Index (IRI) is a general indicator to show the roughness of a road. It indicates the roughness of a certain area of road in the subject area. A smaller value indicates a flatter and improved road condition.

volumes before and after the project , the traffic volumes in the subject areas increased by a minimum of 108% and a maximum of 378%. Therefore, it was confirmed that the project succeeded in increasing the traffic volume significantly.

Table 4: International Roughness Index (IRI)

Subject area	Planned (2002)	Original (2007)
Pitakotte-Talawatugoda	5.44	3.63
Battaramulla-Pannipitiya	6.25	4.71
Kotte-Bope	6.74	3.37

Source: RDA data

Regarding the IRI which assesses the roughness of the road surface, the values increased significantly in the subject areas for which data was available, therefore it was confirmed that the project improved the IRI.

(4) Education [Number of Schools Supported by SIRUP] [G.C.E. (O/L) Exam]

Primary and secondary schools which received support for the rehabilitation of school buildings, the installation of toilets and the construction of laboratories totaled 16% of all primary and secondary schools in Central Province in SIRUP I. In SIRUP II, which targeted the entire country excluding Central Province, 34% of all primary and secondary schools in Sri Lanka received the support. Although the support was small-scale, this support led to improvements in the school environment and an increase in the students' motivation to study, which in turn led to the increase in the average level of the G.C.E. (O/L) examination results[14]. In fact, the percentage of students who passed the examination increased when comparing the figures before and after the project was implemented, as shown in Table 6.

Table 5: Number of Schools Supported by SIRUP

	Total	Supported School	Proportion
SIRUPI	1,479	234	16%
SIRUP II	8,311	2,861	34%

Source: SAPI and PCR

Table 6: Result of G.C.E. (O/L) Exam (%)

	Before project	After project
Percentage of students who passed the G.C.E. (O/L) exam	30.8	36.4
Percentage of schools equipped with minimum facilities	63.6	78.2

Source: Provided by the Ministry of Education

(5) Health [Number of Hospitals Supported by SIRUP] [Number of Patients]

About 40% of all hospitals in the country received support from the project including support for facility rehabilitation and the provision of equipment and materials. Although the level of achievement could not be measured

Table 7: Number of Supported Hospitals

	Total	Supported	Coverage
Number of hospitals	1,418	544	38%

Source: Project documents

[14] GCE is an abbreviation of General Certificate of Education (Ordinary Level).

because no target was set, the number of inpatients increased by around 24% when looking at the change in the number of patients before and after the project was implemented. The number of outpatients also slightly increased, by about 4%.

Table 8: Number of Patients (Unit: thousand)

Number of patients	Before project	After project
No. of inpatients	3,912	4,856
No. of outpatients	43,765	45,382

Source: Medical Statistics Unit, Ministry of Health & Nutrition

(6) Rural Development [Sales of HCBs]

Since the implementation of the project, sales at Handicrafts Board (HCB) outlets which sell folk handicrafts and sales at the Industrial Development Board (IDB) outlet which sells craftwork have been showing an increasing trend overall. The HCB and IDB outlets were constructed by the project. In particular, sales at the IDB outlet have steadily increased since their construction and reached a total of 26,859,000 rupees by 2009.

Table 9: Sales of HCB Outlets (Rp.mil.)

	2008	2009
Sales of HCB outlets	32	47

Source: HCB outlets (Thummulla, Katubedda, B.Mulla)

Table 10: Sales of the IDB Outlet (Unit: Rp. thousand)

	2007	2008	2009	Total
Sales of the IDB outlet	413	8,617	8,799	26,859

Source: IDB (Industrial Development Board, Katubedda)

(7) Contribution of SIRUP

The outcome described in indicators (1)-(6) (except for some of the indicators) is thought to be a result of other support and factors in combination with SIRUP support, rather than a result of SIRUP support alone. Therefore, the level of SIRUP's contribution was confirmed by calculating the percentage of SIRUP expenditure out of the total public investment by each PIA during the project period. It can be considered that the percentage of SIRUP expenditure shown in Table 10 indicates SIRUP's contribution to the national-level outcome, in a financial sense. For example, about 10% of the budget for the water supply sector during the project period was provided by SIRUP. Therefore, it can be said that SIRUP contributed to 10% of the increase in the population who have access to safe drinking water when comparing the figures before (82%) and after (85%) the project. In the health sector, the number of patients treated at medical institutions nationwide increased by 24% when comparing before and after the implementation of SIRUP II. It can be considered that about 20% of the increase is due to the support of SIRUP.

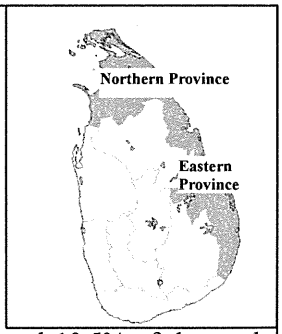
Table 11: The Percentage of SIRUP Investment out of the Total Investment in Each Sector

PIA, Sector	Investment amount / Year (Rp. mil.)		Proportion (A/B) %
	A = SIRUP	B = PIA Overall	
SIRUP I			
Water supply	3,424	34,567	10%
Irrigation	716	7,838	9%
Roads (RDA)	8,391	19,551	43%
Roads (Community roads)	1,000	1,000	100%
Education	425	About 12,200	4%
SIRUP II			
Education	4,477	About 34,800	13%
Health	6,649	33,600	20%
Rural development	980	About 3,000	About 30%

Source: Water supply: SAPI-related materials, CWSSP and NWSDB.
Irrigation, roads, rural development, education and health: relevant PIAs.

Note: Figures for the total investment amounts for the education and health sectors were not available because the funds were distributed to provincial governments and vocational training schools in addition to the Ministry of Health & Nutrition and the Ministry of Education. Therefore, the table only includes the education budget of Central Province for "Education" in SIRUP I, and the budget controlled by the Ministry of Education for "Education" in SIRUP II. Similarly, for the health sector, only the budget controlled by the Ministry of Health & Nutrition was included.

[Box 1: Support for the Northern and Eastern Provinces]



The project supported the entire country, including the northern and eastern provinces (the government-controlled area and the LTTE-controlled area) that were experiencing civil conflict. At the time, it was difficult for Japan to provide support in many cases for these areas because of the conflict. However, it was expected that SIRUP could contribute to poverty reduction in the regions by rebuilding schools and medical facilities destroyed in the conflict, using the project's framework where PIAs implement the project.

Combining SIRUP I and SIRUP II, 10.5% of the total number of projects and 10.5% of the total budget was allocated to the northern and eastern provinces (except for some sectors). In the interviews with the Project Director (PD) and PIA personnel in charge of the project at the time, it was revealed that many problems specific to the northern and eastern provinces arose at the project implementation stage: transporting goods took more time because roads for transport were not well developed; there were rigorous traffic checks by the LTTE and unexpected tolls were charged in some cases; and it was extremely difficult to secure appropriate contractors. Nonetheless, the project provided the same level of support in the northern and eastern provinces as it did in other areas, through patiently working on the activities and taking more time than usual. From this experience, it is thought that the active involvement of project personnel and implementing agencies is essential when providing support to areas where it is difficult for donor assistance to reach or where there is an ongoing conflict. It may be also effective to take a longer project period than usual for similar cases, in order to respond to unforeseeable problems.

Although the project effects in the northern and eastern provinces cannot be measured quantitatively because there is no relevant data available, it is significant that SIRUP was successfully implemented in these regions overcoming the problems mentioned above.

3.3.1.2 Results of Calculations of Internal Rates of Return (IRR)

In the project, the internal rate of return (IRR) was not calculated at the appraisal stage nor at the PCR stage, therefore planned and actual values cannot be compared. In addition, calculation of the IRR is not a suitable method since the project covers multiple sectors. Therefore, the IRR was not estimated in the evaluation of the project.

3.3.2 Qualitative Effects

In order to assess the qualitative effects of the project, a beneficiary survey and an interview survey were conducted for each sector and changes in the beneficiaries' living conditions, etc. were studied. Beneficiaries in each sector were subject to the surveys and a total of 150 beneficiaries responded in Central Province, North Western Province, Western Province and North Central Province[15]. The following explains the qualitative effects confirmed in each sector.

(1) Water Supply

After the project ended, it was confirmed that the quality and the quantity of water were improved due to the installation and repair of water supply systems. The beneficiary survey results showed that about 90% of respondents answered that both the quality and quantity of water improved.

[Question]	Yes	No	N/A
Has the water quality improved?	97%	3%	-
Has a sufficient amount of water become available?	89%	8%	3%

(2) Irrigation

In the beneficiary survey, studies were made to confirm the changes in the yield of agricultural crops after the project, in comparison with the yield before the project implementation. According to the result of the beneficiary survey, about 75% of respondents answered that the yield increased. Although the levels of increase for cultivated land varied depending on the region, the respondents answered that the cultivated land area increased by 0.25-1 acres on average. At the same time, about 80% of respondents answered that the quality of the agricultural crops also improved. According to the respondents, the yield increased due to sufficient irrigation water available and this resulted in the income increase, which in turn enabled them to purchase fertilizers, farming tools, etc.

(3) Roads

[15] The 150 people included the following number of respondents in each sector: water supply (39), roads (45), irrigation (19), education (21), health (18) and rural development (8).

Through the rehabilitation of arterial roads carried out by the RDA, 87% of respondents (local residents and users of roads in the subject areas) replied that the time required for getting to the main destinations such as markets had been reduced. It is difficult to measure the effects of the paving and repairs to community roads because they are very small-scale projects and each SP covers a few dozen meters of road. However, 91% of respondents answered that they had started using the roads more frequently.

[Question]		Yes	No	N/A
Has the time required for reaching markets and major access routes been reduced?	RDA	87%	13%	-
	Community	45%	55%	-
Has the number of time that you use the roads increased?	RDA	78%	17%	4%
	Community	91%	9%	-

(4) Education

The project included the rehabilitation of school buildings, the installation of toilets and the construction of laboratories. As a result, the number of schools which have the minimum equipment required and the number of schools equipped with a spare room have increased after the project, as shown below.

In interviews with school principals and the staff of the Ministry of Education, the schools became more attractive places for pupils and the environment for studying have improved as a result of the project, which led to an increase in the students' motivation to study.

[Question]		Yes	No
Does your school have the minimum equipment required?	Before	19%	81%
	Now	100%	0%
Does your school have a spare room?	Before	5%	95%
	Now	52%	48%
Did the number of students increase after the school buildings were improved or constructed?	-	67%	33%
Has student performance improved?	-	86%	14%

(5) Health

SIRUP II supported the rehabilitation of health and medical facilities, the procurement of equipment and materials, etc. As a result of a beneficiary survey for doctors, nurses and other staff in the supported hospitals, over 80% of the respondents answered that the number of patients treated and the number of operations increased. Those who considered that the hospital had been well equipped increased to about 90% after the project was implemented, although the figure was 0% before project implementation.

[Question]		Yes	No	N/A
Has the number of treatments and operations increased?		83%	17%	0%
Has the number of inpatients and outpatients increased?		83%	17%	0%
Does (Did) the hospital have a full set of equipment?	Before	0%	94%	6%
	Now	89%	11%	0%

(6) Rural Development

Construction of new sales stores and workplaces provided opportunities for residents to produce and sell craftwork

[Question]	Yes	No
Did sales increase after the project implementation?	84%	14%
Did the project contribute to increasing the production and sales of craftwork?	100%	0%

and ceramic work. This contributed to the promotion of motivation to produce craftwork and to the increase in sales.

As discussed above, this project has largely achieved its objectives, therefore its effectiveness is high.

3.4 Impact

3.4.1 Intended Impact

(1) Reduction of the Poverty Rate

The poverty rate in Sri Lanka has declined at the national level from about 23% at the time of the appraisal in 2002 to 15% in 2007[16]. SIRUP provided part of the financial support for the development of small-scale infrastructure which needed to be improved for poverty reduction (see the discussion about the percentage of investment in the "Effectiveness" section). Therefore, it can be considered that SIRUP, to a certain extent, contributed to poverty reduction.

It is difficult to measure the direct relationship between the development of small-scale infrastructure and the poverty rate. However, when looking at the relationship between the poverty rate and the indicators in the water supply sector and the education sector, areas with a higher proportion of households with access to safe drinking water have a lower poverty rate, as shown in Table 12 below. Similarly, areas where primary school students perform better (areas which have better conditions for students to study) tend to have a lower poverty rate. Therefore, it can be considered that the project had positive effects on poverty reduction because it provided support at the national level for sectors which are relevant to the poverty reduction.

Table 12: Relationship between the Poverty Rate and Each Sector

Area (Province)	Poverty rate (%)		Example: Water[Note 1]	Example: Average score of GCE (O/L)
	Planned (2002)	Actual (2007)		
Sri Lanka	**22.7**	**15.2**	**84.7%**	**43.0**
Western	12.3	9.0	94.4%	55.8
North Western	28.4	14.3	86.2%	45.3
Southern	28.5	15.7	85.0%	51.0
North Central	22.1	15.8	82.7%	34.0
Sabaragamuwa	33.5	23.8	72.9%	38.2
Central	25.7	25.2	72.1%	36.6
Uva	37.2	28.5	78.3%	39.9

Source: Department of Census & Statistics, "*Poverty Indicators, Household Income & Expenditure Information 2006/07*"

Note 1: The proportion of households that can access safe drinking water

[16] The poverty rate in 2007 is used because they are the latest figures officially published by the national government.

The project assisted in the construction and rehabilitation of small-scale infrastructure facilities nationwide. As mentioned above, the project was implemented with the aim of improving underdeveloped infrastructure which has been preventing poverty reduction, when Sri Lanka had serious fiscal problems. It is thought that this resulted in the project contributing to the reduction in the country's poverty rate, although to a limited extent.

At the time of the appraisal, it was pointed out that the poor had several characteristics: "many people engaged in agriculture," "relatively low education levels" and "a lack of basic infrastructure such as water supply." Therefore, solving the above-mentioned problems would contribute to poverty reduction. Thus, the project can be considered as having contributed to resolving these bottlenecks by developing social and economic small-scale infrastructure, as shown below.

- "Many people engaged in agriculture"
  The project contributed to improvements in the living standards of people engaged in agriculture (the increase in agricultural yields, the reduction of difficulties in transporting goods, etc.) by improving irrigation facilities and roads.
- "Relatively low education levels"
  The project contributed to the quality of education services and access to the services, by improving school facilities.
- "A lack of basic infrastructure such as water supply"
  The project improved access to safe drinking water by improving water supply systems. It also improved traffic access to basic services (health, education and markets) by improving roads.

(2) Results of the Beneficiary Survey[17]

[Water Supply]

[Water Supply] Question		Yes	No
Has the occurrence of waterborne diseases been reduced?	NWSDB	89%	11%
	CWSSP	80%	10%
Has the time required for fetching water been reduced?	NWSDB	89%	11%
	CWSSP	75%	25%
Have residents started actively getting involved in maintenance activities?	CWSSP	95%	5%

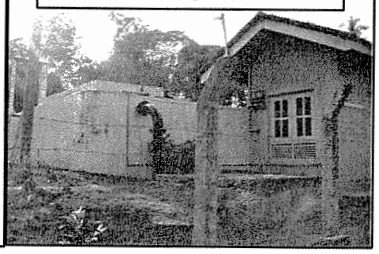
In the beneficiary survey, respondents replied that some of the impacts of the project for improving water supply systems were a reduction in the occurrence of waterborne diseases and a reduction in the time required for fetching water. In the CWSSP where beneficiaries participated in the improvement work for water supply systems, the respondents answered that residents started actively getting involved in maintenance activities, due to their participation in the project.

[17] Boxes 2-8 introduce the changes that the implementation of SPs brought about in the relevant areas and for local residents, in each sector. The articles were produced based on the results of interviews conducted on the sites which were randomly selected from the list of SPs conducted in Central Province, North Western Province and Western Province.

Box 2: Example of the Improvement in Living Conditions through a Project to Construct Water Supply Systems

In Naramara village in Central Province, SIRUP supported the construction of two deep wells and one pump house. In the past, only 500 households benefited from the water supply systems. The number increased to 1,610 households after SIRUP was conducted. Fetching water was hard work for women and children because they needed to walk to a shallow well 2-3 km away every day. The time required for fetching water has now been reduced and the quality of water is improving.

Constructed pump house

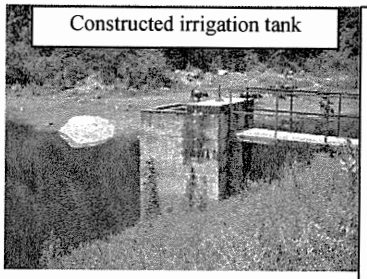


[Irrigation]

In the irrigation sector, the beneficiaries' income increased due to the increased irrigated land area and the increased agricultural yield per unit area. 100% of respondents answered that their household income had increased after the project was implemented. Some respondents observed that the improvement of the drainage facilities enabled the prevention of flooding in the rainy season and therefore it had become safer than before.

Box 3: Example of the Improvement in Living Conditions through Construction of Irrigation Facilities

Constructed irrigation tank



In Kiribamuna village in North Western Province, an irrigation tank and canals were constructed. The irrigation facilities supply water to the neighboring 50 acres of land and the residents are mainly cultivating paddy. In the past, they were farming using rain water and they could have only one farming season per year due to the shortage of water, and many pieces of land remained unused. Neighboring residents can now have two farming seasons per year and the yield per season in the area increased from 440-660 kg to about 880 kg.

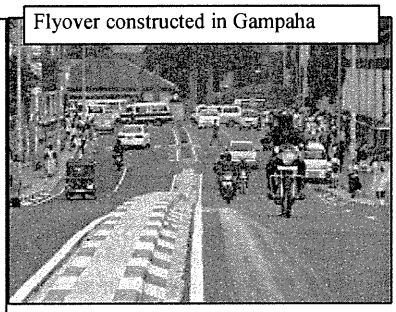
[Roads]

The reduced time required for transportation and the invigoration of local economies were confirmed as the impact of developing arterial and community roads. According to the results of the beneficiary survey, the time required for accessing public services such as the nearest market, school or medical facility has been reduced by 5-30 minutes in the case of the roads managed by the RDA and by 10-50 minutes in the case of community roads. Other impacts observed included increasing commercial activities in the areas around the roads, which led to increased incomes and rising land prices.

Box 4: Example of the Improvement in Living Conditions through the Construction of a Flyover

Gampaha District in Western Province, where industrialization is accelerating, has the highest population density in the country. A railroad connecting Kandy and Colombo goes through the district and 40 trains pass through the district each day. Therefore, congestion was a serious problem at the times when the trains passed through the district, especially in the morning and in the evening. This was a problem for areas neighboring the crossing. The flyover was constructed using SIRUP support in order to solve this traffic problem. In the past, people had to wait for more than 15 minutes at the gate, but this problem was solved.

Flyover constructed in Gampaha



Box 5: Example of the Improvement in Living Conditions through the Repair of a Bridge and the Improvement of a Rural Road Conducted by Magamaguma

Bus operating on the improved road

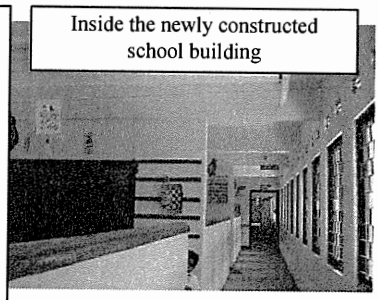
The bridge is situated on an access road to a arterial road which connects Egolamulla Gawalla village with the neighboring cities of Rideegama and Kurunegala. In the past, only three wheelers and motorcycles were able to use the road because the road was narrow and the bridge was weak. The bridge could not be crossed during the rainy season due to flooding. After the project implementation, a bus runs on the road four times a day thanks to the increased road width and the stronger bridge. Schools, hospitals, shops and markets are now easily accessible because there is a bus service whereas in the past people had no choice but to walk three kilometers to the Rideegama intersection which took about an hour and a half. It was also reported that farmers' incomes increased because shipping coconuts from coconut plantations near the road became easier.

[Education]

The project repaired parts of school buildings and installed toilets and laboratories. This resulted in a school environment where students could better concentrate on their studies. In the beneficiary survey, 100% of respondents replied that access to education services and the quality of the services improved after the project was implemented. It was also stated that parents became more cooperative in letting their children go to school because the school became a more attractive place. Other respondents said that teacher motivation increased thanks to the increased number of classrooms and the establishment of a teachers' office, etc.

Box 6: Example of Improvement in the School Environment

A two-story school building was constructed at Kadugànnawa primary school in Kandy District in Central Province, using SIRUP support. In the past, the school did not have enough classrooms and the teachers' office was also used as a classroom. After the project, the number of classrooms increased from 40 to 50. A meeting room for the parents association as well as rooms for other purposes were established. The school became popular thanks to the new building and it received 480 applications although the maximum number of students in each grade is 160. In the examinations for Grade 5, the number of students who gained high scores which enable them to enter a higher-level school increased from 12 to 44 when comparing the numbers for before and after project implementation.



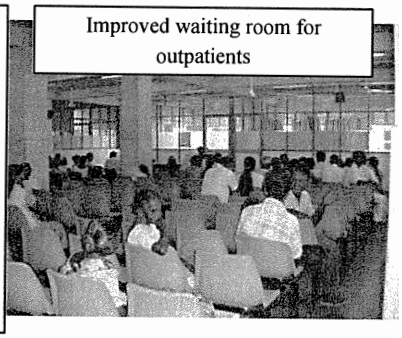
Inside the newly constructed school building

[Health]

A beneficiary survey was conducted at hospitals which received SIRUP support to renovate part of their facilities and received medical equipment. Almost all the respondents answered that access to health services and the quality of the services increased after the project was implemented. The reasons stated for the improvements included: the intensive care unit which was unavailable before the project; a waiting room was improved and all the patients can stay inside the building during their visit; more patients can be admitted thanks to the increased number of beds; and medical equipment and materials were replaced and this made it possible to provide appropriate and better treatment.

Box 7: Example of the Improvement in Health Services

The Kuliyapitiya Base Hospital in North Western Province received support for the improvement of part of its five-story building and the construction of a sewage treatment facility. In the past, the waiting room for outpatients would become full and patients had to wait outside the building because it was small, but now this problem has been solved. Patients can now avoid waiting outside the building. This is a major improvement because they do not need to suffer the high temperatures and strong sun during the day. Offensive smells were also a problem throughout the hospital before the project's implementation because of the lack of a sewage treatment facility, but this situation has been also improved.



Improved waiting room for outpatients

[Rural Development]

The construction of outlets and Common Service Centers led to an increase in the sales of folk handicrafts and increased incomes, according to the beneficiaries' interview survey. There was also a report that the establishment of a service center invigorated the town.

Box 8: Example of the Improvement in Community Activities through Rural Development

A Common Service Center was constructed in Molagoda village in Sabaragamuwa Province. The center can be used by members of local residents' associations. It is a kind of workplace equipped with machines to prepare the clay needed for pottery production and kilns to fire the pottery, etc. The Common Service Centers were provided with equipment and materials useful for pottery production. In the past, pottery workplaces only had traditional implements and it took two people two days to knead the clay used to make pottery, for example. The time required has been reduced to about 15 minutes due to the introduction of machinery. Preparing the clay using machinery enabled the production of clay of a consistent quality and this improved the quality of the pottery products.

A resident making pottery using clay prepared at the Common Service Center

3.4.2 Other Impacts

The scope of the project was to rehabilitate and upgrade small-scale infrastructure, which did not require an Initial Environmental Evaluation (IEE) and an Environmental Impact Assessment (EIA) according to Sri Lankan regulations. It was expected that the project would not have any particular impact on the environment. The project did not accompany resettlement of residents and land acquisition except for the irrigation and rural development sector projects, and no problems were expected regarding the relevant items. In fact, no problems regarding the environment, land acquisition or resettlement of residents were identified according to the interview survey with each PIA. There were also no serious environmental impacts found during the visits to some of the project sites.

As discussed above, through the small-scale infrastructure rehabilitations and upgrading in multiple sectors (water supply, irrigation, roads, education, health and rural development), the project contributed to solving problems that the impoverished population faced through the following efforts: increasing agricultural yields and reducing the difficulties of transporting goods; improving the quality of education and health services and access to the services; and improving access to safe water and traffic access; among others. Therefore, it can be concluded that, to a certain extent, the project contributed to the positive impacts on poverty reduction in Sri Lanka.

3.5 Sustainability (Rating: b)

The Ministry of Finance and Planning conducted comprehensive coordination of the overall project. Under the Ministry of Finance and Planning, each PIA implemented the construction work for each project and the responsibility to maintain the constructed facilities was handed over to the PIA, a local community or a residents' organization.

3.5.1 Structural Aspects of Operation and Maintenance

As shown in Table 13 the operation and maintenance of each facility is currently conducted by a Community Based Organization (CBO) or the organization managing the facility. According to the interview with each PIA, no major problems have occurred so far and each facility is being appropriately managed.

Table 13: Organizations for the Operation and Maintenance of Each Facility

Sector	Organizations responsible for operation and maintenance
SIRUP I	
Water supply (NWSDB) (CWSSP)	CBO, partly NWSDB CBO, partly CWSSP
Irrigation	FO, partly Irrigation Dept.
Roads (RDA) (Community roads)	RDA Pradeshiya Saba[Note 1]
Education (Central Province)	Each school and the government of Central Province
SIRUP II	
Education	Each school, the Ministry of Education and the Ministry of Vocational & Technical Training
Health	Each facility managing organization, the Ministry of Health & Nutrition and the provincial government for some facilities
Rural development	Each facility managing organization, the Ministry of Rural Industries Development for some facilities

Note 1: An organization which corresponds to a local government

In the SAPI (conducted from April 2005 to February 2006), some baselines and targets were set and the MIS was introduced in preparation for the monitoring. According to the PD at the time, the guidelines for project management created in the SAPI and the MIS introduced in each implementing agency for the monitoring were supposed to be utilized effectively from the time they were introduced to the time when the project was completed. However, the PD pointed out that they were not fully utilized particularly in the establishment of a monitoring system, because the SAPI was conducted when SIRUP I was coming to an end. It was also reported that the MIS installed in the Project Monitoring Unit (PMU) was not utilized effectively due to the malfunctioning of the software after the SAPI team left the site.

3.5.2 Technical Aspects of Operation and Maintenance

Currently, the CBOs or the facility-managing organization is responsible for the operation and maintenance of each facility. They are supposed to ask for help from the relevant PIA when they face a problem which cannot be solved under their capacity. However, there are no reports so far that such a problem occurred. RDA is taking charge of the operation and maintenance of arterial roads and no problems have been observed in the staff's technical levels. On the other hand, the CWSSP where the CBOs are mainly conducting the maintenance has some concerns regarding the technical capacity of the CBOs. In the interview survey, the relevant personnel from the CWSSP and the Irrigation Department emphasized that training for communities that will be involved in the operation and maintenance should have been included in the construction and rehabilitation projects

because organizations such as CBOs do not have the background knowledge for maintenance work. In the education sector, the Ministry of Education does not have any engineers within the organization. Therefore, they contact a provincial engineering office and ask for help when they have a technical problem.

3.5.3 Financial Aspect of Operation and Maintenance

As stated above, the facility-managing organization or CBOs is responsible for the operation and maintenance of facilities after the project has been completed. They also need to cover the costs for operation and maintenance. In addition, the relevant PIA is supposed to provide support when there is the need for large-scale maintenance which cannot be covered by the CBOs or the facility-managing organization. Therefore, it is expected that the financial situation of each PIA has a considerable effect on the maintenance of facilities supported by the project. It was confirmed that most PIAs are facing a shortage in the maintenance cost budget, as shown in Table 14.

Table 14: Financial Situation of Each PIA for Operation and Maintenance

PIA (the sector name)	Financial situation	Average annual O&M budget: ( ) indicates expected amount of budget shortage.
SIRUP I		(Unit: million rupees)
Water supply (CWSSP)	There are no reports of budget problems from the CBOs in charge of maintenance.	Depending on CBOs (N/A)
Water supply (NWSBD)	Although the budget is not sufficient, they manage to conduct maintenance within their income.	367 million rupees (N/A)
Irrigation	The O&M budget is insufficient. It is estimated that a budget twice the current size is needed for the required maintenance.	300 million rupees (About 300 million rupees)
Roads (RDA)	The O&M budget is insufficient. The annual maintenance budget is usually used up by around July. Therefore, it is estimated that a budget twice the current size is needed for maintenance.	4,430 million rupees (About 4,000 million rupees)
Roads (community roads)	Although the O&M budget is not sufficient, they conduct maintenance within the limited amount.	40 million rupees (N/A)
Education (Central Province)	The O&M budget is insufficient. It is estimated that a maintenance budget five times the current size is needed. Currently, the minimum maintenance necessary is not being conducted.	55 million rupees (About 200-250 million rupees)
SIRUP II		
Education	The O&M budget is insufficient. The estimated necessary amount for 2010 was 3,700 million rupees, but the allocated budget was 636 million rupees.	666 million rupees (About 3,000 million rupees)
Health	The O&M budget is insufficient. For example, an annual budget of about 300 million rupees is allocated for the maintenance costs for medical equipment, but the necessary budget is 800 million rupees according to the Ministry of Health & Nutrition.	2,200 million rupees (About 500 million rupees)
Rural development	The O&M budget is insufficient. A budget of 13 million rupees was requested as the necessary maintenance cost for 2010, but the approved budget was only 2.0 million rupees.	2.3 million rupees (About 11 million rupees)

Source: Based on the results of the interview survey for each PIA and materials provided by each PIA.

3.5.4 Current Status of Operation and Maintenance

There have been no serious problems raised concerning operation and maintenance because most facilities have only recently been completed and at some facilities the rehabilitation and construction work is still continuing or being expanded using Sri Lankan funds. In fact, no major problems concerning maintenance were observed during the site visits at facilities which received the project's support.

A concern for the future is the securing of maintenance budgets in most PIAs. All the infrastructure facilities supported by the project were small scale and many of them are being maintained by the CBOs or the facility-managing organization. They are also responsible for covering the maintenance costs in many cases; however, PIAs need to provide support when large costs occur which cannot be paid by them. In such cases, PIAs are currently finding it difficult to secure the appropriate budget for the maintenance of small-scale infrastructure.

As discussed above, some problems have been observed in terms of project maintenance: therefore, sustainability of the project is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The efficiency of the project is evaluated as fair because the actual project period was longer than planned. Regarding sustainability, there are some concerns about individual PIAs securing a budget. However, certain effects were observed in each sector that received support from the project and improvements in the residents' living conditions were confirmed.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

(1) The project is composed of the construction and rehabilitation of small-scale infrastructure facilities. Operation and maintenance of each facility is, except for some sectors, conducted by the organization managing the facility or by the CBOs. However, if they are not able to maintain the facility due to lack of capacity, the PIAs must provide them with technical and financial support. However, the PIAs are currently reporting financial shortages regarding the maintenance of infrastructure facilities in their sectors. Therefore, the Ministry of Finance and Planning, which served as the Executing Agency and coordinator of the project, will have to secure the budget needed to maintain the facilities. It will be difficult to separate the facilities supported by the project from other facilities when securing the budget. Therefore, it is

realistic to consider securing the budget as an integrated part of the operation and maintenance budget for the infrastructure facilities in each sector.

(2) The monitoring system was not fully functioned at the start of the project or during the project implementation. This is one of the reasons why the effects and the current status of the project are not being monitored. Although it is unrealistic to monitor all of the numerous small-scale SPs, it will be necessary to consider a realistic monitoring method by integrating it into the monitoring activities that are regularly conducted in each sector. For example, indicators which are highly relevant to the project's effects can be added to the indicators that the PIAs collect data on regularly. Another possible way would be to select indicators which are highly relevant to the project's effects from the indicators that the PIAs currently collect data on, and keep records on the selected indicators.

4.3 Lessons Learned

(1) Appropriateness of the project: The project is a multi-sector loan project. When compared to a typical project where the scope of the project has been determined by the time of the launch of the project, SIRUP is characterized by the fact that the SPs were selected more flexibly and the beneficiaries' needs were reflected more easily. The method used in SIRUP is suitable for a project where many small-scale SPs are subject to support, flexibility is needed to meet the needs, and the beneficiaries need to take charge of the operation and maintenance after the project is completed. When there is a concern about the capacity of the implementing agencies and CBOs that will be responsible for maintenance after the project is completed, it is desirable to include support for their capacity building.

(2) The need for a baseline survey and the setting of targets at the planning stage: No baseline survey was conducted at the time the project started, and targets were also not set. Under this situation, some of the PIAs had problems understanding the direction and the timeline of the project. In a flexible project such as SIRUP, it is difficult to set a baseline or a target at the appraisal stage. However, it is desirable to conduct a baseline survey and set measurable targets at least by the time the construction work starts in the SPs. When the project is a multi-sector project which contains numerous small-scale and decentralized SPs, it is necessary to devise approaches, such as selecting representative samples from the SPs based on the SP's area and size and the utilization of major indicators that are monitored at the national level.

(3) The need to establish an implementation and monitoring structure: As is the case for SIRUP, which targets the entire country and conducts numerous SPs in multiple sectors, the project requires solid organizational structures for implementation, project management and monitoring. In SIRUP, the Project Monitoring Unit (PMU) was established in the Ministry of Finance and Planning and the PIAs implemented the SPs. However, the staff exclusively working for the PMU only included one PD, one operator and one accountant, and they managed the whole project. This led to situations where the office work was partially delayed at the start of the project and the monitoring work could not be fully handled. When a similar project is to be conducted in the future, it will be necessary to establish an organizational structure which can ensure seamless project implementation and monitoring by deploying an appropriate number of personnel at the start of the project, such as allocating dedicated staff to each local area.

(4) Flexibility concerning procurement: SPs under SIRUP had to be implemented by following the specified procurement procedures which were decided by the Sri Lankan government. Therefore, some of the PIAs were puzzled by unfamiliar procedures which were different from the regular procedures and this led to an increased amount of work and delayed project implementation although to a small extent, in some cases. However, due to the nature of the project, it is important for the entire project to follow specified procedures in order to ensure its transparency and integrity. Therefore, when conducting a similar project in the future, it is desirable to carefully consider the advantages and disadvantages of a procurement system and a more flexible procurement system. Then, appropriate procurement procedures should be adopted depending on the characteristics and the content of the sectors, in order to ensure the efficient use of procedures suitable for each PIA's procurement methods.

Comparison of the Original and Actual Scope of the Project (Number of SPs)

Item	Original	Actual
(1) Project Output SIRUP I	Total number of SPs: 564	Total number of SPs: 3,470
	1) Water Supply 250	1) 240 (NWSDB:71, CWSSP:169)
	2) Irrigation 29 projects	2) 25
	3) Roads 68 projects (National Roads 1,530 km) (National Bridges 35)	3)-a Roads 180 (National Roads 1,093 km) (National bridges 30)
		3)-b Community Roads 2,765 (Community Roads 1,478 km)
	4) Education facilities 237	4) Education facilities 260
SIRUP II	Total number of SPs: 2,985	Total number of SPs 9,712
	1) Education Facilities 2,574	1) Education Facilities 6,446
	2) Health Facilities & Procurement 397	2) Health Facilities & Procurement 3,258
	3) Rural Development: 14	3) Rural Development:8
		4) Soft Component: Health Education Promotion, Standardization of biomedical equipment, Implementation of MIS
(2) Project Period SIRUP I	From January, 2003 to March, 2006 (39 month)	From January, 2003 to December, 2006 (47 months)
SIRUP II	From January, 2004 to March, 2007 (39 months)	From January, 2004 to March, 2008 (51 months)
(3) Project Cost		
Amount paid in Foreign currency	SIRUP I 1,926 million yen	SIRUP I -
Amount paid in Local currency	10,930 million yen (8,473 million Rp.)	14,474 million yen (16,639 million Rp.)
Total	12,856 million yen	14,474 million yen
Japanese ODA loan portion	9,595 million yen	9,495 million yen
Exchange rate	1Rp = 1.29 yen (As of Nov, 2002)	1Rp = 0.87 yen (Average in the Period from 2004 through 2008)
Amount paid in Foreign currency	SIRUP II 1,767 million yen	SIRUP II -
Amount paid in Local currency	14,047 million yen (11,420 million Rp.)	13,541 million yen (15,046 million Rp.)
Total	15,814 million yen	13,541 million yen
Japanese ODA loan portion	11,776 million yen	11,776 million yen
Exchange rate	1Rp. = 1.23 yen (As of Oct, 2003)	1Rp. = 0.90 yen (Average in the Period from 2004 through 2008)

Sri Lanka

Ex-Post Evaluation of Japanese ODA Loan Project
"Road Network Improvement Project"

Keisuke Nishikawa
Ernst & Young Advisory Co., Ltd.

1. Project Description

Project Location

Widened Road (Route AA005)

1.1 Background

In Sri Lanka, the transportation sector, with a contribution of 10% to the GDP in the late 1990s, played an important role as part of the economic and social infrastructure. The country had a 20,000-km road network, representing a rather higher road density to the land area than in the rest of South Asia.

On the other hand, most of the roads were constructed before Sri Lanka's independence in 1948, which has resulted in poor road alignments becoming a hindrance to the smooth traffic. As many of the roads also had unpaved shoulders, and/or lanes that failed to satisfy the width specified in the current design criteria, pedestrians and slower cars were preventing other cars from running at high speed. Moreover, the volume of traffic far exceeded the volume expected when they were originally designed. Nonetheless, a limited national budget has made it difficult to make sufficient investment in maintenance and rehabilitation of the roads, which, with a rapidly growing traffic volume, resulted in a vicious cycle of road deterioration. This situation led to the increase in time and costs for logistics and users and also to the hindrance of farming and manufacturing growth.

This project, designed to improve and rehabilitate the decrepit major road networks in the country, was therefore regarded critical for promoting its economic activities, and was put

into implementation.

This project was a project co-financed with the Asian Development Bank (ADB), and JICA financed two routes among the 17 planned routes that had been surveyed by ADB.

1.2 Project Outline

The objective of this project is to secure smooth traffic on the road network by improving and rehabilitating the decrepit road network in the Central Province of Sri Lanka, , thereby contributing to the vitalization of economic activities in the country.

Approved Amount / Disbursed Amount	3,078 million yen / 3,075 million yen
Exchange of Notes Date / Loan Agreement Signing Date	July, 1999 / August, 1999\
Terms and Conditions	Interest Rate: 1.8% Repayment Period: 30 years (Grace Period: 10 years) (Consultant Portion - Interest Rate: 0.75%, Repayment Period: 40 years (Grace Period: 10 years)) Conditions for Procurement: General Untied (Consultant Portion: Bilateral Tied)
Borrower / Executing Agency	Democratic Socialist Republic of Sri Lanka / Road Development Authority
Final Disbursement Date	July, 2007
Main Contractor (Over 1 billion yen)	China Harbour Engineering Company (People's Republic of China)
Main Consultant (Over 100 million yen)	Pacific Consultants International
Related Projects	Feasibility Study by ADB (1997)

2. Outline of the Evaluation Study

2.1 External Evaluator

Keisuke Nishikawa, Ernst & Young Advisory Co., Ltd.

2.2 Duration of Evaluation Study

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

Duration of the Study: December, 2009 – November 2010

Duration of the Field Study: March 3 – 16, 2010 and June 2 – 10, 2010

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

3.1 Relevance (Rating: a)

3.1.1 Relevance with the Development Policy of Sri Lanka

At the time of the project appraisal, Sri Lanka had set out its National Road Policy. It was a road policy prepared based on the Transport Sector Strategy Study, which emphasized the importance of road networks for the development of its economy. It defined the objectives of road network improvement specifically as:

- To promote economic development activities;
- To realize shorter travel time in a way that also takes account of safety;
- To make adequate arrangements to accommodate the current and future volume of domestic passenger and freight traffic; and
- To introduce effective and innovative methods of road design, construction, and operation and maintenance.

In the Five Year Development Plan (1997-2001), an importance was placed on the road sector, which was represented by the fact that half of the investment allocated to the transport sector was secured for road improvements.

The current development plan, Mahinda Chintana (2006-2016), states the necessity for sustaining economic development in a well-balanced manner across regions, to provide people all around the country with access to transport and to develop high-quality road networks conducive to passenger and freight transport. The National Road Master Plan (2007-2017), formulated in 2007, pointed out the widening of national roads as one of the priorities, by recognizing the importance of developing road networks to link economic growth centers around the country for future economic development. The national budget also reflects the recent recognition of the importance of the road sector. Between 2003 and 2008, the budget allocated to the road sector increased at an annual rate of 36%.

As described above, the development plans formulated after the project appraisal consistently put forward the importance of road improvements for economic and social development, with steady appropriations made for road improvements to support this important task. In terms of the policy measures, the enhancement of arterial national roads has been consistently emphasized as an objective since the pre-project period. This project conforms to the National Road Master Plan, which emphasizes the improvement of road networks between economic centers and the widening of national roads.

3.1.2 Relevance with the Development Needs of Sri Lanka

Since its independence, maintenance and repair of the roads have not been adequate in Sri Lanka, becoming a hindrance to the smooth traffic flows. As a result of the decline in investment for road improvements since the 1980s, many routes were left in poor conditions, and more than half of the roads needed rehabilitating. In particular, many of the arterial roads connecting provincial cities were forced to handle the large traffic volume beyond their capacities due to insufficient investments to accommodate the increased traffic volume brought about by economic development. In addition, the road surface was often damaged by overloaded vehicles and the reduction in effective road width due to many stores and other buildings encroaching into the road. Both of these factors reduced the capacity of the roads. Moreover, narrow roads were thronged with vehicles of different modes of transport (some at low speed and others at high speed), which significantly lowered traffic speeds on the road system as a whole. Thus, road transport had issues especially in terms of economic development and safety.

Road traffic, a mode of transport that still accounts for 90% or more of the entire transport in the country, has a critical role to play for national development. In order to handle the continuing growth in traffic volume, demonstrated by the increase in the number of registered automobiles from 1.78 million in 2001 to 3.39 million in 2008, the improvement and maintenance of the road network has become all the more important.

3.1.3 Relevance with Japan's ODA Policy

At the time of project appraisal, Japan had a basic recognition that Sri Lanka's road sector, which handled approximately 90% of the total transport demand, was an important mode of transport, and declared that "in terms of road improvement, Japan has a policy of providing assistance to the projects with higher priorities, with sufficient consideration given to the alleviation of traffic congestion in cities and the development of transport systems between them." This project, therefore, was relevant with Japan's ODA policy that stipulated the need for support to road improvements including the development of transport systems between cities.

This project was a large-scale project planned on the basis of the feasibility study conducted by ADB, and a part of the project was carried out as a co-financed project with the Bank. This is a feature relevant with Japan's assistance policy, and the implementation of this co-financed project is highly significant in light of such policy.

This project has been highly relevant with the country's development plan, development needs, as well as Japan's ODA policy; therefore its relevance is high.

3.2 Efficiency (Rating: b)

3.2.1 Project Outputs

In this project, a co-financed project between JICA and ADB, 17 routes among Class A and Class B national roads were improved and/or rehabilitated, and consulting services were provided. Among the 17 routes, JICA was in charge of civil engineering works and related consulting services (construction oversight, support for tendering, etc.) for Route AA005 and Route AB013. A comparison between the actual outputs and the original plan at the time of the appraisal is shown in Table 1 below.

Table 1: Comparison of Original and Actual Outputs (Components financed by JICA)

Item	Original	Actual
Civil Engineering Work	a. Improvement of geometric alignment of Route Class A and B (by ensuring the road design standard of Road Development Authority (RDA)) and pavement strengthening [Option 1 work (provision of 7.4 m carriageway and 1.8 m paved shoulders)] - Approximately 20 km on Route AA005 (Gampola – Pussellawa) - Approximately 20 km on Route AB013 (Gampola – Nawalapitiya)	All the components in a., b., and c. in the original scope were implemented and the following components were added as a result of the design review. - 10 bridges, not to be widened in the original design, were widened to 2-lane standards - Shoulders were paved with asphalt concrete which were proposed to do with SBST/DBST - A concrete-lined vehicle tunnel, 220 m long, 6.0-7.2 m wide with 4.2 m clearance was constructed - A utility corridor of minimum 0.5 m width was provided for future improvements - A weighbridge was installed in Gampola to prevent overloading - Built-up drains were provided on one side of the road to facilitate drainage
	b. Pavement Strengthening of Route Class A and B [Option 2 work (provision of 6.0 m carriageway and 1.2 m paved shoulders)] - Approximately 40 km on Route AA005 (Pussellawa – Nuwara Eliya)	
	c. Rehabilitation and widening of bridges - Route AA005 (No. of bridges: 2) - Route AB013 (No. of bridges: 3)	
Consulting Services	a. Pre-contract assistance b. Construction supervision c. Assistance to RDA in Operation and Maintenance d. Environmental Protection Planning of environmental protection method during construction Environmental monitoring during construction Total of 544 MM	a. Pre-contract assistance, Pre-qualification assessment of contractors b. Design review c. Construction supervision d. Preparation of Operation & Maintenance manual e. Planning and supervision of environmental protection work Total of 772 MM

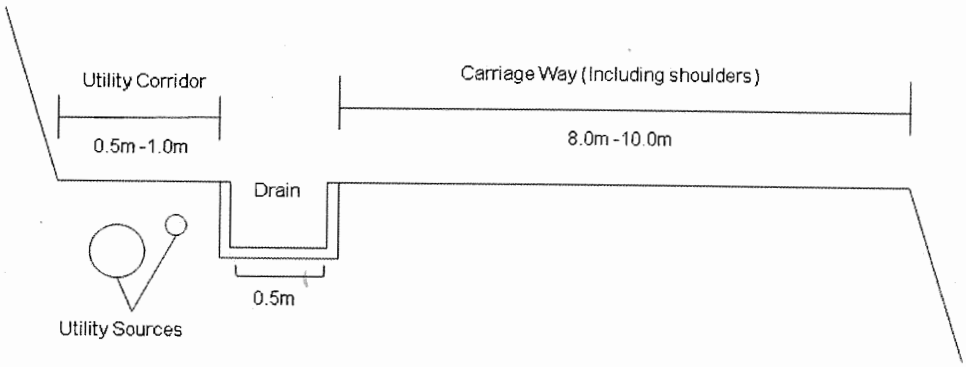


Figure 1: Cross Section of Road

The road sections included in this project were originally designed by ADB. After the loan agreement was signed, however, the Road Development Authority (RDA) and JICA reviewed the design, and added several sub-components to the original design. It was decided, as a result, to construct drains and utility corridors as wide as possible for wiring and piping purposes all along the sections. On-site surveys of the roads, including the test-runs on them, have suggested that the widened bridges and tunnels constructed on the sections were quite effective in enabling the smoother traffic flows.

During the construction work, measures were taken to ensure safety and durability of the roads by building safety walls, protecting the slopes, and adopting u-shaped gutters for drainage. However, during the construction period, there were several cases of collapses of slopes due to heavy rains. In November 2006, a large-scale landslide occurred in Paradeka, along the Route AA005, in which six onlookers were killed. A dispute over compensation between the victims' families and RDA is still pending in the court.

With regard to the consulting services, an additional review of the road design was conducted after the loan agreement was signed, since the bridges were not designed with sufficient widths in the plan prepared by ADB due to the shortage of project budget. Also, the workload of the consultants increased, as the assistance for the pre-qualification assessment of contractors and the care of roadside residents during the construction work were added to the original plan. As a result, the total person-months required increased by 42%, though the rise in personnel expenditures was limited to the increase of 13%.

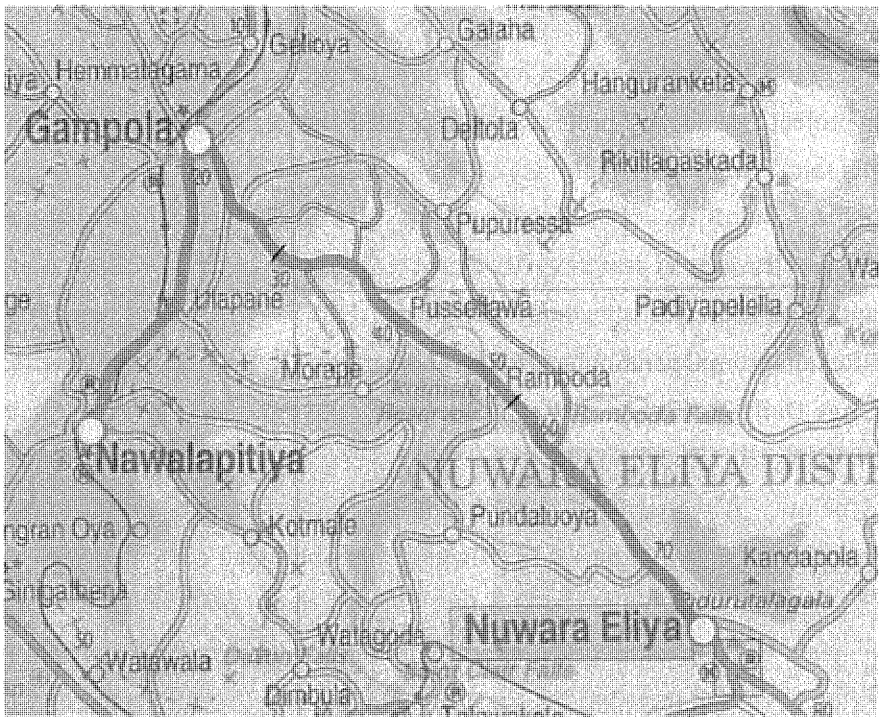


Figure 2: Regions and Roads Covered by the Project

3.2.2 Project Inputs

3.2.2.1 Project Period

According to the original plan, the project was to start in August 1999 and to be completed in March 2005 (in 68 months). Actually it started in August 1999 and was completed in March 2007 (in 92 months), 35% longer than the originally planned period. The delay was caused mainly by: (1) the difficulty in land acquisition; (2) a longer period of time spent to confirm the information to be used for pre-qualification assessment; (3) residents' protests against blasting at quarries and along roadsides; and (4) unusually unfavorable weather conditions. However, considering the project sub-components added after the design was reviewed, the substantive delay should be regarded much less than what it was.

3.2.2.2 Project Cost

The project cost, ¥4,009 million in the plan (of which ¥3,078 million was a yen loan), actually totaled ¥4,843 million (of which ¥3,075 million was a yen loan), resulting in a ratio of 121% to the plan (of which 99.9% was a yen loan), which was slightly higher than the planned amount. However, the excess was due mainly to the components added to the project after the design was reviewed. The additional component was fully financed by the Government of Sri Lanka under the agreement between RDA and JICA. Considering the alterations made to the design, the additional cost should be considered

reasonable.

Both project period and project cost exceeded the plan, therefore efficiency of the project is fair.

3.3 Effectiveness (Rating: a)

3.3.1 Quantitative Effects

3.3.1.1 Results from Operation and Effect Indicators

(1) Average Daily Traffic[1]

On the sections included in this project, the average daily traffic changed as shown in Table 2 below. Although it cannot be said that sufficient data on the traffic volume have been collected, the volume of traffic generally increased compared with the volume before the project was completed. This fact suggests that the improved roads have eased the movement of people and goods produced along them. In particular, on the arterial road of Route AA005, there has been a substantial increase in the number of vehicles.

Table 2: Average Daily Traffic

(Unit: No. of vehicles)

	1995	2003	2007 (Completed)	2009
Route AA005 (Origin: Gampola)				
14 km point	1,620	2,431	3,239	
28 km point		1,656	2,495	3,357
Route AB013 (Origin: Gampola)				
3 km point		5,055	6,807	5,877
11 km point			2,920	

Source: RDA

(2) Increase in Average Speed of Vehicles, and Reduction in Travel Time

As RDA does not collect data on the average speed of vehicles or the travel time required, a beneficiary survey[2] was conducted in the ex-post evaluation to measure the level of improvement in regard to these indicators.

The average speeds of vehicles going along the sections have changed significantly after the project, from 21.1 km/hour to 36.6 km/hour on Route AA005, and from 18.4 km/hour to 32.3 km/hour on Route AB013, which are the increases by 73% and 76%, respectively. The survey also showed that 76% of the residents who responded to the

[1] Average volume of traffic during the period of the seven-day survey (168 hours)

[2] The beneficiary survey on this project is based on interviews with a total of 122 respondents (62 along Route AA005 and 60 along Route AB013), which included people living along the road sections in this project, owners of stores, and bus drivers.

survey felt that the traffic had become smoother after the completion of the project. This is a finding demonstrating that the roads have been improved in terms of the level of ease for travelling vehicles.

Along with the increase in the average speed of vehicles, the time required for travelling between places was largely shortened, down 61% on Route AA005 and 57% on Route AB013, which suggests considerable effectiveness in reducing travel time. In the beneficiary survey, 94% of the respondents commented that access between places had "considerably improved" or "slightly improved," showing the effectiveness in shortening the travel time felt by the road users.

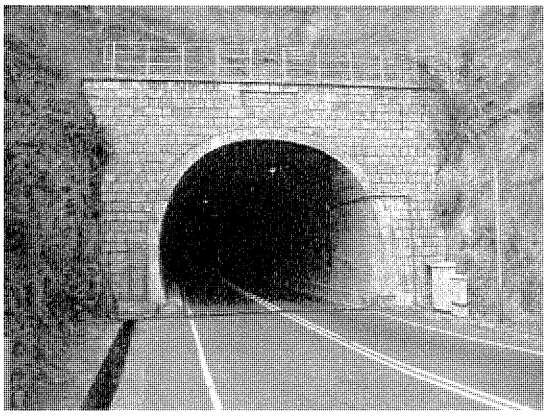


Photo 1: The Only Tunnel on National Highways in the Country (Constructed in This Project)

Photo 2: Improved Road Alignment (Route AA005)

3.3.1.2 Results of Calculations of the Internal Rates of Return (IRR)

Economic Internal Rate of Return (EIRR)

When this project was appraised, the figures calculated by ADB, which was the coordinating organization of the entire project, were used as the estimated EIRRs for planning. Since 2006, RDA has employed HDM4, a computer program developed by the World Bank for measuring the effects of road construction projects, and the software was used to calculate the actual EIRRs.

Table 3 EIRRs of the Project

(Unit: %)

	Original	Actual
Route AA005	21.4	16.6
Route AB013	19.2	42.9

Note: Cost is assumed as the project costs and operation & maintenance expenses.
Benefit is assumed as time & traveling benefits, and reductions in transporting expenses.

Source: Project Appraisal Report, and the data provided by RDA

While the caution is needed in simply comparing the actual EIRR with the planned figures as the EIRR calculated by HDM4 is based on a lot more data, the actual EIRR fell below the planned figure on Route AA005. On the other hand, the actual value significantly exceeded the planned one on Route AB013. The actual EIRR was less

than the planned figure on Route AA005 mainly because the construction costs exceeded the original estimates as a result of the changes in the road design. On Route AB013, on the other hand, EIRR became much higher than the original forecast due to the substantial improvement in ease of driving and to far greater road use with increased economic activities along the road.

3.3.2 Qualitative Effects

At the time of project appraisal, the following qualitative effects were pointed out:

(1) Efficient transportation achieved by a reduction in transportation costs; and
(2) Longer structural life of the roads

On the basis of the beneficiary survey and the site survey conducted in the ex-post evaluation, the extent to which the effects expected in the appraisal have been realized is examined below.

(1) Efficient Transportation Achieved by Reduction in Transportation Costs

According to the beneficiary survey, 57% of the respondents say that the cost for vehicle maintenance has substantially decreased and 34% of them refer to the slight decline, amounting to more than 90% of the total responses in the affirmative. How much the decline in vehicle maintenance costs contributed to the decrease in transport expenses and efficiency in transport was not measured quantitatively, but the enhanced ease of driving vehicles on the roads has improved the efficiency of transport and this was obvious in the interviews with the people living or doing business along the routes. It can easily be imagined that the shorter travel time and the decreased maintenance costs have stimulated transport activities. According to the survey report prepared by ADB, the project has achieved a 25-35% reduction in the driving costs as a whole.

(2) Longer Structural Life of the Roads

The roads improved in this project have a strong structure durable for 15 years after being brought into service only with the regular operation and maintenance work. In Sri Lanka, most roads are paved only on the carriageway, and the shoulders are usually left unpaved. This project is the first one to have firmly paved the shoulders in addition to the carriageways.

The index internationally used in assessing the flatness of road surfaces is called the International Roughness Index (IRI), where a smaller figure represents greater flatness. The indices have shown a significant improvement from around 10 to 3 or so, as shown below.

Table 4: Changes in International Roughness Index

Highway	Section	International Roughness Index	
		Before the Project	After the Project
AA005	Gampola – Paradeka	8.93	2.79
	Paradeka – Pussellawa	10.16	3.82
	Pussellawa – Ramboda	9.13	3.00
	Ramboda – Nuwara Eliya	9.54	3.24
AB013	Gampola – Ulapane	10.18	2.38
	Ulapane – Nawalapitiya	10.33	2.34

Source: RDA

This project has largely achieved its objectives; therefore its effectiveness is high.

3.4 Impact

3.4.1 Intended Impacts

The impact intended at the time of appraisal was the promotion of economic activities supported by the improvements of the roads developed in this project.

In the ex-post evaluation, it was very difficult to obtain the macro data by district. Therefore, the beneficiary survey was conducted mainly to see whether the business income had increased and what had been recognized by the people living in the project area as the changes in economic activities, in order to examine whether and how the intended impacts have been achieved.

Table 5: Income of People from Doing Business along the Routes after the Project

Do you think that your (or business people's) income has increased after the Project?	Increased a lot	Increased	Same	Decreased	Decreased a lot	Other / No reply
	53%	21%	7%	3%	0%	15%

Note: Business people were asked about the actual increases in their income, while the residents were asked for their opinions about the changes in business people's income. Their responses were compiled in the table above.

Table 6: Changes in the Local Society and Economy after the Project

After the improvement of the road, have you experienced or seen any changes in the local society and economy?	Yes	No
	89%	11%

⇩ Major changes

Employment creation	Land value increase	More commercial activities
3%	58%	41%

As for the changes in incomes earned by the business people along the road, almost three quarters of the respondents answered that the incomes "Increased a lot" or "Increased". This is an indication that a lot of residents opined that the economic activities have become more vibrant after the road improvement. In fact, nearly 90% of the residents have felt some changes in the local society and economy. The on-site survey has also revealed that several new stores opened and a number of new commercial facilities had started businesses after the road improvement. RDA and the local police commented that Nuwara Eliya, a famous tourist town on Route AA005, have attracted a larger number of visitors after the road improvement, though no specific figures are available. As stated above, the roadside residents are feeling that the economic activities have become more active than before, which demonstrates that this project has made a certain level of contribution to the local development.

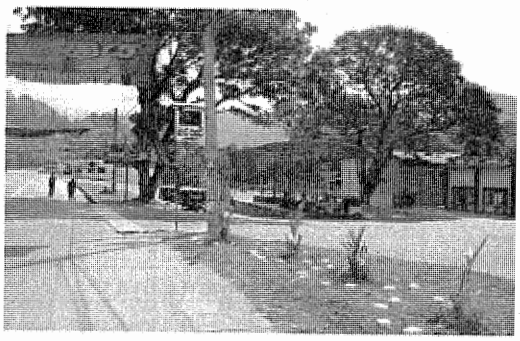


Photo 3: Bus Stop and Commercial Facilities Newly Established After the Project (along Route AB013)

3.4.2 Other Impacts

(1) Impacts on the Natural Environment

At the time of project planning, the Central Environmental Authority (CEA) stated that this project, which was to improve existing roads, could be carried out without any Initial Environmental Evaluation (IEE), but required instead that the attention be paid to the following points:

- Surface water should be effectively drained
- All excavated spoil material should be properly stored and disposed of
- All debris/excavated materials should be transported in covered vehicles
- The noise levels at the boundaries of the project site should be controlled
- Resettlement and compensation for damaged properties should be effected

Following these requirements, RDA states that it generally implemented the project by securing the disposal stations for the waste and soil to prevent the streams around the project sites from silting up. During the on-site survey, no cases were found where the negative environmental impact was suspected as a result of road construction. With regard to the noise levels around the quarry, since some of the neighboring residents made complaints during the project implementation, the construction work was carried out between 6 a.m. and 6 p.m. Thirty two families living adjacent to the quarry were asked to move and rent a house in other places for two years, and were offered a monthly

rent of 3,000 rupees as the compensation. Interviews with the residents around the former quarry have revealed that no major cases of complaints were made after the compensation negotiations were concluded and some of the residents even cooperated in the quarrying work.

(2) Land Acquisition and Resettlement

At the time of project planning, the land area to be acquired in the entire project was estimated to be 20 hectares. 12.25 hectares of land was actually acquired. It was also expected that 77 families would have to resettle, but it turned out to be only 17 families along the Route AA005 and 16 families along the Route AB013 (33 families in total). This is mainly because the retailers, especially in Pussellawa, a town along the Route AA005, continued their businesses in their original locations without relocating. Another major reason for the smaller land area acquired is that some of the sites that were believed to belong to the private owners and were expected to be used to widen the roads turned out to be the government land reserved for road construction.

In order to carry out this project, RDA laid down the high-level compensation criteria[3] , which included incentives provided for the people who would lose their land sections, houses and/or jobs in order to encourage them to move within a specific period of time. Interviews conducted during the on-site survey have suggested that although some of them wanted a larger amount of compensation, the majority were generally satisfied with the amount they received. Many of the retailers and other business owners who transferred some of the land they had along the routes spent the compensation to renovate their stores and stayed at their locations to continue their businesses, even though with a little smaller floor spaces. No specific cases of major complaints were found in the interview survey.

(3) Unintended Positive/Negative Impact

As another major impact of improvements to the roads, a higher level of comfort when driving on the roads with the expanded width, better-coordinated alignment, and smoother surfaces, seems to be highly welcomed by the people in the project area. According to the beneficiary survey, 97% of the respondents commented that the bus and other road transport services have improved, and the same percentage answered that driving has become more comfortable. In addition, 63% of them feel that the safety of the roads has generally improved. The survey has revealed that, as a result, 96% of the respondents are satisfied with the current state of the roads. On the other hand, some

[3] Later, RDA laid down "Ex-Gratia Package for the People Affected by Highway Projects," which sets out compensation standards applicable to any types of highway projects.

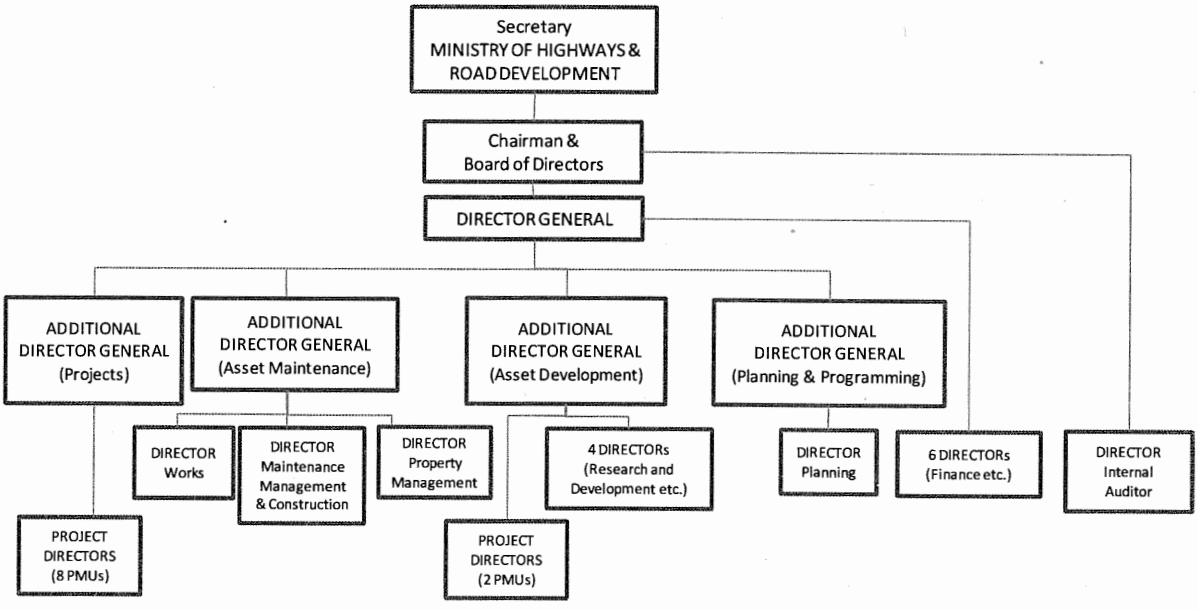
problems have been pointed out in the survey; the improved road alignment enables the vehicles to go faster, which have made some of the residents feeling it a little dangerous; and some roadside ditches are not functioning in the rainy season, leaving the roads flooded during heavy rains. Apart from such problems, however, this project has brought significant positive impacts to the people along the roads.

In conclusion, it can be said that this project was carried out with appropriate measures to deal with potential social and environmental problems. It has also stimulated greater economic activities as originally planned, and a much higher level of comfort on the roads has provided greater satisfaction to the people living in the project area.

3.5 Sustainability (Rating: b)

3.5.1 Structural Aspects of Operation and Maintenance

The operation and maintenance of national highways after the project is under the responsibility of RDA's Maintenance Management & Construction (MM&C). In practice, RDA's provincial offices are responsible for operation and maintenance activities in each province under the supervision of MM&C. This project is being supervised by the provincial offices in Kandy and Nuwara Eliya.



Source: RDA

Figure 3: Organization Chart of RDA (simplified version)

The offices in Kandy and Nuwara Eliya have 111 and 82 staff, respectively, working on the operation and maintenance of national highways. RDA feels that it has insufficient

manpower for the large geographical area it covers.

Table 7: Number of Staff for Operation & Maintenance (2009)
(Unit: Person)

	Kandy Area	Nuwara Eliya Area
Executive Engineer	1	1
Technical Staff	4 (2 Officers, 2 Assistants)	4 (2 Officers, 2 Assistants)
Gang Leader (Supervisor)	3	2
Maintenance Laborer	103	75
Total	**111**	**82**

Source: Results from the interviews with each RDA office

RDA has a view that it has a structure established for operation and maintenance, but has difficulties in increasing the number of maintenance staff due to the lack of financial resources. In particular, a shortage of laborers has become a cause for the troubles that often occur during the rainy season, when a lot of operation and maintenance work is required.

The operation and maintenance workers in each area are divided into several groups at a district level. The road sections included in this project, therefore, are maintained and managed by a smaller number of staff than the number shown in Table 7. Since the sections are still in good conditions as only a short period of time has passed since the completion of the project, a larger number of staff members have been assigned to the operation and maintenance of other routes.

3.5.2 Technical Aspects of Operation and Maintenance

RDA comments that it has sufficient technical skills for operation and maintenance and has no major problems in this respect. The actual operation and maintenance is carried out by the staff at RDA's provincial offices. The good conditions of the roads suggest that there are currently no problems in terms of technical aspects.

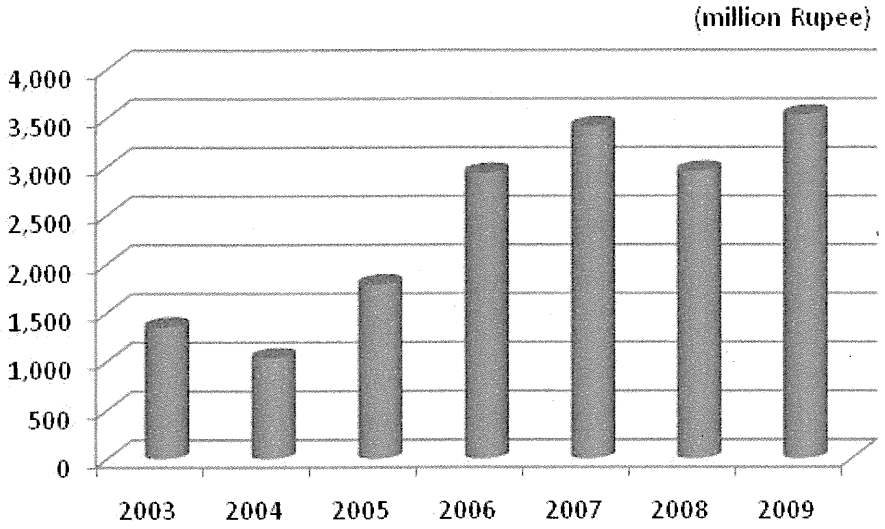
RDA trains its staff at a training center in Colombo. It offers a course on road maintenance. The technical staff members attend three training sessions running for several days every year, and some skilled workers have one training session each year to obtain a higher level of skills for their daily operation and maintenance work. Also, the maintenance staff often take part in the training programs offered by donor agencies and international organizations as well as the workshops held by external organizations such as universities and research institutions.

However, while the staff generally have a lot of opportunities for training, they sometimes seem unable to use their expertise to its fullest potential, partly due to the lack of equipment they need on the ground to apply the knowledge and skills they have learned.

3.5.3 Financial Aspects of Operation and Maintenance

RDA's budget allocated for operation and maintenance work has been growing on average with some fluctuations, at a rate higher than the inflation rate observed during the same period. However, while a number of road construction projects and large-scale rehabilitation projects are implemented, human and financial resources appropriated for operation and maintenance are insufficient compared to the demand for them. This situation applies not only at the national level but also at a local level (Kandy and Nuwara Eliya).

The lack of operation and maintenance of the roads has long been pointed out as a problem. To address this perennial problem, the Road Maintenance Trust Fund (RMTF) was established in December 2005 in order to secure sufficient budget for road operation and maintenance. Each liter of gasoline and diesel has a levy of 1 and 0.5 rupees respectively, which amounts to 1.5 billion rupees of tax money annually channeled into the RMTF. As a result, a substantial increase in the budget for operation and maintenance has been achieved since 2006. It is expected that the RMTF will continue to finance not all but at least a considerable part of the maintenance budget every year. However, at the time of the ex-post evaluation, RDA has not yet been authorized to directly use RMTF's money, as it is still under the control of the Ministry of Finance and Planning. RDA is now in discussions with the Ministry on how the fund should be managed. At present, RDA is provided with funds from the general budget, which includes the amount coming from the RMTF.



Source: RDA

Figure 4: Trend in the Road Operation and Maintenance Budget

Table 8: Operation & Maintenance Budget Allocated to Kandy and Nuwara Eliya Offices of RDA

(Unit: million Rupee)

	Kandy	Nuwara Eliya
2008	166.8	40.8
2009	427.1	104.7

Note: Total amount of major activities such as routine and periodic inspections

Source: RDA (Kandy and Nuwara Eliya Offices)

3.5.4 Current Status of Operation and Maintenance

The roads improved in this project have generally been kept in good conditions. The Ramboda Tunnel, the only tunnel on the national highway in Sri Lanka, is inspected by the RDA technical staff every week and is kept in good conditions. The road in this project was developed with durable structures both on the carriageways and shoulders, and this aspect should be highly evaluated under the shortage of operation and maintenance budget. In some districts, however, the shoulders or other parts of the roads are blocked due to the encroachers, or the surfaces have not been fully repaved after water pipes were laid down. Adequate measures should be taken so that the life of the roads will not be shortened. In addition to the financial difficulties described in the previous section, it seems that the following issues need to be attended to in the future operation and maintenance of the roads.

(1) Cleaning of Road Shoulders

It did not seem practical that RDA, without sufficient number of laborers for operation

and maintenance, would undertake all the maintenance works. For this reason, it is imperative to have voluntary cleaning activities by the roadside residents, but the reality is that some of the road sections, adjacent to the residential area, are not cleaned properly at some places. On the other hand, some sections have been kept tidy by the residents in those towns. It is assumed that these differences may depend on the recognition of the importance of cleaning and also the distances of such locations from their houses and shops.

(2) Subsidence of Road Surface

It was found during the on-site survey that several parts of the road were subsiding towards a cliff along the Route AB013. The road sections in this project go through the mountainous area where there are frequently heavy rains, which makes the conditions severe for the improvement, operation and maintenance of the roads. It is believed that the road subsidence was not due to any design problems, but occurred unexpectedly. If the road subsides further in the future, it is expected that large-scale road construction works will be required.

(3) Shortage of Maintenance Equipment

According to RDA, the shortage of equipment, especially the large machinery, is a problem closely related to the shortage of budget. It means that it is not always able to supply necessary equipment as needed. It is feared that some problems may arise especially when carrying out a large-scale operation and maintenance work.

Some problems have been observed in terms of structural and financial aspects of operation and maintenance; therefore sustainability of the project is fair.

4. Conclusion, Lessons Leaned and Recommendations

4.1 Conclusion

This project was implemented to improve arterial roads that were regarded as one of the critical social and economic infrastructure facilities in Sri Lanka, and is highly relevant with its development policy and needs of the country. As the actual project period was longer than the planned period, its efficiency is fair. In terms of its future sustainability, there seem to be some concerns about the manpower and budget needed for the roads in terms of their operation and maintenance. But the improved roads have realized smoother traffic flows in the areas covered by this project, which has also encouraged economic activities. The project is also highly appreciated by the roadside residents, and has achieved most of its

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

(1) Securing of Budget for Operation and Maintenance

Appropriate operation and maintenance of the roads is as important as construction and rehabilitation. As more roads are constructed, the demand for operation and maintenance grows. In this respect, it is critical to secure the budget for conducting operation and maintenance work in an efficient way. As the RMTF is an important step towards achieving this, it is desirable to gradually develop a scheme that allows RDA to consider how to make appropriations from the RMTF in a flexible manner so that the effects of operation and maintenance will be maximized.

(2) Management of Road Shoulders by the Residents

This issue is closely related to the sense of ownership and beauty of the residents for the roads. Under the current circumstances, it is difficult for the staff of RDA and local governments to keep the roads free from litter in all road sections, especially during the rainy season. An option for RDA to address this problem is to consider the ways of having the residents regularly clean the roads and do the basic operation and maintenance work, by exploring the possibility of making a certain amount of appropriation for their cleaning activities. As a way of operating and maintaining the roads, a pilot project is now getting launched under the assistance of ADB with a view to introducing a performance-based operation and maintenance program[4]. This initiative is being undertaken to find out how the limited budget can be used effectively for operation and maintenance work. For this purpose, it is desirable to measure its effectiveness and find a combination of methods that would allow national highways to be operated and maintained in the optimal way.

4.2.2 Recommendations to JICA

Despite a number of minor problems, the supervision and the construction work in this project was carried out by the consultants and contractors smoothly. But the sustainability of the project effects, that is, the appropriate operation and maintenance, depends largely on how RDA works to achieve them. In order to keep the roads in good conditions, it will be crucial to do the appropriate operation and maintenance as well as the construction of

[4] In this program, operation and maintenance of certain sections of a road is contracted out for a specific amount of payment. This is expected to make the operation and maintenance work more efficient and create jobs in the private sector.

new roads. Therefore, it seems necessary for JICA to collaborate with other donors such as ADB, which are providing concrete assistance on operation and maintenance, on how the RDA's maintenance budget should be secured and what should be done to strengthen its operation and maintenance system.

4.3 Lessons Learned

In this project, it took as long as one year before completing the pre-qualification assessment of an overseas contractor who had expressed an interest in participating in this project. This became a major factor for the delay in the completion of the project as a whole, despite its generally smooth construction progress afterwards. This experience suggests that in the road or other infrastructure construction projects, making efforts to keep the schedule of tenders for pre-qualification assessment will ensure that the project is to produce its effects much sooner.

Comparison of Original and Actual Scope of the Project

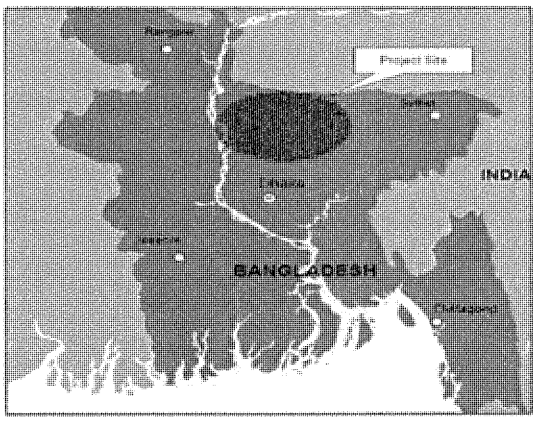
Item	Original	Actual
(1) Project Outputs	Civil Engineering Work a. Improvement of geometric alignment of Route Class A and B (by ensuring the road design standard of Road Development Authority (RDA)) and pavement strengthening [Option 1 work (provision of 7.4 m carriageway and 1.8 m paved shoulders)] - Approximately 20 km on Route AA005 (Gampola – Pussellawa) - Approximately 20 km on Route AB013 (Gampola – Nawalapitiya) b. Pavement Strengthening of Route Class A and B [Option 2 work (provision of 6.0 m carriageway and 1.2 m paved shoulders)] - Approximately 40 km on Route AA005 (Pussellawa – Nuwara Eliya) c. Rehabilitation and widening of bridges - Route AA005 (No. of bridges: 2) - Route AB013 (No. of bridges: 3)	Civil Engineering Work All the components in a., b., and c. in the original scope were implemented and the following components were added as a result of the design review. - 10 bridges, not to be widened in the original design, were widened to 2-lane standards - Shoulders were paved with asphalt concrete which were proposed to do with SBST/DBST - A concrete-lined vehicle tunnel, 220 m long, 6.0-7.2 m wide with 4.2 m clearance was constructed - A utility corridor of minimum 0.5 m width was provided for future improvements - A weighbridge was installed in Gampola to prevent overloading - Built-up drains were provided on one side of the road to facilitate drainage
	Consulting Services a. Pre-contract assistance b. Construction supervision c. Assistance to RDA in Operation & Maintenance d. Environmental Protection Planning of environmental protection method during construction Environmental monitoring during construction Total of 544 MM	Consulting Services a. Pre-contract assistance, Pre-qualification assessment of contractors b. Design review c. Construction supervision d. Preparation of Operation & Maintenance manual e. Planning and supervision of environmental protection work Total of 772 MM
(2) Project Period	August, 1999 – March, 2005 (68 months)	August, 1999 – March, 2007 (92 months)
(3) Project Cost - Amount paid in foreign currency - Amount paid in local currency Total Japanese ODA loan portion Exchange Rate	 1,508 million yen 2,501 million yen (1,352 million Rupees) 4,009 million yen 3,078 million yen 1 Rupee = 1.85 yen (As of January, 1999)	 1,466 million yen 3,377 million yen (2,761 million Rupees) 4,843 million yen 3,075million yen 1 Rupee = 1.22 yen (Average between August, 1999 and March, 2007)

Bangladesh

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

Keisuke Nishikawa
Ernst & Young Advisory Co., Ltd.

1. Project Description



Project Location

Rural Road Developed in the Project
(Mymensingh District)

1.1 Background

The rural population of Bangladesh accounts for as high as 80% of the total population. It is critically important to promote rural development not only in the agricultural sector, but also to foster non-agricultural industries. However, the problem of underdeveloped roads, village markets and other rural infrastructure poses a major impediment to the smooth distribution and sale of agricultural products, the procurement of fertilizers, seeds, farm machinery and other agricultural inputs, and the promotion of commerce and transportation services.

The project area covers an area with a population of 25 million; roughly 20% of the country's total. Agriculture forms the core of the regional economy, which has a high potential for growth, subject to the vitalization of transportation and physical distribution. However, the poverty rate in the project area is above the national average and literacy rate is below the average. A high percentage (about 40%) of the farmers also either owns land no larger than 0.5 acres or owns no land at all. Most of them are farm workers who are employed only on a temporary basis. Some parts of the project area have never received any large-scale rural infrastructure improvement projects, and the underdevelopment of rural infrastructure has prevented smooth physical distribution, depriving the local residents of the opportunity to realize their growth potential.

It was considered very important to improve the roads and other rural infrastructure on a continuing basis to promote economic growth in the rural areas, and this project was implemented in this context. The project was implemented as a co-financed project with the Asian Development Bank (ADB), the International Fund for Agricultural Development (IFAD) and the Swedish International Development Cooperation Agency (SIDA).

1.2 Project Outline

The objective of this project was to promote distribution of goods in five districts (Jamalpur, Sherpur, Mymensingh, Netrokona, and Kishoreganj) in the northern part of Bangladesh by constructing Feeder Road B, setting up the Rural Development Engineering Center (RDEC) and rehabilitating the roads damaged by the 1998 Summer Flood, thereby contributing to the development of the regional economy.

Approved Amount/Disbursed Amount	6,593 million yen / 6,304 million yen
Exchange of Notes Date/ Loan Agreement Signing Date	June, 1999 / July, 1999
Terms and Conditions	Interest Rate: 1.0% Repayment Period: 30 years (Grace Period: 10 years) (Rural Development Engineering Center portion Interest Rate: 0.75%, Repayment Period: 40 years (Grace Period: 10 years)) Conditions for Procurement: General Untied
Borrower/Executing Agency	President of the People's Republic of Bangladesh/ Local Government Engineering Department
Final Disbursement Date	March, 2007
Main Contractor (Over 1 billion yen)	-
Main Consultant (Over 100 million yen)	-
Related Projects	JICA, "Rural Development Engineering Center Setting-up Project in Bangladesh"

2. Outline of the Evaluation Study

2.1 External Evaluator

Keisuke Nishikawa, Ernst & Young Advisory Co., Ltd.

2.2 Duration of Evaluation Study

Duration of the Study: December, 2009 – November, 2010

Duration of the Field Survey: April 22 – May 9, 2010, and July 13 – July 23, 2010

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

3.1 Relevance (Rating: a)

3.1.1 Relevance with the Development Policy of Bangladesh

Poverty reduction continued to be a major policy objective of Bangladesh under its Fifth Five-Year Plan (1997–2002) as it was also the case under the Fourth Five-Year Plan. In order to achieve this objective, the Plan called for vitalization of the rural economy and the extension of social services (primary education, sanitation and hygiene, etc.) in rural communities. Rural development was particularly given high priority. It enjoyed a 10.13% budget allocation under the Fifth Plan, with a considerable increase from the 4.76% allocation under the Fourth Plan. Rural infrastructure improvement received a particularly strong focus, with 64% of the rural development budget being allocated to this goal.

The Poverty Reduction Strategic Paper (PRSP) that followed up the Fifth Five-Year Plan likewise emphasized the rural road improvement as being important for rural poverty reduction and socioeconomic growth. The National Strategy for Accelerated Poverty Reduction II (FY2009-11) that is currently in effect positions road connectivity including rural roads as a major potential contributing factor to socioeconomic growth and poverty reduction in rural communities.

In short, the importance of poverty reduction and socioeconomic development has been recognized constantly by the government from the time of project planning through to the present ex-post evaluation. The government's recognition of the importance is also reflected in the large amount of budget allocated to the Local Government Engineering Department (LGED).

In terms of specific policy measures, the National Land Transport Policy (NLTP) that was formulated in 2004 pursuant to the I-PRSP (developed in 2003) stressed the importance of road connectivity and bridge construction to improve national road networks. A Rural Road Master Plan was then formulated in 2005 setting out the directions for rural road improvement and delineating the road construction and maintenance plans. This ODA project is an embodiment of this Master Plan in the five districts of northern Bangladesh and is therefore highly relevant.

3.1.2 Relevance with the Development Needs of Bangladesh

In rural areas, the shortage of roads, village markets and other rural infrastructure has prevented socioeconomic development from reaching its full potential. Smooth distribution and trading are as important to the rural economy as assured access by the residents to social services, but the inadequacy of many markets and rural roads made it difficult to build up full networks of transport and commerce. During the rainy season, access was virtually cut off even for human-powered means of transportation.

Under these circumstances, the project planned in 1997 by ADB for the 13 districts in the northern and northwestern parts of Bangladesh and JICA's implementation of a portion of the project on a co-financing basis had great significance for alleviating the aforementioned problems that the rural areas of Bangladesh were faced with.

The rural road referred to as "Feeder Road B"[1] was the dominant class of road among the roads that were developed by LGED. As a result of road improvement projects implemented in recent years, the paved proportion of Feeder Road B rose significantly. The proportion of pavement on Feeder Road B that was no higher than 20% in the 1990s has been rising steadily and the improvement efforts can be said to be making substantial progress. However, 51% was still unpaved in 2005 and even at the time of this ex-post evaluation 35% remains unpaved, waiting for improvements. There has been a continuing strong need for road improvements in the development of the rural economy and society, and the implementation of the project under ex-post evaluation has been quite relevant to the development needs of the rural areas of Bangladesh. It is anticipated that in the coming years there will be an increasingly greater need for road maintenance and repairs along with new improvement projects.

3.1.3 Relevance with Japan's ODA Policy

With the recognition that the growth of the agricultural sector and fostering of non-agricultural industries are indispensible for development in rural Bangladesh, a country that had 80% of its people living in rural areas, rural development had been a priority target of JICA's ODA. In particular, road improvements have been regarded as an area for new and focused assistance, since these would contribute not only to the vitalization of local economies, but also to the generation of substantial economic benefits through the integration of these economies into the national economy. Accordingly, this project was found to be relevant to Japan's ODA policy at that time to contribute to rural development through rural infrastructure improvements.

This project has been highly relevant with Bangladesh's development policy,

[1] Feeder Road B is now called an "Upazila Road."

development needs, as well as Japan's ODA policy; therefore its relevance is high.

3.2 Efficiency (Rating: a)

3.2.1 Project Outputs

The project under evaluation pertains to rural infrastructure improvements in 13 districts of northern Bangladesh and was implemented as a co-financed project with ADB, IFAD and SIDA. JICA was responsible for the improvement of Feeder Road B, the Rural Development Engineering Center (RDEC) and emergency flood protection (road rehabilitation), as detailed in Table 1. A comparison of the final outputs for which JICA was responsible and the initial plans at the time of project appraisal is summarized in Table 2.

Table 1: Overall Plan and Supporting Agencies at the Time of Project Appraisal

Component	Sub-component	Details	Supporting agency	
Development of the Road Network	Improvement of Feeder Road B • Roads 1,250 km • Bridges, culverts 3,300 m	Surface the unpaved roads / Build bridges and culvers	5 northern districts JICA 652 km JICA 2,340m	8 northwestern districts ADB 598 km ADB 960 m
	Rural roads (bridges/culverts) 4,800 m	Develop/improve rural roads connecting to Feeder Road B	ADB	
Rural Development Engineering Center	Center construction and equipment procurement	Increase the sustainability of the infrastructure facilities constructed under the project	JICA	
	Consulting services	Design the Center, supervise construction, plan training programs	JICA	
	Technical assistance	Technical cooperation project requested for the capacity enhancement of officials	JICA (considered as a separate project)	
Development of Growth Centers	Development of 173 Growth Centers	Develop markets connecting to Feeder Road B and other core markets	ADB	
Development of Ghats	Development of 41 ghats	Develop ghats	ADB	
Flood Protection	Construction of 64 evacuation centers Submersible roads 15 km	Construct roadside evacuation centers Construct experimental water-resistant submersible roads to prepare for the flood season	IFAD	

Component	Sub-component	Details	Supporting agency
Community Support	Improvement of women's income (tree planting, setting up shop at Growth Centers)	Employ female workers for roadside tree planting and weeding to maintain the roads in good condition	IFAD
Capacity Enhancement	Training of LGED officials Training of local government officials, etc.	Enhance the capacities of officials in the treasury, information and other bureaus	IFAD
Project Implementation Support	Consulting services	Design the infrastructure facilities except for the Center construction, assist the bidding process, supervise the construction	ADB, SIDA
	Machinery and equipment procurement	Purchase construction machinery and equipment, civil construction test equipment	
Emergency Flood Protection (road rehabilitation)	Road rehabilitation	Rehabilitate roads in the northern region that were damaged by floods	JICA

Source: JICA appraisal document

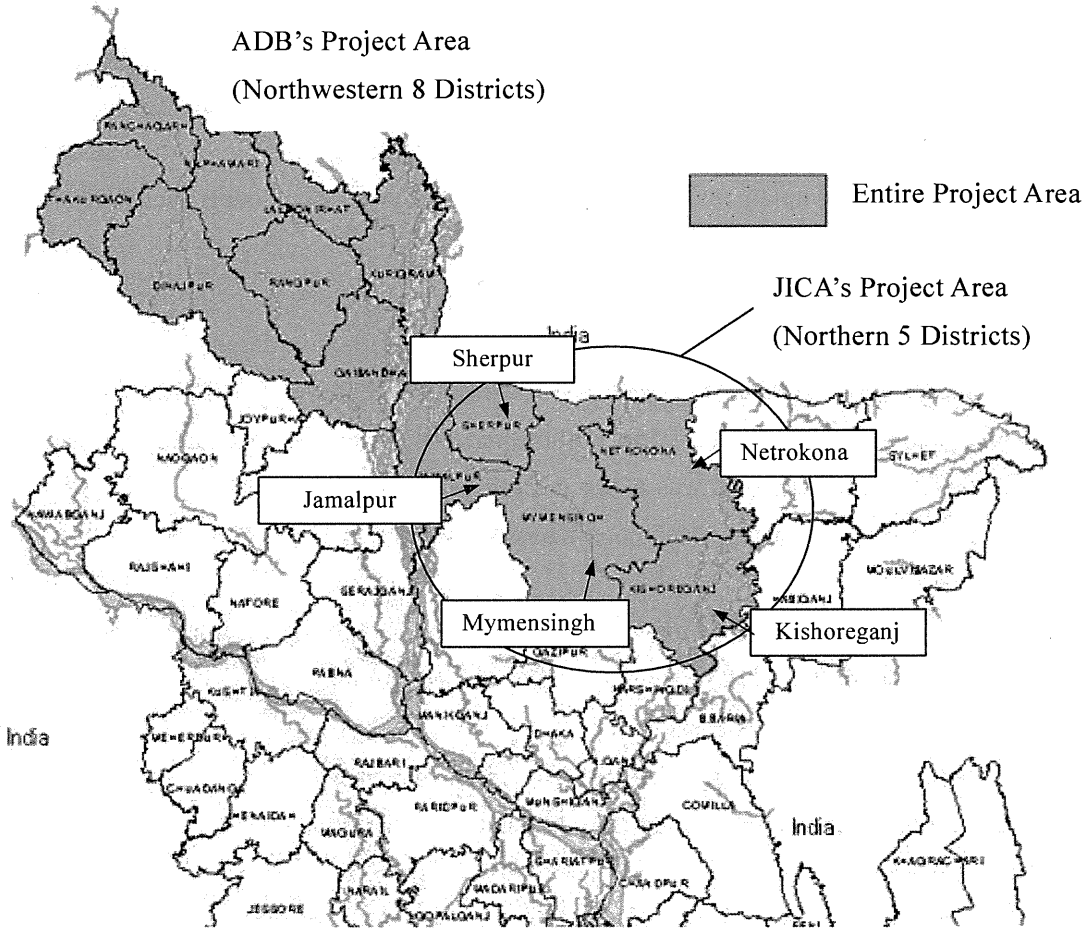
Table 2: Comparison of the Original/Actual Outputs

Item	Original	Actual
Development of the Road Network	Feeder Road B 652 km Bridges/culverts 2,340 m	Feeder Road B 617 km Bridges/culverts 3,664 m
Establishment of a Rural Development Engineering Center	Center construction (6-storied) Machinery and equipment procurement Consulting services	Center construction (15-storied) Machinery and equipment procurement Consulting services
Emergency Flood Protection (road rehabilitation)	1998 flood Roads 160 km Bridges/culverts 650 m	1998 flood Roads 117 km Bridges/culverts 648 m 2004 flood Roads 142 km Bridges/culverts 174 m

The loan agreement was concluded on the basis of the project scope that was defined at the time of project planning. However, the detailed studies that were subsequently-conducted revealed the actual needs of the rural villages concerned. The total length of road to be developed was reduced and the length of bridges and culverts was extended to reflect the actual needs. These project modifications were made in close consultation with the entities involved in the project, including other donor agencies. The contents of these modifications are considered to be relevant.

Given the need for more floor space reflecting the anticipated increase in the LGED workload, a decision was made before starting the construction of RDEC to make the building 15 stories high instead of the originally-planned 6 stories. The additional construction costs were financed from the annual budget of the Government of Bangladesh. JICA was consulted in advance and concurred with the decision. No particular problems were found with respect to this project modification.

As far as the 1998 flood was concerned, the actual total length of rehabilitated road under the emergency flood protection component fell short of that planned, partly because the component was also financed by the government and other donor agencies. The surplus in the project budget was directed to the rehabilitation of roads that were damaged by the 2004 flood. Given the urgency involved at the time of this flood, the addition of this project component may be described as a timely and justifiable decision.



Source: LGED

Figure 1: Project Area

3.2.2 Project Inputs

3.2.2.1 Project Period

The project under evaluation is a co-financed project with other donor organizations, and some preliminary work was underway when the loan agreement was signed. As far as the project components under JICA's responsibility are concerned, however, they were launched following the signing of the agreement. For this reason, the project period was defined to have started in July 1999 with the conclusion of the agreement. As was described in the preceding Paragraph 3.2.1, the project scope was modified at an early stage of project implementation as a result of detailed studies conducted following the signing of the agreement. However, owing to the very efficient project management by LGED, the construction work was virtually completed in June 2005, ahead of schedule.

The overall project period was from July 1999 through March 2006 (81 months), slightly longer than the plan of 78 months from July 1999 through December 2005 (104% of the original plan). The apparent delay, however, was due to the addition of the component "road rehabilitation for the 2004 flood" and it can be said that there was virtually no delay in the original project implementation. Other co-financing organizations implemented their respective project components generally without delay.

3.2.2.2 Project Cost

The originally-planned project cost was 6,593 million yen for JICA's components of the total project cost of 22,566 million yen for the entire co-financed project. The actual amount disbursed was 6,304 million yen, which was lower than the plan (96%) for the following positive and negative reasons:

- Alterations to the total length of roads, bridges and culverts to be developed/improved as a result of the detailed studies
- Increased materials costs
- Cost increases owing to the choice of better road specifications
- Cost reductions through the use of competitive bidding
- Exchange rate differences
- Addition of road rehabilitation for the 2004 flood

The additional expenditures for road rehabilitation for the 2004 flood that was decided upon during the project implementation were offset by the cost savings that had been achieved through efficient implementation of the original project components.

This is worth a high evaluation. Another important element in the project cost savings was the competitive bidding that was adopted for the selection of consultants. Five to six bidders competed and the final contract amount was about one quarter of the originally-budgeted amount.

Although the project period slightly exceeded the plan, the change of the plan, that is, the addition of new project component, can be considered relevant. Therefore, efficiency of the project is high.

3.3 Effectiveness (Rating: a)

3.3.1 Quantitative Effects

3.3.1.1 Results from Operation and Effect Indicators

(1) Annual Average Daily Traffic (AADT)[2]

Under this project numerous roads were either developed or improved. The annual average daily traffic of randomly-sampled road segments has increased after the project implementation in practically all of the districts involved as shown in Table 3. Some segments saw the traffic diminished after the road improvement, but this was due to the road improvements separately implemented in nearby areas and the resulting diversion of some traffic to the new routes. From the perspective of overall traffic flows, there are apparently no problems.

It should be added that comparison of traffic volume before and after the project implementation was difficult, since the first traffic survey of significance was carried out in 2003 and no such data existed at the time of project planning.

Table 3: Trend in the Annual Average Daily Traffic Volume

(Unit: Number of vehicles)

District	Road Section	2003	2005	2006 (Com-pletion)	2007	2008	2009
Jamalpur	Bakshiganj – Jabbergonj	216					814
Sherpur	Nakla – Tarakanda - Nalitabari				318		384
Mymensingh	Nandail – Bakchanda			267		586	780
	Shambugonj – Ambikagonji	722		626		411	240
Netrokona	Kalmakanda – Nazipur	2,329				3,402	
Kishoreganj	Karimganj – Gundhar		410		1,231		1,272

[2] Computed from data collected during a 12-hour period (8:00 a.m. – 8:00 p.m.) on a day on which the market was operating and another when it was not.

Note: The data are not necessarily exhaustive since surveys were not conducted every year at the same sections.
Source: Prepared from LGED data

(2) Improved Average Speed and Reduced Transportation Costs

Before the project was implemented, the roads were unpaved and the surfaces were rough. There were not enough bridges and in the rainy season even rickshaws could not be used. People simply had to move around on foot. For these reasons, it took 18 minutes on average to move a distance of 1 kilometer (about 3 km/hr) before the project implementation, while people were able to use vehicles after the project was completed, needing only 3 minutes to travel the same distance (about 20 km/hr) as is shown in Table 4. A beneficiary survey[3] revealed that the cost of transportation was reduced to about one-third overall. These findings lead to the conclusion that the road development/improvement had the effect of significantly increasing the average speed of travel and of considerably reducing transportation costs.

Table 4: Improved Average Speed of Travel and Reduced Transportation Costs

District	Speed of travel (km/hr)		Transportation costs (Taka/km)	
	Before	After	Before	After
Jamalpur	3	10	7.46	1.83
Sherpur	3	20	7.55	2.27
Mymensingh	3	20	7.25	2.45
Netrokona	3	20	5.55	2.92
Kishoreganj	4	20	5.44	2.05
Average	**3**	**20**	**6.67**	**2.44**

Note: The transportation cost reductions represent the difference between the fees the residents paid for the means of transportation before and after the project.
Source: Beneficiary Survey

[3] The beneficiary survey was conducted in the form of interview with 100 respondents in the five districts concerned (in proportion to the lengths of the improved Feeder Road B, 40 respondents in Mymensingh (the largest), 24 in Netrokona, 21 in Kishoreganj, 10 in Jamalpur, 5 in Sherpur).

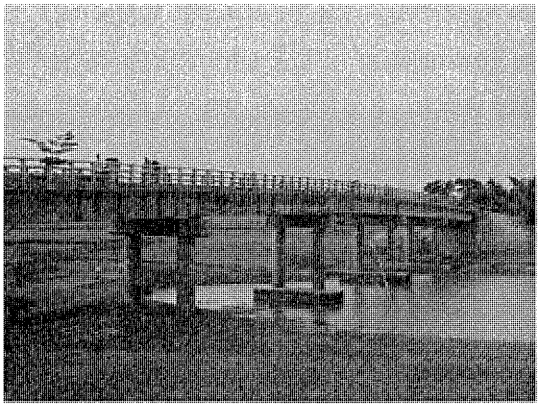


Photo 1. A Bridge Constructed under the Project (Jamalpur District)

Photo 2. A Scene from the Beneficiary Survey (Sherpur District)

3.3.1.2 Results of Calculations of Internal Rate of Return (IRR)

Economic Internal Rate of Return (EIRR)

The EIRR of the project has been computed for roads of all the 13 districts in northern Bangladesh covered by the project with the exception of the emergency flood protection component. As Table 5 shows, the planned EIRR of 29.0% at the time of project appraisal fell to the actual rate of 20.1% at the time of the ex-post evaluation. According to an interview with ADB that served as the overall project coordinator, there was a cost overrun mainly in Mymensingh, the largest district in the project area. This district has many lowlands and most rural roads are built on embankments constructed for flood protection purposes. The road surface had to be elevated for the improvements and this resulted in higher construction costs than originally anticipated.

Table 5: EIRR of the Project

(%)

	Plan	Actual
EIRR (road portion)	29.0	20.1

Note: Costs include project costs and maintenance costs. Benefits include: vehicle travel costs saved, travel time saved and incremental agricultural value added.

Source: Ex-ante appraisal documents, ADB Project Completion Report

3.3.2 Qualitative Effects

(1) Number of Beneficiaries / Employment Creation

The contemplated beneficiaries of the project include: residents who use the roads, bridges, culverts, village markets and submersible roads[4], users of female-only shops in the marketplace and female road maintenance workers. The total beneficiary population is estimated to have reached 23.58 million.

Photo 3. Women's group doing routine road maintenance work (Jamalpur District)

The project brought about direct employment amounting to 19.17 million person-days for the road construction during the project implementation, and created 183 Women Market Sections (under IFAD's responsibility) as a result of the overall project implementation. Teams of women workers have been organized to perform routine maintenance of the constructed/improved roads; two female workers are employed by the LGED per kilometer of road length. Consequently, a new employment opportunity equivalent to about 1,200 jobs has been created for women in the project area.

(2) Other Qualitative Effects

The road conditions have been substantially improved by the project. Access by the residents to educational institutions, hospitals and other public services has become considerably easier, and so has the provision of public services to the villages. All the respondents in the beneficiary survey confirmed that access to social services had improved. The substantial renovation of road conditions has stimulated physical distribution, which was confirmed by 99% of the respondents in the beneficiary survey.

The asphalt pavement and the construction of highly-durable bridges, culverts and other concrete structures did indeed display a significant effect in preventing flood damages during the rainy season, as was expected at the time of project appraisal.

This project has largely achieved its objectives; therefore its effectiveness is high.

3.4 Impact

3.4.1 Intended Impacts

[4] "Submersible Road" refers to a road that is laid on the ground and is accessible during the dry season but becomes under water and inaccessible during the rainy season. During the rainy season, these localities are only accessible by boat.

The major impacts of the road improvements include the increased number of retail shops along the road and in village markets and also the overall revitalization of village markets. An ADB survey showed that the number of small roadside shops increased 2.3 times on average after the project implementation and the sales revenues of the shops more than doubled, suggesting significant impacts on the regional economy.

According to a private-sector survey contracted by LGED during the project implementation, farmers along the roads not only came to find it easier and less expensive to procure agricultural inputs, but also saw their agricultural outputs increasing by 15% in 2001, 19% in 2002 and 18% in 2003. In the beneficiary survey, all respondents also stated that their farm income had increased due to the road improvements. As Table 6 shows, major contributors to the increased farm income were the lower costs required for the purchase of goods and services and the quicker delivery of products to consumers and the resulting increase in shipment volumes, both achieved due to the improved transport system. Through these impacts, the residents living along the roads feel that their rural life has changed.

Table 6: Factors Contributing to Increased Income

(Unit: %)

Factors contributing to increased income	Percentage
Improved transport system	72
Reduced travel time	13
Reduced transportation costs	11
Creation/expansion of village markets	4
Total	**100**

Source: Beneficiary survey

3.4.2 Other Impacts

(1) Impacts on the Natural Environment

It was hoped at the time of project planning that the road improvements would curb soil erosion from the surface and slopes and prevent degradation of the quality of drain water. After the project implementation, the drain water is reportedly running more smoothly than before and its quality has improved, as a result of the construction of durable structures and the work of local contracting societies in protecting the road surface (unpaved portions) and slopes, planting trees and cleaning. The on-site survey also found no sections of stagnant drains or water contamination.

(2) Land Acquisition and Resettlement

A total of 250 hectares of land were to be acquired for the entire project area including the components under the responsibility of other donor organizations. The LGED states that all the land was acquired in accordance with applicable local laws and the Action Plan set out by the World Bank and ADB and that the affected citizens were duly compensated pursuant to the provisions of the Action Plan. Interviews with former landowners confirmed that they were generally satisfied with the levels of compensation they received. There was no resettlement in connection with the land acquisition.

(3) Other Positive/Negative Impacts

It was planned that the project would create employment opportunities for women in the areas of roadside tree planting, maintenance of road shoulders, etc. As was reviewed in sub-paragraph 3.3.2 above, women's groups have in fact been organized and jobs have been created. The hired women take turns after two years of work. The daily wage is 90 Taka, out of which 54 Taka/day is paid to the female worker at the end of every month and the balance of 36 Taka/day is deposited in a separate account for two years. At the end of the two-year employment period, the total deposit of about 26,000 Taka is paid to the worker as a one-time payment. Some workers use this mandatory saving to purchase farm animals or to set up small shops. This is a very effective way of wage payment, particularly for female employees and is working with positive results. The success is attributed to the direct initiative taken by LGED in organizing and leading the women workers out of its Upazila Offices by taking advantage of the proximity of these offices to the local communities.

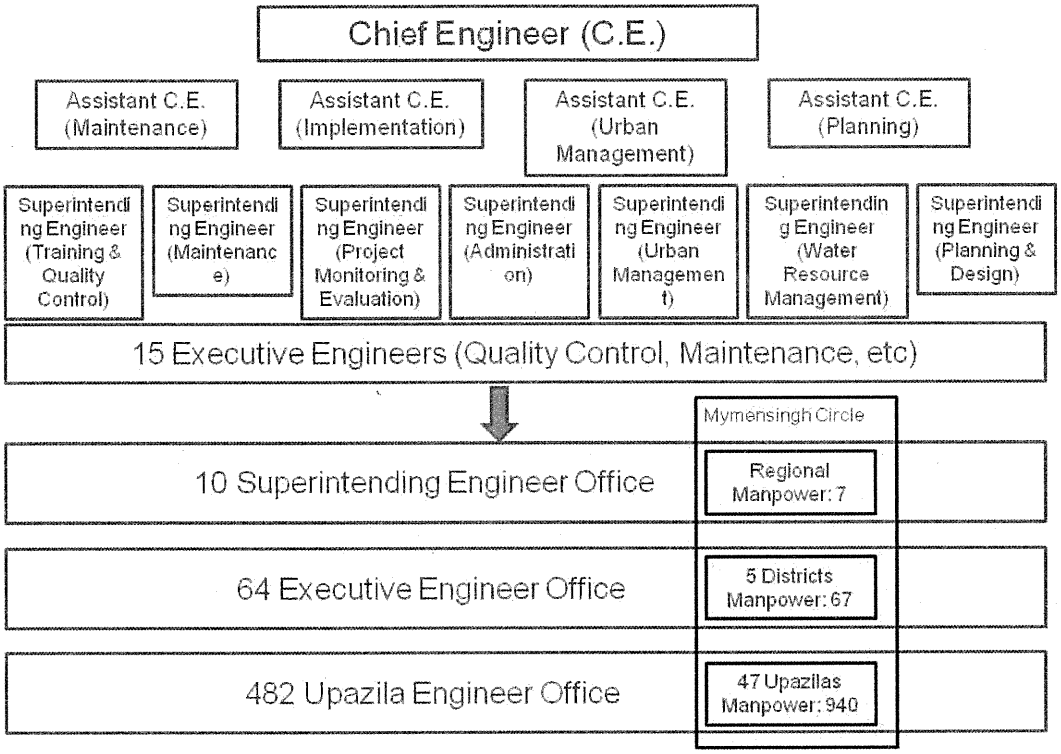
3.5 Sustainability (Rating: b)

3.5.1 Structural Aspects of Operation and Maintenance

After completion of the project, the Feeder Road B is to be maintained by the Rural Infrastructure Maintenance Management Unit (RIMMU). Under RIMMU, three-tier Operation and Maintenance (O&M) teams have been organized at the regional level, and the total number of O&M personnel in the five districts (Mymenshingh Circle) covered by the project under evaluation is 211. In addition, surveyors and assistants who are also engaged in maintenance are stationed in all Upazilas. Altogether, a total of 446 persons are involved in the maintenance in the five districts. In view of the rising importance of operation and maintenance, the LGED has promoted the top maintenance manager from the previous position of Superintending Engineer to Additional Chief Engineer, in order to make the overall coordination more effective. The RDEC is maintained by the Building Maintenance Unit (BMU) of the Administration Division of the Headquarters.

In actual practice, officials are assigned even at the Upazila level very close to the

location of the actual work to ensure proper management of the women's groups that perform the routine road maintenance work. The number of personnel in the Mymensingh Circle covering the five districts of the project area was 164 until recently, but the assignment of an engineer to every Upazila as a frontline supervisor (47 engineers in total) is expected to make future maintenance work even more effective.



Source: Prepared from LGED data

Figure 2: Organization Chart of LGED
(simplified for the purpose of its relevance to the project)

3.5.2 Technical Aspects of Operation and Maintenance

LGED offers regular training courses on road maintenance at the RDEC to its engineers at the Headquarters and local offices. In the fiscal year 2008/09, 110 engineers attended a 5-day course entitled "Training on Road Maintenance Management (RMM)." In addition, middle management engineers are dispatched overseas for training, and a variety of training and education programs covering maintenance and other related topics are offered as part of various projects promoted by donor organizations for the benefit of not only LGED officials but also local residents and other related parties concerned. During the 2008/09 fiscal year, a total of 330 training courses were offered by LGED, which were attended by more than 440,000 people around the country.

Pursuant to the Road Asset Management System (RAMS), LGED has established procedures to identify the maintenance needs through surveys of road and traffic

conditions, and to determine the annual priority order of the maintenance work to be done, based on the survey findings. A database has been developed for this purpose called the "Road and Structure Database Management System (RSDMS)."

LGED sees no technical problems with regard to routine maintenance and the on-site survey found no technical problems, either. The technical training is also focused on the capacity building of engineers, as is detailed in the article in the box on the next page.

3.5.3 Financial Aspects of Operation and Maintenance

LGED's road maintenance budget has gradually risen during the 2000s, with a considerable jump in fiscal 2004/05. This was due to the Japan Debt Cancellation Fund (JDCF) out of which an amount of 1.2 billion taka began to be directed to road maintenance. While the maintenance budget of LGED is on the increase, it is less than the required amount[5], failing to meet the increasing demand for maintenance, as is illustrated in Table 7. Moreover, the shortfall is gradually becoming greater.

Table 7: Trend in the Maintenance Budget (LGED total)

(Unit: Million Taka)

Fiscal year (July-June)	Maintenance budget	Required maintenance costs		
		Repairs	Maintenance	Total
2001/02	1,250	No records	3,268	-
2002/03	1,650		3,701	-
2003/04	2,000		3,736	-
2004/05	3,800		5,124	-
2005/06	4,000	4,802	5,546	10,348
2006/07	4,315	5,914	6,961	12,875
2007/08	4,900	7,045	8,273	15,318
2008/09	4,900	8,343	9,778	18,121
2009/10	5,085	9,830	11,501	21,331

Source: Prepared from LGED data

[5] Based on estimates in the Rural Road Master Plan; estimated by assuming the annual inflation rate of 10%

Rural Development Engineering Center Setting-up Project
(JICA Technical Cooperation Project)

Outline/Objectives

The RDEC is the training facility of the LGED that was constructed as a part of the project with the objective of enhancing the technical capacity of the LGED. Following the completion of its construction, a JICA technical cooperation project entitled "Rural Development Engineering Center (RDEC) Setting-up Project" is being implemented as a related project. The RDEC Setting-up Project is promoted in two phases and the following outcomes were achieved during Phase I that extended between 2003 and 2006 (excerpts from the PDM with some additions):

- *The technical knowledge and expertise that the LGED has acquired through previously-implemented projects came to be accumulated in the RDEC and was made ready for common sharing within the LGED.*
- *Information management on technical standards and application methods for rural infrastructure improvements has been improved.*
- *For the full performance of RDEC's functions, traditional training systems have been improved including reinforcement of the insufficient basic technologies and techniques.*
- *The above outcomes are to be used as the basis for the development of future operational plans for the RDEC (Step-up Plan).*

As of this writing, Phase II has been underway since 2007 with a planned duration through 2011 for the purpose of assisting implementation of the Step-up Plan that was formulated during Phase I. The capacity enhancement of engineers is pursued through technical cooperation focused on the planning, design, quality control and maintenance of Geographical Information Systems (GIS) related to the management of project cycles for rural infrastructure improvements.

Photo 4: RDEC, built under the Project

Survey results

In this ex-post evaluation, a questionnaire survey[6] was conducted for the main purpose of confirming that, through the technical cooperation project that had been implemented at the RDEC built as a part of the project under evaluation, the major beneficiary (LGED engineers) had indeed acquired knowledge and techniques and were applying them in their daily work.

Of the trainees on road maintenance and management surveyed, 97% responded that the course was either "very useful" or "useful." All respondents acknowledged that the training deepened their professional knowledge. Asked if the knowledge had been actually applied in their routine activities, 60% responded "fully" and another 39% "partly." It can be concluded that the trainees are generally highly satisfied with the course and are applying the acquired knowledge to the actual work. The courses given at the RDEC were found to be satisfactory by 89% of the respondents and all agreed that the Center was functioning as the nucleus of the LGED's technical capacity enhancement.

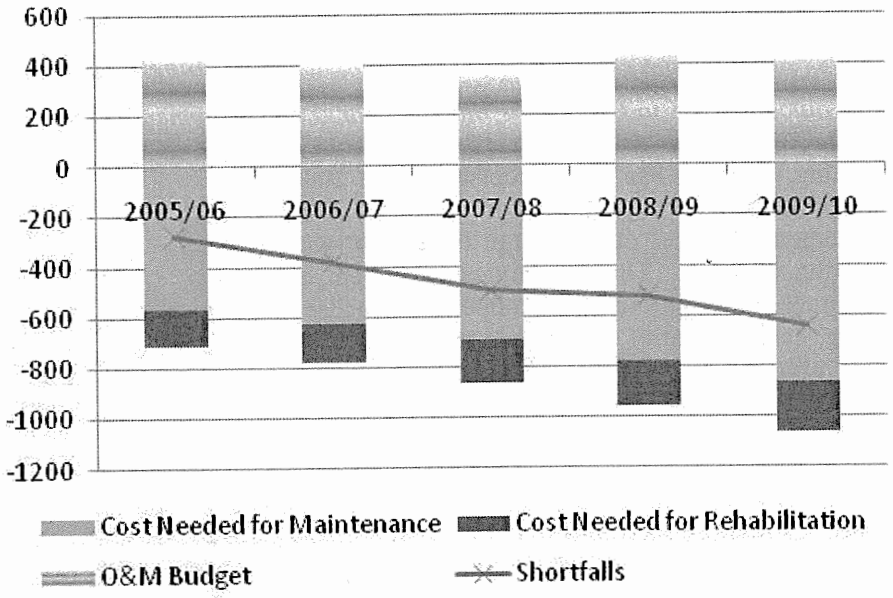
[6] The questionnaire survey was conducted to LGED engineers who attended maintenance and management training courses at the RDEC sometime between 2005 and 2010. There were 108 effective respondents, consisting of 38 Upazila Engineers, 37 Senior Assistant Engineers and 33 Assistant Engineers who report to the Upazila Engineers.

Meanwhile, the frontline engineer respondents considered that the maintenance budget is generally insufficient and felt that one of the challenges was how to apply the knowledge and techniques more often to the actual work.

Relevance to the project

The RDEC was constructed as part of the project, and a technical cooperation project is subsequently ongoing as a related project, using the Center as the site of program development. Thus, a firm base for training was established on which numerous programs are being executed. As a result, the capacity for rural infrastructure improvements and maintenance has been solidly enhanced. It is fair to say that this integrated strategy of Center construction and the setting up of a training system built into the counterpart's organization has been quite effective in enhancing the long-term maintenance capacity. The integrated combination of an ODA loan project and a technical cooperation project as in this case is feasible and effective if the counterpart has a high level of ownership and is well-organized and disciplined like the LGED.

(Unit: Million Taka)



Source: Prepared from LGED data

Figure 3 Trends in the Maintenance Budget and Required Costs for the Five Districts Covered by the Project

About one-tenth of LGED's total maintenance budget, or 400 million Taka, is allocated to the five districts covered by the project (See Fig.3). Since road conditions in the area have been more or less improved by the project, the allotted share of the total LGED budget is declining. As in other areas of the country, the increase in the budget allocated to the five districts falls short of the increases in the required maintenance costs.

The allocation from the Japan Debt Cancellation Fund (JDCF) is valid only for a period of ten years. Accordingly, a major challenge is to secure a stable source of a sufficiently

large maintenance budget. The Bangladesh government looked into various options including the creation of a road maintenance fund and the introduction of an performance-based maintenance program. But there were doubts about their feasibility and no measures have been materialized. Even though no concrete prospects with regard to post-JDCF funding crediting are yet in sight, there is reportedly an increasing awareness in the government on the importance of road maintenance. However, no specific policies have been determined, and it is not clear how effectively the increasing maintenance needs will be addressed.

3.5.4 Current Status of Operation and Maintenance

Operation and maintenance of the road involve all the LGED officials who are working at the Headquarters, District Offices or Upazila Offices. The operation is planned and scheduled according to the results of road condition studies and maintenance cost estimates.

Because the roads, bridges and culverts were constructed relatively recently, they are generally well-maintained although insufficient maintenance work (surface repairs and the like) was detected at a few locations. As mentioned earlier, the road shoulders are constantly maintained by the groups of low-income female workers who were organized for the purpose. Their work helps protect the slopes and prevent flood damage.

Since 2006, LGED uses an internationally-accepted indicator for road roughness, the International Roughness Index (IRI) to measure and record the road conditions. The segments of road that were developed and improved by the project were generally in good condition upon project completion. Some sections that have suffered subsequent damage were reportedly repaired by the LGED in the 2009/10 fiscal year.

Table 8: Trend in the International Roughness Index (IRI)

District	Road Section	2006 (Completion)	2007	2009	Post-project repair (FY2009/10)
Jamalpur	Bakshiganj – Jabbergonj	7.30	6.80	10.30	Yes
Sherpur	Nakla – Tarakanda – Nalitabari	5.00	6.00	9.00	Yes
Mymensingh	Nandail – Bakchanda	5.30	5.20	5.28	Yes
	Shambugonj – Ambikagonji	6.90	5.00	6.60	No
Netrokona	Kalmakanda – Nazipur	6.00	-	5.90	Yes
Kishoreganj	Karimganj – Gundhar	4.70	5.10	7.60	Yes

Note: The LGED rates the IRI; below 6 as "Good", 6-8 as "Fair", 8-10 as "Slightly poor" and over 10 as "Poor."
Source: LGED data

Machinery and equipment for monitoring and maintenance are reported to be not suffering from a shortage of funds, causing no inconvenience in routine work. Patrolling services by the LGED engineers is rendered frequently even though on an irregular basis, and the local residents living along the roads are fully aware of their services.

Some problems have been observed in terms of financial aspects; therefore sustainability of the project is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

Rural development has constantly been a priority national goal in Bangladesh, a country characterized by a high farm population ratio. The project, which has contributed to the development of the rural road infrastructure, has very high relevance. Reflecting the high project execution capacity of the LGED, the project was in effect completed by the planned date and the effective project costs were kept within the budget. In terms of effectiveness, the traffic increased, the average speed of travel went up, and transportation costs were saved. Furthermore, access to commercial activities along the road and to social services has been ameliorated. The project can be said to have fully achieved its objectives. No problems exist over the structural and technical aspects of the LGED. There is, however, one concern over the availability of a sufficient budget for future operation and maintenance, as the difference between the available budget and the required maintenance costs continues to widen.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

Securing of maintenance budget and cost reductions

Road maintenance is expected to be increasingly important in the years ahead. It is recommended that a sufficient budget be secured for this purpose and that the possibilities for contracting some of the pavement repair work to private companies be explored depending on the size of the work required, with a view to reducing maintenance costs. Such contracting might contribute to nurturing local industries in this area.

4.2.2 Recommendations to JICA

In the face of the rising financial needs for maintenance, Japan has cooperated mainly

through the JDCF in recent years. It is felt important that Japan together with ADB and other donor organizations encourages the Bangladesh government to put a stronger focus on more fundamental solutions for road repair and maintenance.

4.3 Lessons Learned

(1) Organizing Women's Groups

The scheme of road maintenance operations through the organization of the groups of local low-income female workers who otherwise have few opportunities to earn cash income is judged to be an effective tool for rural infrastructure improvements in Bangladesh. In fact, similar moves to organize groups are proceeding in other parts of the country. A major reason for the success is believed to be the active involvement of LGED in assigning engineers even to the Upazila level and extending direct guidance to the farmers in the road maintenance work. This road maintenance scheme may well be replicable and applicable to similar projects in other countries as a model for rural road maintenance.

(2) Coordination of Yen Loan and Technical Cooperation Projects

The combination of the loan project and the ensuing technical cooperation project was a major characteristic of this project, and there was a clear synergy that was triggered by the project. The construction of the RDEC in this project represented the establishment of a permanent and well-equipped training facility and the possibility of executing a multi-year technical cooperation projects that are oriented towards technical capacity enhancement and the in-house development of training programs for LGED officials. The capacity development efforts for all classes of LGED engineers, backed by sustained training programs, lead to the extension of the road improvement and maintenance technologies and techniques to many other projects. One reason for the success was the strong commitment and active participation of the LGED Chief Engineer and his associates who led the LGED efforts to enhance the organization's overall capacity as a responsible project leader of the loan project and a counterpart of a technical cooperation project.

In this project, the training facility was constructed as a part of the loan project, and it is fully utilized to enhance the capacity of counterpart officials through the execution of a following technical cooperation project. It is worth noting for the future consideration of similar projects that this project has been characterized by the strong ownership of the executing agency and the organic coordination of facilities construction and technical cooperation with a view to realizing overall project effectiveness between the two projects.

Original/Actual Comparison of Major Project Parameters

Item	Original	Actual
(1) Outputs	Development of Road Network Feeder Road B: 652 km Bridges and Culverts: 2,340 m	Development of Road Network Feeder Road B: 617 km Bridges and Culverts: 3,664 m
	Establishment of Rural Development Engineering Center Construction of Center (6 stories) Procurement of Equipment Consulting Services	Establishment of Rural Development Engineering Center Construction of Center (15 stories) Procurement of Equipment Consulting Services
	Emergency Flood Protection (Rehabilitation of Roads, etc.) [1998 Flood] Road: 160 km Bridges and Culverts: 650 m	Emergency Flood Protection (Rehabilitation of Roads, etc.) [1998 Flood] Road: 117 km Bridges and Culverts: 648 m [2004 Flood] Road: 142 km Bridges and Culverts: 174 m
(2) Period	July 1999 – December 2005 (78 months)	July 1999 – March 2006 (81 months)
(3) Project Cost Amount paid in foreign currency	141 million yen	0 million yen
Amount paid in local currency	6,452 million yen (2,491 million Taka)	6,304 million yen (3,150 million Taka)
Total (JICA's portion out of the total co-financed amount)	6,593 million yen	6,304 million yen
Exchange Rate	1 Taka = 2.59 yen (As of November 1998)	1 Taka = 2.00 yen (July 1999 – March 2006)