

Country Name	Bridge Management Capacity Development Project
People's Republic of Bangladesh	

I. Project Outline

Background	Bangladesh experienced a firm economic growth maintaining the annual GDP growth rate of about 6 % for the recent years. Along with that, freight volume has increased by approximately 8 times in the 30 years between 1975 and 2005, and the freight volume and the number of passengers maintained an upward trend at a pace of 6-7 %. Among the major transport means in Bangladesh such as inland waterway, railway and road, the proportion of road use in both passenger and freight exceeded 80 % in 2005. However, new road constructions were not adequately implemented against an increase in the traffic volume, and conditions of existing road were deteriorating due to the incompetent capacity on roads/bridges maintenance and budgetary deficit. Those obstacles were hindering smooth transportation of passenger and freight.										
Objectives of the Project	Through developing bridge maintenance framework, bridge inspection / evaluation manual and bridge rehabilitation / strengthening manual and bridge management system, and enhancing RHD staff's knowledge of bridge management, the project aimed at improving bridge maintenance capacity of RHD, thereby contributing to enhancement of bridge management under RHD.										
	<ol style="list-style-type: none"> Overall Goal: Bridge management under RHD is enhanced. Project Purpose: Bridge maintenance capacity of RHD is improved. 										
Activities of the Project	<ol style="list-style-type: none"> Project site: the whole area of Bangladesh Main activities: 1) Developing bridge maintenance framework, 2) Developing bridge inspection / evaluation manual and bridge rehabilitation / strengthening manual, 3) Developing bridge management system, 4) RHD staff's enhancement of necessary knowledge of bridge management. Inputs (to carry out above activities) <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">Japanese Side</td> <td style="width: 50%;">Bangladesh Side</td> </tr> <tr> <td>1) Experts: 12 persons</td> <td>1) Staff allocated: 19 persons</td> </tr> <tr> <td>2) Trainees received in Japan: 16 persons</td> <td>2) Land and facility: an office space in RHD</td> </tr> <tr> <td>3) Equipment: Computers for database with accessories and Concrete testing equipment (Re-bar detector, Concrete core sampling apparatus, Electric drill, Robot camera).</td> <td>3) Local expense: Travel expenses, daily allowance, accommodation, etc.</td> </tr> </table> 			Japanese Side	Bangladesh Side	1) Experts: 12 persons	1) Staff allocated: 19 persons	2) Trainees received in Japan: 16 persons	2) Land and facility: an office space in RHD	3) Equipment: Computers for database with accessories and Concrete testing equipment (Re-bar detector, Concrete core sampling apparatus, Electric drill, Robot camera).	3) Local expense: Travel expenses, daily allowance, accommodation, etc.
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Project Period	(ex-ante) June 2015 – November 2017 (actual) July 2015 – September 2018	Project Cost	(ex-ante) 250 million yen, (actual) 338 million yen								
Implementing Agency	Roads and Highways Department (RHD) under Road Transport and Highways Division of Ministry of Road Transport and Bridges (MoRTB)										
Cooperation Agency in Japan	Japan Bridge & Structure institute, Inc. Oriental Consultants Global Co., Ltd. Japan Bridge Engineering Center										

II. Result of the Evaluation

< Special Perspectives Considered in the Ex-Post Evaluation >

- The current status of the indicators for the Project Purpose was verified by assessing the indicator 2 of the Overall Goal in case of the indicator 1 of project purpose and the technical aspects in sustainability in case of the indicator 2 of project purpose.
- Due to the terrorism incident in Dhaka in 2016, the project could not be virtually implemented and was extended 8 months of the project period. Since this extension was unexpected and unavoidable, 8 months was eliminated from the project period to evaluate the efficiency.

1 Relevance
<p><Consistency with the Development Policy of Bangladesh at the time of Ex-ante Evaluation></p> <p>The project was consistent with the Bangladesh development policies such as “Sixth Five Year Plan” (2011-2015) in which the Government of Bangladesh defined that efficient and modern road transportation system played an important role in the road sector. “National Land Transport Policy” (2004) described that enhancing maintenance capacity, securing budgets and formulating a long-term development plan were prioritized as an important policy. “Road Master Plan” (2009) mentioned that maintaining asset value of roads and bridges was one of the aims to be focused.</p> <p><Consistency with the Development Needs of Bangladesh at the time of Ex-ante Evaluation></p> <p>The project was consistent with the Bangladesh development needs for the capacity development on bridge management.</p> <p><Consistency with Japan's ODA Policy at the time of Ex-ante Evaluation></p> <p>The project was consistent with the Japan's ODA policy for Bangladesh. “The Country Assistance Policy for Bangladesh” (2012) set “acceleration of economic growth which all people can benefit from toward becoming a middle-income country”, including “development of transportation infrastructure”, as one of the priority areas.</p> <p><Evaluation Result></p> <p>In light of the above, the relevance of the project is high.</p>
2 Effectiveness/Impact

<Status of Achievement of the Project Purpose at the time of Project Completion>

The Project Purpose was achieved by the time of project completion. Bridge maintenance cycle was commenced in Manikganj Division (one division out of 65 divisions of RHD) and it was going to commence in other divisions after the rainy season (Indicator 1). Divisional training course based on institutional capacity development plan in bridge maintenance management standard (draft) was carried out in 65 divisions of RHD (Indicator 2).

<Continuation Status of Project Effects at the time of Ex-post Evaluation>

The project effects have been continued at the time of project completion. The current status of the indicators for the Project Purpose was verified by assessing the indicator 2 of the Overall Goal in case of the indicator 1 of project purpose and the technical aspects in sustainability in case of the indicator 2 of project purpose.

<Status of Achievement for Overall Goal at the time of Ex-post Evaluation>

The Overall Goal has been partially achieved at the time of ex-post evaluation based on the data collected for two indicators.

Actual ratio of bridge inspection conducted by RHD is only 10% due to lack of human resources (Indicator 1). The bridge maintenance cycle has been completed in some bridges. Primarily routine inspection has been done. Then other steps of the bridge maintenance cycle have been followed (Indicator 2).

<Other Impacts at the time of Ex-post Evaluation>

Some positive impacts related to gender were observed. As a direct impact, a number of female employees engaged in the training programs for bridge maintenance. Almost all the female officers received training on the bridge management cycle. The trained female field officers trained their subordinate and/or peer staff accordingly. As an indirect or long-term impact, the number of female engineers has increased, which has improved the status of women in the organization.

As another positive impact, mindsets of the training participants has been changed regarding bridge inspection and maintenance. Although RHD's normal practice was simply to replace damaged bridges with new ones until this Project began, retrofitting and maintenance of bridges have recently got substantial recognition importance in a strategy of RHD. Funding of bridge maintenance has also been increased, especially in the fiscal year of 2022.

The project also benefitted to ODA loan bridge development projects, such as Eastern Bangladesh Bridge Improvement Project, Western Bangladesh Bridge Improvement Project, The Kanchpur, Meghna, Gumti 2nd Bridges Construction and Existing Bridges Rehabilitation Project, whose development and maintenance work falls in jurisdiction of RHD. At the time of the ex-post evaluation, Master Trainers (MTs) and their subordinate trainees were assigned to development and ex-post maintenance work of the above-mentioned projects and fully utilized what they learned about bridge maintenance through the project.

Negative impacts were not observed at the time of ex-post evaluation.

<Evaluation Result>

In the light above, the effectiveness/impact of the project is fair.

Achievement of Project Purpose and Overall Goal

Aim	Indicators	Results	Source				
(Project Purpose) Bridge maintenance capacity of RHD is improved.	Indicator 1: Bridge maintenance cycle is commenced by RHD.	<p><u>Status of the Achievement: Achieved (Continued)</u> (Project Completion)</p> <ul style="list-style-type: none"> 75 MTs of RHD learned bridge maintenance cycle and trained inspection, evaluation, BMS operation, planning and rehabilitation with model area (Manikganj Division). As a result, bridge maintenance cycle commenced in Manikganj Division (one division out of 65 divisions of RHD). In other divisions, a divisional training course was completed by Executive Engineers (EE). Bridge maintenance cycle across the country was prepared and it was going to commence from inspection after the rainy season. <p>(Ex-post evaluation) Refer to the Indicator 2 of the Overall Goal. Bridge maintenance cycle has been completed in some bridges.</p>	Project Completion Report				
	Indicator 2: Necessary training based on the institutional capacity development plan is conducted by Master Trainers (MT).	<p><u>Status of the Achievement: Achieved (Continued)</u> (Project Completion)</p> <ul style="list-style-type: none"> A divisional training course based on institutional capacity development plan in bridge maintenance management standard (draft) was carried out in 65 divisions of RHD by MT. (The institutional capacity development plan was updated and finalized based on the project result, and was approved during 5th Joint Coordination Committee: JCC.) <p>(Ex-post Evaluation) Refer to the technical aspects in sustainability. Although institutional development plan has not been complied fully after the project completion, MTs along with individual consultants have trained the officers and staffs of all the 65 divisions.</p>	Project Completion Report				
(Overall Goal) Bridge management under RHD is enhanced.	Indicator 1: Actual ratio of bridge inspection conducted by RHD is increased to 50%.	<p><u>Status of the Achievement: Not Achieved</u> (Ex-post Evaluation)</p> <ul style="list-style-type: none"> 8,000 bridges needed inspection, out of which only 873 bridges were put into practice by RHD from 2018 to 2020. Lack of human resource for inspection is the primary reason. <p>[Actual Ratio of Bridge Inspection Conducted by RHD]</p> <table border="1"> <tr> <td></td> <td>2018 (Actual)</td> <td>2019 (Actual)</td> <td>2020 (Actual)</td> </tr> </table>		2018 (Actual)	2019 (Actual)	2020 (Actual)	Questionnaire to RHD
	2018 (Actual)	2019 (Actual)	2020 (Actual)				

		No. of Planned Inspection	8000		
		No. of Actual Inspection	837 (According to BMS database)		
		Actual Ratio	0.1046		
Indicator 2: Bridge maintenance cycle is conducted by RHD.	<u>Status of the Achievement: Partially achieved</u> (Ex-post Evaluation) <ul style="list-style-type: none"> Bridge maintenance cycle has been completed in some bridges. Primarily routine inspection has been done. Then other steps of Bridge maintenance cycle have been followed. 				Questionnaire to RHD

3 Efficiency

Both the project period and the project cost exceeded the plan (ratios against the plan: 130%, 135%) because of combined factor. Outputs were produced as planned. Therefore, the project efficiency is fair.

4 Sustainability

<Policy Aspect>

The bridge maintenance has been recognized as a highly prioritized policy area, since the Road Master Plan (2009 – 2029), which highlights it as one of major challenges while discussing its goals, benefits, and economic implications, was released in 2009.

<Institutional/Organizational Aspect>

Bridge management is appropriately managed under the head of Bridge Management Wing (BMW) in RHD. RHD has already submitted to approving authorities re-organogram proposal to solve lack of resource and improve bridge maintenance capability, although the number of staff members for bridge management is still insufficient.

<Technical Aspect>

MTs of BMW together with local individual consultants, who assisted the technical cooperation, have provided field training to the zonal officers, circle officers and staff. As the result, over 800 bridges have been inspected by RHD internal resources. Manuals and guidelines have been leveraged widely by BMW to follow bridge management cycle. Inspectors as well as RHD officers have been trained appropriately by MTs. During the time of 2020 when such trainings have not been conducted due to COVID-19 restrictions, RHD has maintained technical levels to conduct bridge maintenance by utilizing their skills and experiences acquired at the trainings by 2019.

<Financial Aspect>

BMW has estimated bridge maintenance budget based on the inspection plan and a trend analysis using previous actual maintenance costs. Although budget size is still below BMW's expectation, a certain amount of budget has been planned.

[Budget for bridge maintenance] (Billion BDT)

2016 (Actual)	2017 (Actual)	2018 (Actual)	2019 (Actual)	2020 (Actual)	2021 (Actual)	2022 (Plan)
1,35	1,6	1,77	2.0	3.0	3.3	5.0

<Evaluation Result>

In light of the above, slight problems have been observed in terms of the institutional/organizational and financial aspects of the implementing agency. Therefore, the sustainability of the effectiveness through the project is fair.

5 Summary of the Evaluation

The project achieved the Project Purpose and partially achieved the Overall Goal to enhance bridge management under RHD, through improving bridge maintenance capacity of RHD. Regarding sustainability, although there had been slight problems in assigning the sufficient number of staff for the bridge maintenance that resulted in low inspection rate in recent years, manuals/guidelines have been leveraged widely by BMW to follow bridge management cycle and inspectors as well as RHD officers have been trained appropriately by MTs. As for efficiency, the project cost and period exceeded the plan.

Considering all of the above points, this project is evaluated to be partially satisfactory.

III. Recommendations & Lessons Learned

Recommendations for Implementing Agency:

Currently, RHD is trying to increase the inspection rate by contracting out inspection work to the private sector. Since RHD has the capability to provide training programs, RHD should extend their training programs for not only internal resources, but also for local contractors and local consultants in order to ensure sufficient number of engineers who are able to engage in the proper road and bridge maintenance works based on the cycle introduced by the project.

Also, in course of time, this training program can be included as regular/routine training program at RHD as bridge inspection and maintenance is routine activity of RHD.

In two times of overseas training taken place in 2016 and 2017 in Japan, RHD visited around many places including laboratories and companies which had researched and developed a variety of cutting-edge technologies of bridge maintenance, and then learned their usefulness through on-site exercises and in-class lectures. RHD is recommended to upgrade the Standard Technical Specifications for Bridge maintenance in order for RHD itself and local companies to disseminate and make a full use of such advanced technologies in Bangladesh.

Lessons Learned for JICA:

During project design, JICA should consider and set outputs with indicators on not only technical aspects (such as development of the manual, development of bridge maintenance system, etc.), but also institutional mechanisms for securing the necessary financial and human resources for sustainable bridge maintenance. In case where the financial and human resources are limited in an EA, JICA should support the EA to develop the prioritization system to utilize the limited resources and the alternative methods of technology transfer (e.g. use of video/e-learning which as efficiency and effectiveness with limited financial and human resources).



Joined bridge inspection training session near Ranir Bandar



Site visits at Mohosthan Bridge
(old bridge with retrofitting and new bridge)