Japanese ODA Loan

Ex-Ante Evaluation (for Japanese ODA Loan)

１．Name of the Project

Country：The People's Republic of Bangladesh
Project：Jamuna Railway Bridge Construction Project (II)
Loan Agreement：12 August, 2020

２．Background and Necessity of the Project

(1) Current State and Issues of the Development of the Railway Sector in Bangladesh

The People's Republic of Bangladesh has railway networks with a total length of 2,955 km. However, most of their facilities and equipment are outdated as they were developed during the British colonial era before 1947. Due to this deterioration of the railway infrastructure, the transportation volume and service quality of these networks have decreased and Bangladesh has been unable to fully utilize the advantages of rail transportation, such as its punctuality, ability to transport large quantities, safety and energy saving. As a result, while the share that road transportation accounts for in the transport sector as a whole in Bangladesh rapidly increased from the 1970s, that of rail transportation has gradually decreased to the point where it now only accounts for approximately 10%. In the meantime, following strong economic growth in Bangladesh and its neighboring countries, container transportation is expected to increase rapidly in the future and rail transportation, which is an efficient mode of transporting containers, is expected to play a more major role.

In the Seventh Five Year Plan (FY 2016/2017 to FY 2020/2021), the Government of Bangladesh has set economic growth and poverty reduction as its overall goals, with the strengthening of railway sector positioned as a priority item, following a policy of increasing operational efficiency and improving infrastructure. Under this policy, in the Railway Master Plan (2017) formulated by the Bangladesh Railway (hereinafter referred to as "BR"), the development agenda includes a) the promotion of container transport, b) development of an urban railway system, c) improvement of bulk transport efficiency and connectivity with road transport, and d) promotion of trade with neighboring countries such as India by contributing to international rail transportation as part of the Trans-Asian Railway.

Under the Jamuna Railway Bridge Construction Project (hereinafter referred to as "the Project"), a new dedicated railway bridge (with double dual-gauge tracks for broad- and narrow-gauge trains) will be constructed 300 m upstream from where the existing Jamuna Multipurpose Bridge (hereinafter referred to as the "Existing Bridge") crosses the Jamuna River, which flows through central Bangladesh.

The Government of Bangladesh has decided to give priority to the Project, which will contribute to international rail transport, as the section to be developed under the Project forms part of the Trans-Asian Railway, which connects to India.

(2) Japan and JICA's Policy and Operations in the Development of the Railway Sector
The JICA Country Analysis Paper for Bangladesh (March 2019) identifies "strengthening inland transport capacity with consideration to connectivity with surrounding areas" and "establishing rational and balanced modes of transport" as priority areas, while Japan's Country Assistance Policy for Bangladesh (February 2018) has set its major objective as the acceleration of economic growth, further defining initiatives in promoting efficient transportation for people and goods and eliminating regional disparities through the development of high-quality transport infrastructure. Therefore, the Project is consistent with this analysis and policy.
Additionally, the Project will also contribute to the "pursuit of economic prosperity" in the Free and Open Indo-Pacific Strategy, from the aspect of enhancing the efficiency and connectivity of the transport network with neighboring countries. Furthermore, through the construction of a dedicated railway bridge, the Project will contribute to improving the efficiency of both the domestic transport network and the network between Bangladesh and neighboring countries and to the modal shift from road to rail transport of cargo and passengers, thereby contributing to SDG 9 (build resilient infrastructure, promote sustainable industrialization and foster innovation) and SDG 13 (take urgent action to combat climate change and its impacts).
JICA's past support in the railway sector includes ODA loans for the Jamuna Railway Bridge Construction Project (Loan Agreement signed in 1994) and the Dhaka-Chittagong Railway Development Project (Loan Agreement signed in 2007).
(3) Other Donors' Activity
The major donor for the railway sector in Bangladesh is the Asian Development Bank (ADB). ADB provides support for the reforming of the railway sector, including a project for the conversion of certain sections of the railway into dual-gauge tracks as well as the privatization of container transport sector in the Bangladesh Railway (BR) and revision of its fares under the Railway Sector Investment Program (since 2007). Moreover, in recent years, the Indian government has provided support for procurement of rolling stocks and the construction of new lines and railway bridges, while the Chinese government has provided support for projects to convert multiple sections of the railway into dual-gauge tracks and to construct new lines.

3. Project Description

(1) Project Objective(s)

The objective of the Project is to meet the demand for rail transportation, expand the road capacity of the Existing Bridge and improve its sustainability and safety by constructing a new dedicated railway bridge parallel to the Existing Bridge in the basin of the Jamuna River, thereby contributing to greater efficiency in the transportation links within Bangladesh and with its neighboring countries.

(2) Project Site/Target Area

Between the Bangabandhu Setu West Station in Sirajganj District and the Bangabandhu Setu East Station in Tangail District

(3) Project Component(s)

1) Construction of the Jamuna Railway Bridge (steel through truss bridge with a length of 4.8 km and double dual-gauge tracks)

2) Construction of approach tracks (elevated bridges) on both banks and relocation of the rail tracks (7.7 km in total for both banks)

3) Related facilities such as signaling systems, relocation and repair of station buildings on both banks (Bangabandhu Setu East Station and Bangabandhu Setu West Station) and incidental facilities, etc.

4) Consulting services (F/S review, detailed design, tender assistance, construction supervision, environmental and social consideration procedures and monitoring assistance, etc.)

(4) Estimated Project Cost (Loan Amount)

Approximately 202,031 million Yen（Loan Amount：89,016 million Yen）

(5) Schedule

June 2016 - March 2025 (106 months in total). The Project will be completed when the facilities are put in place (March 2024).

(6) Project Implementation Structure

1) Borrower：The Government of the People's Republic of Bangladesh

2) Guarantor：N/A

3) Executing Agency：BR

4) Operation and Maintenance System：BR

(7) Cooperation and Sharing of Roles with Other Donors

1) Japan's Activity: N/A

2) Other Donors' Activity: N/A

(8) Environmental and Social Consideration/Poverty Reduction/Social Development

1) Environmental and Social Consideration

① Category：■A □B □C □FI

② Reason for Categorization：The Project falls into the railways and bridges sector under the JICA Guidelines for Environmental and Social Considerations (published in April 2010).

③ Environmental Permit

The Environmental Impact Assessment (EIA) report was approved by the Bangladesh Department of the Environment (hereinafter referred to as "DOE") on December 12, 2017. In Bangladesh, environmental permits must be renewed every year, and the current permission is valid until the end of November 2020.

④ Anti-Pollution Measures

Air pollution, noise, and vibrations caused by the construction work will be

minimized by implementing various measures, such as regularly sprinkling water, covering truck trays, properly managing equipment and vehicles, installing sound absorbers for construction equipment, and using low-noise heavy machinery. Impacts of wastewater and waste from worker camps and construction yards are minimized by installing septic tanks and settling basins as well as securing a storage location for waste, etc. Turbid water is avoided by using a cofferdam or silt fence. Although the railway is not expected to cause a lot of noise and vibrations after the completion of the project, afforestation will be carried in the surrounding residential area and the project site as a noise prevention measure.

⑤ Natural Environment

During this project, trees will be felled in the forest park on the west bank of the Jamuna River, but will be replanted after consultation with DOE and others. Although the target area of this project does not correspond to a sensitive area, nor in the surrounding area of such, the Jamuna River area is designated as an Important Bird Area. Impacts of the project are to be minimized by reducing the felling of trees during construction. In addition, river dolphins, which are an endangered species, inhabit the Jamuna River, so pile driving will be suspended and construction vessels stopped if one is sighted. By taking such measures, it is expected that serious negative impacts on the area can be avoided.

⑥ Social Environment

There will not be any land acquisition or resettlement during this project because it will be carried out on land owned by the executing agency and land to be handed over from the BBA. At the time of this appraisal, no residences have been confirmed in the province of the target area. On the other hand, as there were cases where compensation was paid for the social impact in relation to the chars, etc. under the Jamuna Multipurpose Bridge Project (Loan Agreement signed in 1994) efforts to confirm whether there has been any impact on residents and their livelihoods will be continued through stakeholder consultation and monitoring, which will be regularly implemented throughout this project.

⑦ Other / Monitoring

For the Project, the contractor and the BR are in charge of monitoring air quality, noise, vibration, water quality, ecosystems, etc. After the start of operations, the BR will monitor noise, ecosystems, and the impact on livelihoods.

2) Cross-Cutting Issues

The project is expected to contribute to a modal shift from road to rail transport of cargo and passengers through the construction of a railway bridge. The climate

change mitigation effect of the Project (approximate GHG emission reduction) is equivalent to about 49,171 tons/year of CO2 (estimate for 2025).

3) Gender Category: [Gender Project] GI (S) (Gender Activities Integration Project)

Activity Component(s)/Reason for Categorization:

In Bangladesh's public transportation systems, a lack of sufficient convenience for women acts as an obstacle to women's use of these systems. The Project will adopt a design that takes into account convenience for women, including the installation of toilets and prayer rooms for women at Bangabandhu Setu East Station and Bangabandhu Setu West Station, both of which are to be repaired. Consequently, this is categorized as a Gender Activities Integration Project.

(9) Other Important IssuesN/A

4. Targeted Outcomes

(1) Quantitative Effects

Performance Indicators (Operation and Effect Indicator)

Indicator	Baseline (Actual Value in 2019)	Target (2026) 【Expected value 2 years after project completion】
Volume of passenger transportation of the bridge (million man-km/day)	8.85	11.24
Volume of freight of the bridge (thousand ton-km/day)	144	1,679
Number of running train (per day) of the bridge	30.29	38.53
Maximum speed (km/h) on the Bridge	16	100
Travel time from Bangabandhu East Station to Bangabandhu West Station (minutes)	44.25	9.00

(2) Qualitative Effects

Improvement of logistics within the country and with neighboring countries by strengthening the railway capacity as well as the reduction of traffic congestion by establishing balanced modes of transportation. Improvement of rail transport safety by separating the railway portion from the existing bridge and the introduction signaling systems as well as the improvement of sustainability and safety of the existing bridge achieved through a reduction of load.

(3) Internal Rate of Return

According to the following preconditions, the Project's Economic Internal Rate of Return (EIRR) will be 14.0%. The Financial Internal Rate of Return (FIRR) will be 2.0%.

【EIRR】

Cost: Project costs and operation/maintenance costs (excluding tax)
Benefit: Reduction in time costs, vehicle operation costs and maintenance costs for existing roads, increase in safety (reduction in number of traffic accidents) and effects of reducing greenhouse gases
Project Life: 30 years

【FIRR】
Cost: Project costs and operation/maintenance costs
Benefit: Fare revenues and usage fees for laying gas pipes
Project Life: 30 years

5. External Factors and Risk Control

(1) Preconditions: N/A
(2) External Conditions: N/A

6. Lessons Learned from Past Projects

The results of the ex-post evaluation (in 2011) of the Second Mekong International Bridge Construction Project in Thailand and Laos revealed that the traffic volume predicted for the project planning stage was not achieved due to insufficient improvements to surrounding infrastructure. The lesson learned from the project is that, in the case of improvements to a broad-based transportation network, it is important to prepare a project after the improvement situations and development plans of other roads and transportation networks have been sufficiently analyzed and considered. The details of the Project were reviewed taking into account related projects based on the Broad-Based Transport and Traffic Improvement Plan in the South Asia Region because the Bangladesh government and other donors are improving railways, roads and other transportation infrastructure near the planned project area at about the same time and the circumstances of such improvements may influence the effects of the Project.

In addition, the results of the ex-post evaluation (in 1985) of the Nonthaburi and Pathumthani Bridges Construction Project in Thailand indicated that for large bridges it was necessary to review the plan during the construction work due to floods and soft ground, and extra time was required to deal with such problems. Since the target area for this Project also has soft ground, the Project's plan reflects the idea that sufficient geological survey must be conducted by consultants before a detailed design is made. In addition, extra care must be taken when finalizing the bridge design and preparing tender documents based on the results of the detailed design so that the Project will not be delayed.

7. Evaluation Results

The Project is consistent with the development issues and development policies of Bangladesh, as well as the assistance polices and analyses of the Government of Japan and JICA. Through the construction of a dedicated railway bridge, the Project will contribute to improving the efficiency of both the domestic transport network and the network between Bangladesh and neighboring countries and to the modal shift from road to rail transport of cargo and passengers, thereby contributing to SDG 9 (build resilient infrastructure, promote sustainable industrialization and foster innovation) and SDG 13 (take urgent action to combat climate change and its impacts). Therefore, the need to support the implementation of the Project is high.

8. Plan for Future Evaluation

(1) Indicators to be Used

As described in (1)-(3) of Section 4.

(2) Timing

Ex-post evaluation: Two years after the project completion

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