Japanese ODA Loan

# Ex-Ante Evaluation (for Japanese ODA Loan)

## 1. Name of the Project

Country: The People's Republic of Bangladesh

Project: Kanchpur, Meghna and Gumti 2nd Bridges Construction and Existing Bridges Rehabilitation Project (I)

Loan Agreement: March 10, 2013

Loan Amount: 28,945 million yen

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

## 2. Background and Necessity of the Project

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

In the People's Republic of Bangladesh (hereinafter called Bangladesh), with recent steady growth of the economy that maintains an annual GDP growth rate of about 6%, the cargo volume handled in the country increased about 8-fold in the 30 years from 1975 to 2005. In recent years the cargo volume has been increasing by 6-7% per year. The volume of passengers also increased about 6.5-fold in the same period. Both cargo volume and number of passengers have been increasing. The major transport modes in the country are inland transport by water, railway and road, and roads are heavily used, for more than 80% of passenger and cargo transport (2005). However, as the development of new roads is not catching up with the increasing transport volume and lack of maintenance has deteriorated existing road conditions, passenger and cargo transport is negatively affected.

(2) Development Policies for the Road Sector in Bangladesh and the Priority of the Project

The Sixth Five Year Plan (FY2011/12-2015/16) clearly states that, in the road sector of Bangladesh, a modern and efficient road transport system will play an important role in achieving the plan and Vision 2021, a midterm vision of the country, mentioning the development of 6 lanes on National Highway Route No. 1 between Dhaka and Chittagong as one of the major objectives. The National Land Transport Policy (2004) mentions that missing links of major roads would be resolved by constructing of new bridges. The Road Master Plan (2009), established on the basis of the policy, states that the improvement of National Highway Route No. 1 is essential to responding to the increase of transport demand in the next 20 years, and the master plan includes the Project. Moreover, the Bangladesh Climate Change Strategy and Action Plan (2008) requires the improvement of infrastructure to respond to the rise of river water level that may be caused by climate change. The Project is also consistent with the plan.

(3) Japan and JICA's Policy and Operations in the Road Sector of the Country

In JICA's Country Analytical Work (February 2012), "development of a national

transport network" is considered as a priority issue. Citing acceleration of economic growth as one of the priority areas, the Country Assistance Policy for Bangladesh (June 2012) states that development of transport infrastructure will be carried out to contribute to the promotion of efficient transport of passengers and cargo. The Project is in line with these analysis and policies. The major support activities in the road sector in the past include the followings.

- Loan: Jamuna Multipurpose Bridge Project (1994), Paksey Bridge Construction Project (1997), Rupsha Bridge Construction Project (2001), Eastern Bangladesh Bridge Improvement Project (2009), and Padma Multipurpose Bridge Project (2011)
- Grant aid: Meghna Bridge Construction Project (1991) and Meghna and Gumti Bridge Construction Project (1991)

Putting priority on measures for climate change in Bangladesh, Japan has actively supported Bangladesh through Climate Change Japanese ODA Loan and Program Grant Aid for Environment and Climate Change (2009).

(4) Other Donors' Activity

The major donors in the transport sector in Bangladesh including roads and bridges are JICA, the World Bank and the Asian Development Bank (ADB). ADB provides assistance for the reform of the transport sector, Dhaka-Chittagong Highway Project (a feasibility study), and the others. The Jamuna Multipurpose Bridge Project is jointly co-financed by ADB, the World Bank and JICA.

(5) Necessity of the Project

Accounting for 30% of the total population and 50% of the GDP, the economic corridor between the Dhaka Metropolitan Area and Chittagong, the second largest city, is driving the economic growth of the country. The vehicle traffic volume on National Highway Route No. 1, connecting the two cities, has sharply increased in recent years and exceeds the planned capacity by up to about 60% on Kanchpur, Meghna and Gumti Bridges on the route. Therefore, in 2008 the country started to increase the number of lanes to 8 or 4 on the entire length of National Highway Route No. 1 (road). Currently these three bridges have only 2 lanes and there is an urgent need to increase the traffic capacity (through construction of the second bridges). These bridges have long been supporting passenger and cargo transport between Dhaka and Chittagong, and severely damaged road surface is posing a problem for traffic. Moreover, there are concerns about the safety of the bridges because they do not meet the new seismic design standards that were tightened after the completion of the bridges and corrosion is progressing, and they need urgent rehabilitation and reinforcement. The Project will respond to such issues and is in line with the assistance policies of the Japanese government and JICA. Therefore, the necessity and relevance of JICA's support to the Project is high.

## 3. Project Description

(1) Project Objective(s)

The Project is to contribute to the revitalization of the economy of the whole country of Bangladesh by improving safety of existing bridges concerning bridge pier corrosion and earthquake resistance, and by satisfying increasing transport demand through rehabilitation and construction of Kanchpur Bridge (overall length 0.4 km), Meghna Bridge (0.9 km) and Gumti Bridge (1.4 km) on National Highway Route No. 1 between Dhaka and Chittagong. It is also to contribute to the adoption to climate change through the development of bridges that will meet the raised water level of major rivers.

(2) Project Site/Target Area

Narayanganj District, Munshiganj District and Comilla District, Bangladesh

(3) Project Components (Including the Procurement Method)

1) Repair of Kanchpur Bridge (overall length 0.4 km), Meghna Bridge (0.9 km) and Gumti Bridge (1.4 km) (international competitive bidding)
2) Construction of 2nd Kanchpur Bridge, 2nd Meghna Bridge, 2nd Gumti Bridge and their approachroads (international competitive bidding)
3) Installation of overloading control equipment: axle load scales (2 for each bridge), deck scales (1 for each bridge) and an inspection vehicle (1 for all bridges)
4) Consulting service (e.g., detailed design, bidding assistance and construction supervision) (shortlist method)

(4) Estimated Project Cost (Loan Amount)

Total project cost: 88,464 million yen

Current loan amount: 28,945 million yen

(5) Schedule

The project period will be from March 2013 to July 2023 (a total of 125 months). The Project will be completed at the time of service provision at the facilities (July 2021).

(6) Project Implementation Structure

1) Borrower: The Government of the People's Republic of Bangladesh
2) Executing Agency: Roads and Highways Department, Ministry of Communication (RHD)
3) Operation and Maintenance System: Same as 2)

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

1) Environmental and Social Consideration

① Category: A

Reason for Categorization: The project is likely to have significant adverse impact on the environment under the JICA guidelines for environmental and social considerations.

② Environmental Permit: The Environment Impact Assessment (EIA) Report of

the Project was approved by the Department of Environment, Ministry of Environment and Forest of Bangladesh in October 2012.

③ Anti-Pollution Measures: As it is expected that operation of construction machinery will generate coarse particles and noise during construction, such measures as water sprinkling, covers on load-carrying platforms of vehicles, installation of sound-proof sheets near houses and use of low noise heavy machinery will be taken. As for water pollution, water-shielding steel sheet pile foundation and sheet piles will prevent muddy water from flowing into rivers, and muddy water will be treated in detritus tanks before being discharged so that the standard of the country will be satisfied. All excavated soil (about 14,000 $m^3$) will be used for the construction of approach roads in the Project. The result of the bottom sediment survey conducted as part of EIA confirms that the soil does not contain heavy metal or any other harmful substance exceeding the standard.

④ Natural Environment: The project site located outside nationally and locally designated protected areas (National Reserves and Conservation Areas). The Meghna and Gumti Rivers may have river dolphins, which are a rare species, and underwater noise and vibration from pile driving and nighttime lighting may affect them. In case they are seen, pile driving and operation of construction vessels will be suspended and nighttime lighting will be limited to the construction sites. Therefore, no serious adverse impact on the natural environment is expected.

⑤ Social Environment: Although the Project will be carried out within the land owned by the executing agency and does not require land acquisition, it requires involuntary relocation of a total of 972 residents for the construction of the three bridges. The relocation will be carried out according to the regulations of the country and the Resettlement Action Plan (RAP). There was a meeting with residents during the development of the RAP, where outline of the Project, compensation, support measures, monitoring plan, complaint handling mechanism, etc., were explained. Meeting participants made requests for construction planning that will minimize relocation, provision of appropriate compensation and measures to support livelihood recovery, and asked questions about relocation schedule. No objection was made in the meeting.

⑥ Other / Monitoring: Concerning the resident relocation, the executing agency will conduct internal monitoring and external experts will also monitor the status of relocation and the status of living after relocation. As for the environment, the executing agency will monitor air quality, noise, water quality, etc. during construction and use.

⑦ Conclusion: With environmental and social measures described above, it is unlikely that the Project will cause serious adverse impact. The following points

will require attention and the implementation status will have to be checked through a progress report etc.

a) Status of residents' relocation

b) Environmental monitoring (during construction and use)

2) Promotion of Poverty Reduction: Measures to support livelihood recovery will be taken for poor illegal residents who will be relocated.

3) Promotion of Social Development: Educational activities for construction workers concerning HIV/AIDS prevention will be carried out with support from consultants.

(8) Collaboration with Other Schemes and Donors: In collaboration with ADB, JICA will support RHD for strengthening its organization system.

(9) Other Important Issues: As the Project is to construct bridges to respond to the change of the river bed altitude resulted from the increase of river flow volume caused by climate change, it will contribute to the adoption to climate change.

## 4. Targeted Outcomes

(1) Quantitative Effects

1) Performance Indicators (Operation and Effect Indicator)

| Indicator | Objective | Baseline (Actual value in 2012) | Target (2023) 【Expected value 2 years after project completion】 |
|---|---|---|---|
| Annual average traffic volume (no. of vehicles/day) | Kanchpur Bridge<br>Meghna Bridge<br>Gumti Bridge | 76,732<br>65,008<br>65,008 | 136,030<br>116,342<br>116,342 |
| Reduction of travel time (min) | 3 bridges and access roads (about 5.3 km) | 23 | 5.3 |
| Improvement of average driving speed (km/h) | Starting point of National Highway Route No. 1 to the end of Gumti Bridge | 14 | 60.9 |

2) Internal Rate of Return

Based on the conditions indicated below, the Economic Internal Rate of Return (EIRR) will be 23.8%, and the Financial Internal Rate of Return (FIRR) will be 4.9%.

【EIRR】

Cost: Project cost (tax not included)

Operation and maintenance cost

Benefit: Reduction of driving cost, time reduction, and the others.

Project Life: 25 years

【FIRR】

Cost: Project cost, operation and maintenance cost

Benefit: Toll revenue

Project Life: 25 years

(2) Qualitative Effects

Improved safety of existing bridges, revitalization of the economy of the whole country of Bangladesh, and adoption to climate change

## 5. External Factors and Risk Control

Delay in civil engineering works caused by natural disasters such as a flood

## 6. Evaluation Results and Lessons Learned from Past Projects

(1) Evaluation results of similar projects

From the result of the ex-post evaluation of the Rupsha Bridge Construction Project in Bangladesh and the others, lessons-learned was found that it is necessary to strengthen the maintenance capabilities of the executing agency for large-size bridges, to strengthen the mid- and long-term financial planning capabilities including toll setting, and to tighten overload control.

(2) Lessons for the Project

As the Project is for rehabilitation and construction of large bridges, based on the above-described lesson, we will make efforts to strengthen the bridge maintenance capabilities of the executing agency through consulting services and other activities. It has been confirmed that the maintenance cost can be covered with the current toll level. As for overload, the Ministry of Communication, the regulatory agency, has agreed that axle road scales etc. should be included as a project component to tighten control.

## 7. Plan for Future Evaluation

(1) Indicators to be Used

1) Annual average traffic volume (number of vehicles/day), reduction of travel time (minutes), improvement of driving speed (km/h)
2) Economic Internal Rate of Return (EIRR) (%), and Financial Internal Rate of Return (FIRR) (%)

(2) Timing of Next Evaluation: 2 years after the completion of the Project

END