

2006 Ex-Post Monitoring for Completed ODA Loan Projects

External Evaluator: Masakatsu Kato (IC Net, Ltd.)

Project: Bangladesh “Jamuna Multipurpose Bridge Project” (BD-P36)

Loan Outline

Loan Amount/Disbursed Amount: 21,562 million yen / 21,290 million yen

Loan Agreement: June 1994

Loan Completion: August 2000

Ex-Post Evaluation: March 2001

Executing Agency: Jamuna Multipurpose Bridge Authority (JMBA), Bangladesh

Project Objective:

By constructing a multipurpose bridge on the Jamuna River, which flows from north to south almost through the center of Bangladesh, the project aims to handle traffic demand and to correct disparities between the eastern and western regions, thereby contributing to economic development of Bangladesh.

Consultant: Ben C. Gerwick Inc. (USA), and others

Contractor: Local companies, and others

Item	At time of ex-post evaluation	At time of ex-post monitoring
<p>Effectiveness & Impact</p> <p>Effectiveness</p>	<p>(1) Traffic volume Volume of traffic crossing the river on Jamuna Bridge Overall traffic volume exceeds planned figures by 29.7% (1999).</p>	<div style="border: 2px solid black; padding: 5px; margin-bottom: 10px;"> <p>Since the traffic volume has continued to grow after the ex-post evaluation, greatly exceeding planned figures, the effectiveness has been high. The project is also considered that it has been contributing for the increased agricultural productivity in the west bank region.</p> </div> <p>(1) Traffic volume Volume of traffic crossing the river on Jamuna Bridge (table below)¹ Overall traffic volume exceeds planned figures by 80% (Actual figures exceeded forecast figures by 84% in 2005, and are expected to exceed them by 88% in 2006).</p>

¹ The source is created based on questionnaire responses (responses of JMBA), and data received during the present field survey.

Table 1: Comparison of Average Daily Traffic Volume:
Forecast at Time of Appraisal vs. Actual

Index			1998* ¹ (Project completion year)		1999		2000* ²	
Trucks* ³ (per day)	Forecast	Actual	1,093	645	1,253	891	1,365	1,361
	Achievement rate* ⁵		59.0%		71.1%		99.7%	
Buses* ⁴ (per day)	Forecast	Actual	340	660	383	825	414	1,192
	Achievement rate		194.1%		215.4%		287.9%	
Passenger cars, motorcycle s (per day)	Forecast	Actual	196	773	227	702	247	893
	Achievement rate		394.3%		309.3%		361.5%	
Total (vehicles per day)	Forecast	Actual	1,630	2,079	1,865	2,418	2,025	3,445
	Achievement rate		127.5%		129.7%		170.1%	

Source: JMBA data

- *1 Figures for the volume of general traffic from June to December
 *2 Figures from January to June
 *3 Actual figures are the total of these vehicle categories for tolls: light truck, medium truck, heavy truck.
 *4 Actual figures are the total of these vehicle categories for tolls: small bus, large bus.
 *5 Achievement rate = $\frac{\text{Actual traffic volume}}{\text{Traffic volume expectation at appraisal}}$

(2) Time to cross river
 Ferry (one way): Approximately 2.5 hours
 Waiting time to board ferry: 8 to 48 hours
 Jamuna Bridge (one way): 12 to 18 minutes

(Vehicles/day)

Index (Year)			2001		2002		2003	
Trucks	Forecast	Actual	1473	1384	1586	1537	1701	1913
	Achievement rate		94%		97%		112%	
Buses	Forecast	Actual	445	1178	477	1321	510	1476
	Achievement rate		265%		277%		289%	
Passenger cars, motorcycle s	Forecast	Actual	267	658	288	682	309	744
	Achievement rate		246%		237%		241%	
Total	Forecast	Actual	2186	3220	2352	3540	2522	4133
	Achievement rate		147.3%		150.5%		163.9%	
Index (Year)			2004		2005		2006*	
Trucks	Forecast	Actual	1820	2349	1942	2561	2039	2604
	Achievement rate		129%		132%		128%	
Buses	Forecast	Actual	544	1669	578	1818	608	1999
	Achievement rate		306%		315%		329%	
Passenger cars, motorcycle s	Forecast	Actual	331	769	354	910	372	1076
	Achievement rate		232%		257%		289%	
Total	Forecast	Actual	2696	4787	2875	5289	3019	5678
	Achievement rate		177.1%		183.9%		188.1%	

* Data for January to April

- (2) Time to cross river
- Ferry (one way): (Aricha to Nagarbari, several dozen kilometers downstream) Approximately 55 to 80 minutes (Waiting: time 10 to 20 minutes, Crossing time: 45 to 60 minutes)
 - Jamuna Bridge (one way):

(3) Crossing toll
Comparison in Jamuna Bridge tolls with ferry fares

Table 2: Comparison in ferry fare with toll to cross Jamuna Bridge

	Truck			Bus		Passenger cars, Motorcycle	
	Small	Medium	Large	Small	Large	Motor-cycle	Passenger cars
Jamuna Bridge crossing toll	750	1000	1,250	550	800	30	400
Ferry fare	705.5			1,346.7		29	290.9

* Truck: Small (below 5 tons), Medium (5 tons – 8 tons), Large (over 8 tons)
Bus: Small (29 or less seats), Large (30 or more seats)

(4) It is confirmed that river management (dike work) is appropriately maintained.

(5) Other
There are plans to add a railroad, electricity transmission lines, a gas pipeline, and telephone cables.

Average 7 minutes
(Waiting time: 0.5 minutes, crossing time: 6.5 minutes)

(3) Comparison in Jamuna Bridge tolls with ferry fares
Jamuna Bridge tolls have not changed since the time of ex-post evaluation.
Ferry fares (Aricha to Nagarbari)

Truck: 1090 takas
Bus: 1155 takas + 14 takas/passenger
Passenger cars, motorcycle: 115 takas + 14 takas/passenger
Jeep or pickup: 305 takas + 15 takas/passenger

(4) Maintenance and safety work for river control (dike work) is outsourced by the executing agency to an operation and maintenance company. Dike work is operated normally and appropriately, with river patrols, waterway measurement surveys, engineering surveys, safety management, etc.

(5) Other
Since the bridge is built for multipurposes, in addition to the road, the following were installed and began its operation after the ex-post evaluation (However, the railroad, electricity transmission lines, gas pipeline, and telephone cables were not financed by the ODA loan).
(1) Railroad – Trials began in 1999, and full operation began in 2002.
(2) Electricity transmission lines – Installation of 230kV transmission capacity completed, but actual electricity transmission has not started yet.
(3) Gas pipeline – Installation completed in 1999, and transport of natural gas began in 2002.

3) Utilization rate of electricity transmission lines laid along the bridge:
Operation planned in future.

4) Utilization rate of gas pipelines laid along the bridge:
Operation planned in future.

- (2) Related to resident relocation
- Achievement level of resident relocation plan

Table 1: RRAP Achievement Rate

Category	Item	Achievement rate (from progress report)
Unconditional compensation	• CCL payments	• 74% or greater
	• Extra 50% added to CCL payment	• 100% of CCL recipients
	• Lump sum cash compensation	• 100%
	• Cash compensation related to housing construction	• 92%
Conditional compensation	• Cash compensation related to housing relocation	• 100%
	• MARV payment	• 48% (The basis for this planned value is uncertain)
	• Stamp tax payment refund	• 48% (The basis for this planned value is uncertain)
	• Substitute site acquisition after monetary	• 93% (The basis for this planned value is

3) Electricity transmission lines – Installation is complete, but actual transmission of electricity has not started yet (It appears that a related institution will soon begin improvement work. In addition, relocated resident beneficiaries near the bridge said in interviews: “We are happy because there are fewer power outages.” However, according to executing agency sources, electricity supply to that area nearby is unrelated to the Jamuna Bridge electricity transmission lines).

4) Gas pipeline – Supply volume is 425 mmscfd (installed transport capacity (utilization rate) is 85%).

(2) Related to resident relocation
Compensation payments from resident relocation plans (Revised Resettlement Action Plan, Erosion and Flood Affected Persons) were almost finished in 1999/2000. From that time, work was done on infrastructure in the relocation destination, and training provided to relocated residents. The entire plan finished at the end of 2003. Residents are satisfied with the infrastructure improvements of the relocation destination, but some are experiencing unemployment and worse living standards.
* The following is information collected from interviews with 302 households living in the relocation areas in the east and west banks, to understand the current situation of relocated residents (there is no actual data on improvement or deterioration).

- i) Regarding the situation of housing in the relocation destination, 52% said it was “improved after relocation.” 17% said it was “worsened.”
- ii) A great majority of relocated residents welcomed improved social infrastructure and public facilities, such as water supply, sanitation facilities, access to electricity, roads, schools, and mosque facilities.
- iii) Regarding access to agricultural land, 90% of households said that ownership and access to agricultural land had worsened, and agricultural producers fell from 60% before relocation to 24% after (day labor agricultural workers increased from 7% to 11%). However, it also seemed that the farmers found alternative sources of income.
- iv) Regarding the problem of employment and income sources (livelihood), the most serious problem widely raised was the lack of employment opportunities and income sources to replace agriculture. These are general

	<ul style="list-style-type: none"> compensation (excluding relocation to prepared relocation site) • Relocation to prepared relocation site • Training for human resource development • Occupational training 	<p>uncertain)</p> <ul style="list-style-type: none"> • 85% (The basis for this planned value is uncertain) • 50% (This planned value was calculated based on the survey) • 48% (This planned value was calculated based on the survey) 		<p>problems in rural Bangladesh, but an important cause could be the loss of agricultural land through relocation, resulting in lost employment and income sources. (*According to JMBA, the lack of employment opportunity is a common phenomenon in Bangladesh. People who lost their agricultural land, particularly in the east side of the bridge, found alternative development opportunities in business, service and the other trade. Now, establishment of tourism & resort business and the O&M activities opened up these opportunities to the people, etc. On the other hand, compared to the east side, west side population suffers from lack of employment opportunities both in terms of lost agricultural land and creation of new alternative jobs. Therefore, steps can be taken by the government to further improve the employment. Initiative was taken to set up an industrial park which could create job opportunities for many of the displaced people.)</p> <p>v) Food security and cash income worsened for 43% of households after relocation (28% are gradually improving).</p>	
<p>Sustainability</p>	<p>(1) Technical capacity Three engineers from JMBA (Jamuna Multipurpose Bridge Authority) are stationed in the office of JOMAC (Jamuna Operations and Maintenance Contract) on the east bank of the Jamuna Bridge.</p>	<p>(1) Technical capacity JMBA consists of 22 engineers. Eight people received technical training from 1998-2003. It plans to train 15 people over five years from 2004. Moreover, three JMBA engineers are stationed on the east bank at Jamuna Bridge.</p>		<p>(3) Environmental impact The status of natural life, fish, insects, and animals was surveyed before and after project implementation, and serious effects on existing plants and animals were not recognized.</p>	<p>(3) Environmental impact Since various environmental programs took effect, no serious impacts on the environment have arisen.</p> <div style="border: 2px solid black; padding: 5px; margin-top: 10px;"> <p>The size of the executing agency is not changed since the time of ex-post evaluation. There were also no particular problems since operation management was contracted to a private company. The financial status also continues to be profitable. However, The function on decision-making has weakened due to reorganization in the Ministry of Communications.</p> </div>

(2) Structural organization

JMBA consists of approximately 100 staff. Many staff are from institutions related to the Ministry of Communications, and are transferred to or employed by JMBA, primarily engineers and experienced staff. For five years after bridge completion, JMBA contracted operation and maintenance to JOMAC (a multinational company formed from three companies in South Africa, England, and Bangladesh. It has a total of 352 employees). The contract period with JOMAC is scheduled to end in 2002.

(3) Financial status

JOMAC has an annual operation and maintenance contract of about US\$24 million. Toll revenues in 1999 were 597 million taka. The government decided to give priority to expenditures for the operation and maintenance budget for this bridge. There are no particular problems with budget measures.

(2) Structural organization

JMBA consists of 157 staff. Many staff are primarily engineers and experienced managers from institutions related to the Ministry of Communications, and are transferred to or employed by JMBA. During the project, JMBA was as an independent organization at the ministerial level (its head was a Secretary). However, after the project was implemented, it was lowered to the level of a department in the Ministry of Communications, which weakened JMBA's ability for decision-making, operation and maintenance. Since 2003, operation and maintenance has been contracted to Marga Net One Ltd. (300 employees).

(3) Financial status

JMBA has been managed profitably for the past five years (FY2000/01 – 2005/06) with a good cash flow. JMBA has also paid subsidies on behalf of the government since FY2004/05 (4.4 million taka in FY 2005/06).

Table JMBA Revenues and Expenses (Thousand Taka)

Fiscal year	Revenues	Expenses	Operation and maintenance costs (%) *	ODA loan payments (%) **	Balance
2000/2001	1,080,757	571,574	44	41	509,189
2001/2002	1,072,909	599,481	47	39	473,428
2002/2003	1,365,334	670,099	36	35	695,235
2003/2004	1,580,718	870,324	25	49	710,394
2004/2005	1,834,365	1,426,444	8.5	72	407,921
2005/2006	1,903,794	1,519,087	-	-	384,707

* Operation and maintenance costs divided by Expenses

** ODA loan repayments divided by Expenses

*** Expectation

Table JMBA

Toll Revenues, Operation and Maintenance Expenses

(Million Taka)

Fiscal year	Toll revenues	Operation and maintenance expenses
2000/2001	811.49	253.8

	<ul style="list-style-type: none"> • Operation and maintenance (Current status of output, and its operation and maintenance) <p>JOMAC is in charge of collecting tolls, supervising traffic, security of the surroundings, and regular maintenance of the bridge, approach road, and river dikes. If major problems arise with the facility, JMBA will directly carry out maintenance. Also, the structure includes JMBA engineers stationed at the bridge who inspect the maintenance situation, etc.</p>	<table border="1" data-bbox="1308 140 2036 308"> <tr> <td>2001/2002</td> <td>919.99</td> <td>280.9</td> </tr> <tr> <td>2002/2003</td> <td>1,070.23</td> <td>240.6</td> </tr> <tr> <td>2003/2004</td> <td>1,293.00</td> <td>221.1</td> </tr> <tr> <td>2004/2005</td> <td>1,504.34</td> <td>120.7</td> </tr> <tr> <td>2005/2006</td> <td>1,560.79</td> <td>121.0</td> </tr> </table> <ul style="list-style-type: none"> • Operation and maintenance <p>The operation and maintenance system is basically similar to that at the time of ex-post evaluation, but since 2004 JMBA has been directly in charge of maintenance work on the approach road. Some cracks were found on the bridge's deck surface at the start of 2006, which is currently investigated. Also required are the restarting operation of the freight vehicle weigh bridges (for trucks), and installation and operation of a railcar weigh bridge.</p>	2001/2002	919.99	280.9	2002/2003	1,070.23	240.6	2003/2004	1,293.00	221.1	2004/2005	1,504.34	120.7	2005/2006	1,560.79	121.0
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<p>Lessons Learned, Recommendations, Information Resources and Monitoring Methods</p> <p>(1) Follow up on lessons learned and recommendations made in the ex-post evaluation report or in later evaluations</p> <p>(2) Proposals for securing sustainability, and instructions given at time of ex-post monitoring</p>	<p>No lessons learned or recommendations were mentioned.</p>	<div data-bbox="1308 687 2040 890" style="border: 2px solid black; padding: 5px;"> <p>In large-scale infrastructure projects, it is important to consider positive and negative social and environmental impacts such as resident relocation issues from the planning stage. It is also necessary to ensure that the executing agency has sufficient technical and organizational capabilities for implementation, operation, and maintenance.</p> </div> <p>(1) Lessons at time of ex-post monitoring</p> <p>In large-scale infrastructure projects for roads or bridges, such as Jamuna Bridge (especially when associated with converting use of a huge land area), it is necessary to systematically survey and draft plans regarding the major issues of impacts on society and the natural environment during project design, then take sufficient measures, as it was done in this project. When resident relocation occurs, it is necessary to secure future means of livelihood for residents in relocation plans. For sound execution, it is also important to clarify the participatory approach based administrative and organizational framework.</p> <p>(2) Recommendations for securing sustainability</p> <ul style="list-style-type: none"> • To ensure JMBA has sufficient operation and maintenance abilities, it is important to strengthen its administrative position and decision-making authority in the Ministry of Communications, and develop specialist 															

		<p>staff able to plan and manage work from a longer-term viewpoint (minimizing employment transfers).</p> <ul style="list-style-type: none">• For the financial sustainability of JMBA, it is vital to ensure sufficient future revenues, and necessary to strengthen financial planning ability over the medium term, including setting tolls.
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