Telecommunication Network Expansion Project

Report Date: September 1999

1 Project Summary and Japan's ODA Loan

This project consists of the implementation of the following two sub-projects:

(1) Expansion of the Dhaka - Khulna Microwave System

In order to accommodate growing demand for telecommunications between Dhaka, the capital of Bangladesh, and Khulna, a major city in the west of the country, this project replaces the existing analog microwave system between the two cities (265km) with new technology digital system to expand telecommunication capacity. The new system also improves TV transmission.

(2) Expansion of the Telex System

A telex exchange with 1,360 lines is installed in eight Bangladeshi cities to meet increasing demand for telex communications in Bangladesh.

The ODA loan covered the entire foreign currency portion of the project cost.

Borrower	Government of Bangladesh
Executing Agency	Bangladesh Telegraph & Telephone Board (BTTB)
Loan Amount	¥3,420 million
Loan Disbursed Amount	¥3,214 million (including charge)
Date of Exchange of Notes	June 1985
Date of Loan Agreement	October 1985
Loan Conditions	
Interest Rate	1.25%
Repayment Period (Grace Period)	30 years (10 years)
Procurement	General Untied (Partial Untied for consulting portion)
Final Disbursement Date	December 1992

2 Analysis and Evaluation

(1) Project Scope

Regarding the microwave system expansion project, one relay station was added following the consultant review of the relay route, and the heights of the microwave towers at the Dhaka and Manikganj stations were increased to 7.6m and 10.1m respectively. Furthermore, the digital electronic exchange (TAX: Trunk Automatic Exchange) was expanded in comparison with the initial plan, to handle an increased number of circuits. These changes were made to ensure reliable microwave transmission and make effective use of telephone circuits. As such, they were appropriate modifications in line with the objectives of the project. With respect to the telex system expansion project, the number of connected cities was increased from eight to 14. Even though the demand for telex within Bangladesh is declining, there is fixed demand for telex services from banks and other institutions. Therefore the scope was flexibly modified to suit changing environment by reducing the number of lines to each city while increasing the number of cities served.

(2) Implementation Schedule

The expansion of the microwave system was delayed for 28 months beyond the initial completion schedule of March 1989, mainly due to the delay in commencement of the project. In particular, it took 27 months to reach the stage of selecting a consultant due to the re-examination of the technology to be introduced and delays in the executing agency's internal procedures. Once selected, the consultant reviewed the route and system, bringing the delay in the start of construction to 29 months. Therefore the loan disbursement period in the loan agreement was extended by 26 months. The start of procurement for the telex system expansion project was delayed by three months, but the implementation schedule went as planned, limiting the delay in completion to three months behind the initial plan.

(3) Project Cost

The cost of the foreign currency portion underran by ¥206 million, because bidding resulted in lower than anticipated procurement prices for the telecommunication equipment. The local currency portion overran by 88 million Taka, mainly due to increased customs duties. Although the rate of customs duty was reduced compared to the time the initial plan was formulated, the appreciation of Yen against Taka raised the appraised customs values, which increased the amount of Taka-based customs duties to be paid. As a result, the Taka-based payment exceeded the anticipated amount [1].

Comparison of Original Plan and Actual

Item		Plan	Actual
1.Project Scope			
i) Dhaka ~ Khulna			
Expansion of microwave system		Total length 265km	As planned
System	Telephone circuits	1 system (140MB 1,920 lines)	
	TV	1 system (140MB 32MB Codec)	
	Stand-by lines	1 system (140MB)	
	Microwave stations	7 stations	8 stations
		-	Expansion of TAX (Trunk Automatic Exchange)
		-	(Dhaka)
		-	Addition of microprocessor
ii) Expansion of telex system			
Installation of a telex exchange		of 1,360 lines (Dhaka)	As planned
Total telex line capacity		Total: 1,360 lines	
Dhaka / Chittagong		865 lines / 225 lines	870 lines / 125 lines
Khulna / Sylhet		45 lines / 45 lines	25 lines / 25 lines
Bogra / Comilla		45 lines / 45 lines	50 lines / 35 lines
Jessore / Narainganj		45 lines / 45 lines	35 lines / 45 lines
			Other 14 cities: 150 lines
2.Implementation Schedule			
i) Expansion of microwave system			
Selection of consultant		October 1985 to January 1986	October 1985 to January 1988
Procurement and installation of equipment and materials		July 1986 to March 1989	December 1988 to July 1991
Consulting services		January 1986 to March 1989	January 1990 to July 1991
ii) Expansion of telex system			

1 The appreciation of Yen against Taka produced a cost underrun of ¥1.108 billion in the total Yen-based project cost.

Procurement and installation of equipment and materials	October 1985 to March 1988	January 1986 to June 1988
3.Project Cost		
Foreign currency	¥3,420 million	¥3,214 million
Local currency	Tk.298 million	Tk.386 million
Total	¥6,252 million	¥5,144 million
Exchange Rate	1Taka = ¥9.5 (September 1985)	1Taka = ¥5.0 (1988)

(4) Project Implementation Scheme

The executing agency was Bangladesh Telegraph and Telephone Board (BTTB), under the jurisdiction of the Bangladeshi Ministry of Post and Telecommunications. A consultant was selected using a shortlist method for bidding assistance and implementation supervision. The equipment and materials were supplied by contractors selected through international competitive bidding. The start of implementation was delayed due to BTTB's internal procedures, but the contractors and consultant did not cause any delays, and there were no significant problems with their performance.

(5) Operations and Maintenance

BTTB continues to manage the facilities after the completion of the project. The operations and maintenance of the microwave facilities are handled by Microwave Maintenance Division-1 with 18 engineers working in the microwave stations. Ten engineers were trained in maintenance skills in the course of project implementation, and the system reliability is maintained at 99.99%. Thus there are no apparent problems in the maintenance situation. However, the budget allocated for maintenance expenses is less than the required amount, leading to difficulties in buying spare parts. In addition, a manufacturer of the equipment changed the model so that it could get difficult to keep a supply of spare parts in future. As a result, BTTB plans to change the systems. Telex Division of Overseas Transmission Region is responsible for operation and maintenance of the telex system. During the implementation of the project, three engineers were trained in Japan and 20 in Dhaka. Now 11 engineers are working for operations and maintenance of the system. Due to the high cost of the spare parts for the telex system, the cost of maintenance has risen 37.74% above the planned level, but appropriate budget measures have been taken and there do not appear to be any problems.

(6) Economic Evaluation

Implementation of the project to expand the microwave system increased the use of long-distance and international calls in Bangladesh, yielding revenue 32.8% higher than expected. As a result BTTB was able to raise its telephone charges by smaller margins than other public utility charges. For the telex system, the fall in revenue due to declining number of users and the rise in maintenance costs reduced revenue by 52% compared with the initial forecast.

(7) Project Effects and Impacts

(i) Utilization

The completion of the project to expand the microwave system improved the telephone circuit system and increased the use of long-distance domestic and international calls. The quality of television signals was also improved, enabling people in the rural areas to enjoy high quality picture of television. The project to expand the telex system enhanced national and international business communication. However, banks and other institutions were largely benefited by telex communications. However, in recent years due to the popularization of value-added telecommunication services such as fax and E-mail over telephone lines, the number of telex users is decreasing. BTTB plans to reduce the number of telex connections gradually and phase them out in 2005.

(ii) Financial Internal Rate of Return (FIRR)

The anticipated FIRR for this project was 15.0%, but the recalculated FIRR using actual costs and current profits is 43.5% overall, including the microwave system expansion project and the telex system expansion project. (The calculation was based on the assumption that the facilities from the telex system expansion project will be scrapped in 2005).

(iii) Other Impacts

The telephone density index (the number of telephones per 100 people) in Bangladesh has risen from 0.18 telephones in 1985 to 0.26 in 1996, and it can be inferred that this project contributed to that improvement in the telephone density. (The average density index for Asia/ Oceania is 6.59 telephones per 100 people).

3 Lessons Learned

In the light of the pace of technical innovation in the telecommunications field, the executing agency for a telecommunication project is expected to make prompt decisions on project preparation and implementation.

Introducing the latest technology (such as digitalization of telephone lines implemented in this project) should be carried out regardless of the level of development of the country concerned, but the cycle time for the latest technology in the telecommunications field is extremely short (the pace of innovation is rapid). For projects in such fields there is the risk that the technology might have to be updated in the course of the project's implementation. Therefore in the light of the pace of technical innovation in the telecommunications field, the executing agency for a telecommunications project is expected to make prompt decisions on project preparation and implementation.