

ASIAN DEVELOPMENT BANK
Operations Evaluation Department

PROJECT PERFORMANCE EVALUATION REPORT

FOR

BANGLADESH

In this electronic file, the report is followed by Management's response.



Performance Evaluation Report

Project Number: PPE: BAN 32501
Loan Number: 1666-BAN(SF)
June 2006

Bangladesh: Flood Damage Rehabilitation Project

Operations Evaluation Department

Asian Development Bank

CURRENCY EQUIVALENTS

	Currency Unit	–	taka (Tk)
	At Appraisal (October 1998)		At Project Completion (January 2002)
			At Operations Evaluation (November 2005)
Tk1.00 =	\$0.0206		\$0.0175
\$1.00 =	Tk48.50		Tk56.95
			Tk68.50

ABBREVIATIONS

ADB	–	Asian Development Bank
AP	–	affected person
BR	–	Bangladesh Railway
BRM	–	Bangladesh Resident Mission
BWDB	–	Bangladesh Water Development Board
DCC	–	Dhaka City Corporation
DFID	–	Department for International Development (United Kingdom)
DSHE	–	Department of Secondary and Higher Education
DWASA	–	Dhaka Water and Sanitation Authority
EA	–	executing agency
EIRR	–	economic internal rate of return
GDP	–	gross domestic product
IRI	–	international roughness index
JICA	–	Japan International Cooperation Agency
LGED	–	Local Government Engineering Department
NGO	–	nongovernment organization
OED	–	Operations Evaluation Department
OEM	–	Operations Evaluation Mission
PCR	–	project completion report
PSC	–	project steering committee
RHD	–	Roads and Highways Department
RRP	–	report and recommendation of the President
TA	–	technical assistance

NOTES

- (i) The fiscal year (FY) of the Government ends on 30 June.
- (ii) In this report, "\$" refers to US dollars.

Director General Director	B. Murray, Operations Evaluation Department (OED) R.B. Adhikari, Operations Evaluation Division 2, OED
Team Leader Team Members	N. Singru, Evaluation Specialist, Operations Evaluation Division 2, OED B. Palacios, Senior Evaluation Officer, Operations Evaluation Division 2, OED C. Roldan, Senior Operations Evaluation Assistant, Operations Evaluation Division 2, OED
Operations Evaluation Department, PE-684	

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The guidelines formally adopted by the Operations Evaluation Department (OED) on avoiding conflict of interest in its independent evaluations were observed in the preparation of this report. R. Fergerstrom, A. Ul Mowla, and H. Khatun were the consultants. To the knowledge of the management of OED, there were no conflicts of interest of the persons preparing, reviewing, or approving this report.

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Attachment: Management Response

BASIC DATA
Loan 1666-BAN(SF): Flood Damage Rehabilitation Project

KEY PROJECT DATA (\$ million)	As per ADB	
	Loan Documents	Actual
Total Project Cost	129.75	118.21
Foreign Exchange Cost	57.48	54.56
Local Currency Cost	72.27	63.65
ADB Loan Amount/Utilization	104.00	95.40
ADB Loan Amount/Cancellation		4.11 ¹

KEY DATES	Expected	Actual
Appraisal	1–16 Oct 1998	5–17 Oct 1998
Loan Negotiations	17–19 Nov 1998	18–20 Nov 1998
Consultation	5 Oct 1998	11 Dec 1998
Board Approval	17 Dec 1998	18 Dec 1998
Loan Agreement		22 Dec 1998
Loan Effectiveness	22 Mar 1999	1 Feb 1999
First Disbursement		23 Feb 1999
Project Completion	31 Dec 2000	29 Nov 2001
Loan Closing	30 Jun 2001	29 Jan 2002
Months (effectiveness to completion)	21	34

BORROWER People's Republic of Bangladesh

EXECUTING AGENCY

Part A: Roads and Bridges	Roads and Highways Department
Part B: Flood Control and Irrigation	Bangladesh Water Development Board (BWDB)
Part C: Rural Infrastructure	Local Government Engineering Department (LGED)
Part D: Railways	Bangladesh Railway
Part E: Urban Infrastructure	LGED, BWDB, Dhaka Water Supply and Sewerage Authority, Dhaka City Corporation, Department of Public Health Engineering
Part F: Secondary and Higher Education	Directorate of Secondary and Higher Education

MISSION DATA²

Type of Mission	No. of Missions	No. of Person-Days
Consultation	1	5
Appraisal	1	195
Project Administration		
Review	2	22
Project Completion	1	32
Operations Evaluation	1	85

ADB = Asian Development Bank.

¹ Actual loan amount plus cancellation does not add up to total loan amount at appraisal due to the fluctuations in the dollar–special drawing rights (SDR) exchange.

² Based on ADB. 2003. *Project Completion Report on the Flood Damage Rehabilitation Project in Bangladesh*. Manila, except the Operations Evaluation Mission.

EXECUTIVE SUMMARY

This report presents the findings of a project performance evaluation of the 1998 Flood Damage Rehabilitation Project in Bangladesh. An Operations Evaluation Mission (OEM) visited Bangladesh in November 2005.

Bangladesh is on the flood plains created by three major rivers—the Ganges, Brahmaputra, and Meghna—which makes the country prone to recurrent floods. The 1998 floods were unprecedented in intensity, extent, and duration. The Government requested the Asian Development Bank (ADB) for assistance to rehabilitate infrastructure and to restore normal life and activity. The Project was approved as emergency assistance to the Government of Bangladesh in the wake of unprecedented floods during July–September 1998. The Project was prepared as a response to the disaster after initial relief operations.

The Project's rationale was to enable quick economic and social recovery by restoring infrastructure to pre-flood levels. ADB had invested significantly in physical infrastructure, and this was a continuation of the development program. With the country facing frequent natural disasters, it was crucial for ADB to provide the necessary support quickly. The Project was formulated on the basis of allocating specific infrastructure sectors and flood-hit areas among the major international aid agencies for funding. It followed ADB's policy, drafted in 1995, on rehabilitation assistance after disasters.

The Project was split into various subprojects in six categories:

- (i) Part A. Rehabilitation of national, regional, and feeder roads.
- (ii) Part B. Rehabilitation of flood control and irrigation facilities.
- (iii) Part C. Rehabilitation of rural infrastructure facilities such as rural roads, bridges, and culverts.
- (iv) Part D. Rehabilitation of sections of the railway network.
- (v) Part E. Rehabilitation of urban infrastructure comprising roads, drains, culverts, and slum infrastructure.
- (vi) Part F. Repair of school buildings and provision of furniture.

The total project cost of \$118.21 million was financed out of ADB's Special Funds resources. The implementation arrangements comprised eight executing agencies for different parts, with a project steering committee coordinating them. Each part had several subprojects spread all over the country.

At project completion stage, project outputs were found to substantially conform to the project design at appraisal. Socioeconomic studies conducted by the OEM found that, in general, the project objectives of restoring key infrastructure and normal levels of livelihood activity had been met. However, the OEM also identified a few shortcomings in the project design and implementation as well as in subsequent maintenance.

The OEM's key findings are summarized as follows. While the roads rehabilitated in part A were found to be useful immediately after rehabilitation, they were inadequately maintained, causing several sections to fall into disrepair. The flood control and irrigation facilities in part B were found to be in fair condition although the "patch and mend" approach to rehabilitating them could be altered. Several sections of the rural roads in part C were found to be in poor condition, although the overall quality of roads was better than in part A because of low traffic levels combined with lighter vehicles plying the road. Part D had several procurement and implementation problems owing to Bangladesh Railway's cumbersome procedures. Although the outputs of the completed contracts were satisfactory, a few contracts were terminated because of

delays. Lack of maintenance has been a serious issue for this part. Part E subprojects relating to slum rehabilitation were difficult to locate owing to the Dhaka City Corporation's inadequate records. However, subprojects relating to urban roads rehabilitated by the Local Government Engineering Department were found to be useful immediately after completion, although they were not adequately maintained by the *pourashava* (municipal authority) that took over their operation and maintenance. Part F included several subprojects that did not satisfy project criteria. The quality of the completed works—repair of school buildings—was found to be questionable by the PCR. The OEM observed that some of these buildings were damaged and in need of urgent repairs at the time of this evaluation.

The Project witnessed small-scale resettlement involving about 213 people. Most were found in the same economic condition as before: their livelihood saw no major improvement. The affected people perceived local level corruption during the payment of resettlement compensation. The Project also experienced (i) a tendency to “patch and mend” infrastructure facilities, linked with the urgency of emergency assistance projects; (ii) inadequate maintenance of the restored facilities; (iii) atomization of funds across several small and large subprojects throughout the country, creating problems for managing procurement and implementation; and (iv) no beneficiary participation in project preparation and implementation.

The Project was based on ADB's earlier emergency assistance policy, which advocated short-term interventions without any following linked development activities. The above implementation issues could have been better addressed if the project design had been based on ADB's current policy of comprehensive disaster management approach integrated within the national development process. While the earlier policy stressed quick recovery and restoration of normal services, the current policy advocates transitional assistance combined with a medium- to long-term reconstruction effort that enables sustainability. The current policy promotes a specific disaster prevention phase highly relevant for Bangladesh, which experiences recurrent natural disasters. Since project completion, ADB has adopted a new approach for flood rehabilitation supported by the current disaster management policy. The Government has gradually developed the disaster mitigation policy by way of the Flood Action Plan, which has evolved as a holistic response integrating disaster prevention, development of early warning systems, awareness building and training, and relief.

The project performance evaluation report has lowered the overall project rating from “highly successful” at the PCR stage to “successful” at the evaluation stage to reflect issues of efficiency and sustainability.

The Project was distinctly relevant in the context of the country's needs and priorities as well as ADB's country and sector strategies. Harmonization with other development partners was effective, underlining the fact that ADB should continue along these lines. The Project is rated highly effective since it achieved the intended outcome of restoring the economic and social activities of the affected people. Adequate road conditions are integral to providing transport services and, hence, the economic life of any country. The Project restored the selected roads. It protected farms and residential areas during subsequent rainy seasons with flood protection, embankments, and irrigation works.

The Project is rated efficient given that many contracts were implemented in a reasonable time. Procurement and implementation delays provided lessons for subsequent projects, which have improved efficiency. Part F, which rehabilitated school buildings and provided furniture, is rated less efficient owing to the consultant's poor performance, which was partly responsible for the component not meeting project selection criteria.

Emergency assistance projects that use the “patch and mend” approach have problems being sustainable. The Project is rated less likely to be sustainable owing to the poor maintenance of the roads, railways, and education facilities. Flood control, irrigation, and urban and rural infrastructure were found to be in fair condition, but the tendency to construct cost-effective projects quickly, combined with the lack of propensity to maintain these works, renders them less likely to be sustainable.

Although the Project focused on achieving physical targets, i.e., restoring infrastructure, a number of socioeconomic changes can be partly attributed to it. For example, the survival of the rural brick kiln industry is heavily dependent on the quality of the roads used to transport the raw materials and finished bricks. After project completion, a number of these kilns emerged to exploit the benefits of a good road. However, because of inadequate maintenance, these roads are in disrepair, threatening the kilns’ survival.

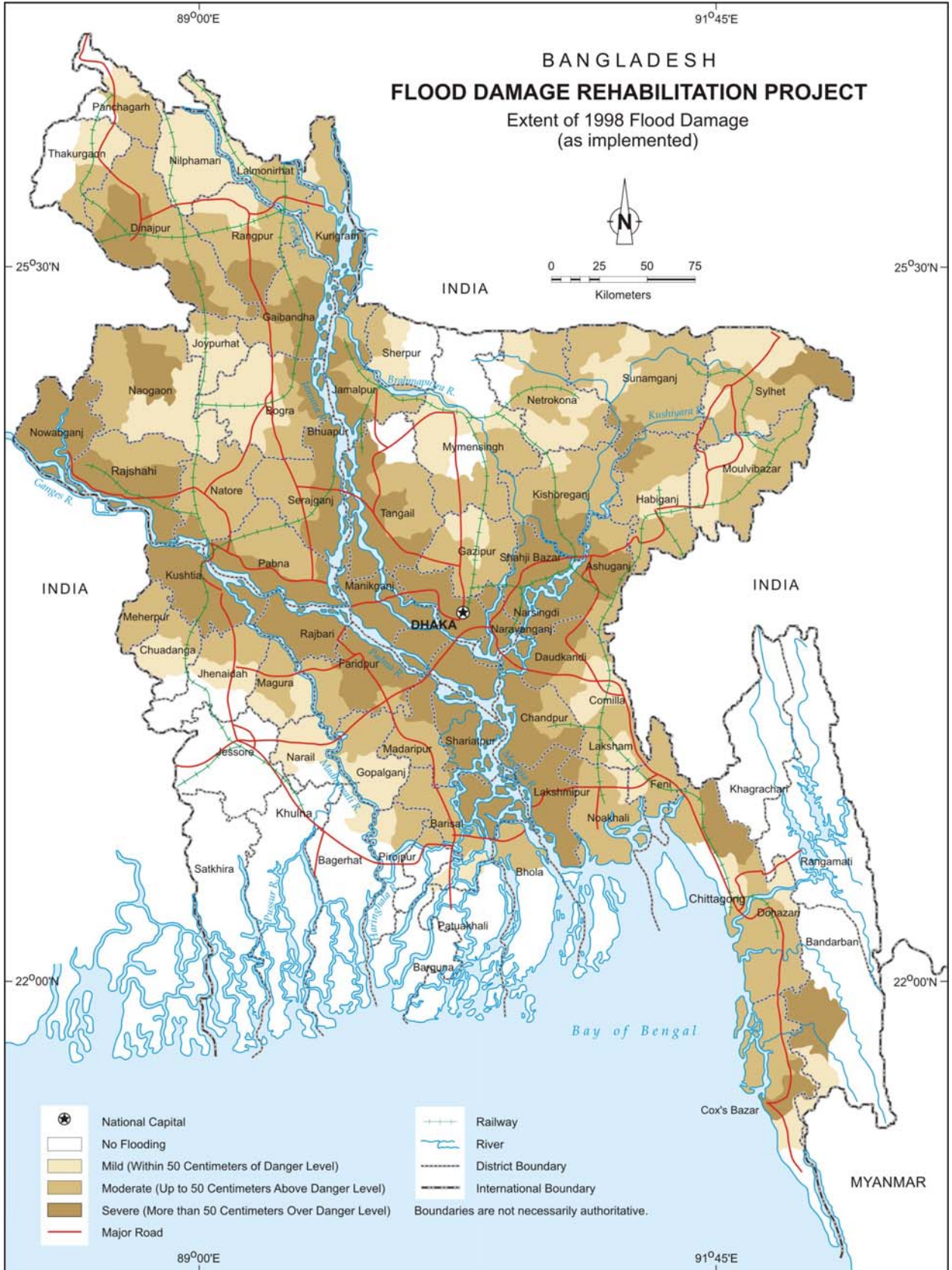
ADB’s performance was benchmarked against the World Bank’s, since both processed and implemented similar projects over similar time frames. While ADB’s overall performance was found to be satisfactory, its loan-processing time could be improved. The Borrower’s performance was also found to be wanting, although with experience this is being rectified.

Issues for the Project included the following: (i) the large number of civil works packages typical for emergency assistance projects creates severe management challenges; (ii) corruption has been a major issue, although the Government has been trying to control it; and (iii) community participation is notably absent from emergency assistance projects despite it being highlighted as an important lesson from previous loans.

Lessons from the Project include the following: (i) ADB could improve its response time by adopting standardized measures to reduce the time to process emergency loans; (ii) large contract packages need to be awarded under future projects; (iii) future ADB projects need to establish more realistic implementation schedules; (iv) the early involvement of the Bangladesh Resident Mission in project administration was effective and should be continued; (v) loan covenants requiring borrowers to insure many scattered project facilities are not practical; (vi) the short-term recovery phase needs to be linked to the long-term reconstruction phase to ensure that the projects are sustainable; where necessary, the long-term phase should involve upgrading infrastructure to make it sustainable; (vii) ADB, in conjunction with the Government, could rethink the approach to focus on key infrastructure sectors, such as transport and water, which are more capital intensive, to ensure that these projects are more effective; and (viii) the operations evaluation could be conducted within 2 years of project completion to take better advantage of institutional memories.

It is recommended that (i) the Bangladesh Railway should maintain its tracks more effectively to avoid accidents, (ii) ADB develop a specific flood rehabilitation work plan for Bangladesh to respond more quickly to such disasters as they are likely to recur, and (iii) the Government be encouraged to set up the road maintenance fund to solve the problems of routine and periodic maintenance of all roads. ADB needs to initiate policy dialogue with the Government for completing the above actions.

Bruce Murray
Director General
Operations Evaluation Department



BANGLADESH FLOOD DAMAGE REHABILITATION PROJECT

Extent of 1998 Flood Damage
(as implemented)

- | | | | |
|--|---|--|---|
| | National Capital | | Railway |
| | No Flooding | | River |
| | Mild (Within 50 Centimeters of Danger Level) | | District Boundary |
| | Moderate (Up to 50 Centimeters Above Danger Level) | | International Boundary |
| | Severe (More than 50 Centimeters Over Danger Level) | | Boundaries are not necessarily authoritative. |
| | Major Road | | |

I. INTRODUCTION

A. Evaluation Purpose and Process

1. In 1998, unprecedented floods disrupted normal life and seriously damaged infrastructure in Bangladesh. The Asian Development Bank (ADB) Flood Damage Rehabilitation Project was commissioned to reduce the problems caused by these floods. It was evaluated by ADB's Operations Evaluation Department (OED) to assess the Project's relevance, effectiveness, efficiency, and sustainability. The Operations Evaluation Mission (OEM) visited Bangladesh from 8 November to 2 December 2005, allowing almost 4 years of full operations since completion of civil works, thus providing a sufficient basis to evaluate project performance. This report was prepared by the OEM in accordance with ADB guidelines for project performance evaluation.¹

2. The evaluation draws upon a review of project documents and other relevant studies, and discussions with ADB staff members and officials of government agencies concerned with the Project. It incorporates the results of the OEM's field inspections, comprising technical inspections of a sample of project infrastructure and beneficiary consultation at selected project locations. However, the OEM found that many government officials who had participated in loan implementation, especially in the field, were no longer available for consultation.

3. A copy of the draft evaluation report was shared with the ADB departments and offices concerned and those of the Borrower and the executing agencies (EAs), and their views have been incorporated where relevant.

4. In July 2003, the project completion report (PCR)² rated the Project highly successful. It found the Project relevant, directly supporting the Government's strategy of promoting economic development by improving infrastructure, as well as ADB's 1993 country operational strategy, which aimed to reduce poverty through economic development. It considered the Project efficacious because completed subprojects achieved their principal objective of restoring infrastructure to pre-flood levels generally within the time frames established at appraisal. Although no formal economic analysis was undertaken at appraisal, the PCR concluded that the Project was efficient in achieving its outputs and purpose. It concluded that the Project's economic benefits were implicitly high since the Project restored infrastructure to original levels of productivity at relatively low cost. Economic evaluation of four selected road subprojects, conducted at the PCR stage, yielded economic internal rates of return (EIRRs) ranging from 17.9 to 64.1.

5. The PCR noted weaknesses in ensuring sustainability: the EAs could not adequately maintain the assets restored through the Project. It doubted the sustainability of road works under several parts of the Project because the Government failed to allocate adequate funds for routine, periodic, and emergency road maintenance. It considered the sustainability of riverbank protection works at risk because of inadequate design and maintenance.

6. In light of the PCR's reservations regarding sustainability, the overall rating of highly successful was apparently based on the assumption that maintenance of assets restored through the Project would meet minimum accepted standards.³

¹ ADB. 2005. *Guidelines for Preparing Performance Evaluation Reports for Public Sector Operations*. Manila.

² ADB. 2003. *Project Completion Report on the Flood Damage Rehabilitation Project in Bangladesh*. Manila (Loan 1666-BAN[SF]).

³ The PCR rated the Project relevant, efficacious, efficient, and likely to be sustainable. However, it appears that the overall rating of highly successful was based on a subjective assessment, without using an evaluation matrix.

B. Project Objectives

7. The Project's main objective was to help the Government of Bangladesh rehabilitate key infrastructure damaged by the 1998 floods, thereby enabling the restoration of normal levels of economic and social activity. The report and recommendation of the President (RRP)⁴ identified six parts or sectors of support to the Project, each with distinct expected outputs (subprojects):

- (i) **Part A.** Rehabilitation of flood-damaged national, regional, and feeder (type A) roads to their condition before the flood in three of the country's seven road zones most affected by the flood—Dhaka, Comilla, and Chittagong (except for the Chittagong Hill Tracts Circle).
- (ii) **Part B.** Rehabilitation of flood control and irrigation facilities in seven subproject areas, including repair of embankment breaches and repair or replacement of water control structures and canals.
- (iii) **Part C.** Rehabilitation of flood-damaged rural infrastructure facilities to their original condition, including feeder roads, rural roads, bridges, and culverts in the 23 districts where ADB-financed projects⁵ are ongoing.
- (iv) **Part D.** Rehabilitation of flood-damaged infrastructure and related facilities along the core railway network⁶ to the level of service before the 1998 flood, including civil works to restore embankments, tracks, buildings, and other facilities. Provision of equipment and materials required for expeditious emergency repair work.
- (v) **Part E.** Rehabilitation of roads, drains, and culverts, and other infrastructure damaged in 41 ADB-assisted municipalities and 62 other municipalities, restoration of flood protection works in Dhaka and six other towns, and restoration of drainage facilities and slum infrastructure in Dhaka.
- (vi) **Part F.** Repair of school buildings and provision of furniture for Government and government-recognized secondary and higher secondary schools and colleges and training institutes damaged by floods.

II. DESIGN AND IMPLEMENTATION

A. Formulation

8. The Project was formulated in response to floods of unprecedented extent and intensity that inundated Bangladesh for 11 weeks, from 20 July to 30 September 1998. The floods caused grave human suffering, greatly disrupted normal life and activity, and seriously damaged infrastructure. The Government requested rehabilitation assistance from ADB. ADB responded promptly by fielding a consultation mission in September 1998, followed by an appraisal mission in October 1998.

9. The Project was formulated on the basis of allocating specific infrastructure sectors and flood-hit areas among the major international aid agencies for funding. Infrastructure categories

⁴ ADB. 1998. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the People's Republic of Bangladesh for the Flood Damage Rehabilitation Project and on a Proposal to Use Loan Savings*. Manila.

⁵ Ten districts in the southwest region under ADB. 1993. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the People's Republic of Bangladesh for the Second Rural Infrastructure Development Project*. Manila (Loan 1215-BAN[SF], for \$31 million, approved in November), and 13 districts in the north and northwest regions under ADB. 1997. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the People's Republic of Bangladesh for the Third Infrastructure Development Project*. Manila (Loan 1581-BAN[SF], for \$69 million, approved in November).

⁶ The core network connects major centers of economic activity in Bangladesh. It excludes branch lines that were being prepared for closure at the time of loan appraisal.

selected by ADB were in line with the country operational strategy (COS)⁷ designed to hasten economic growth, improve living conditions of the poor, while mitigating environmental impacts. It drew attention to the challenges to implementation, and sought to incorporate lessons from six previous emergency assistance loans to Bangladesh, as well as a broader view of ADB-wide experience with rehabilitation assistance.

10. ADB sought to incorporate the following criteria in designing and implementing the Project: (i) implement the Project as quickly as possible; (ii) limit subprojects to restoring facilities to pre-flood levels and do not attempt major long-term reconstruction; (iii) keep implementation periods short and limited to one or two construction periods; (iv) have a higher degree of consultant support and ADB supervision since project implementation will burden EA staff; (v) ensure that ADB's quick response is matched by equally quick Government action; (vi) increase beneficiary participation in project preparation and implementation; (vii) consider the environmental and social aspects even though the need for rapid response may not permit a detailed review of these issues; (viii) ensure that disbursement arrangements give EAs quick and simple access to funds; (ix) carefully define the project objectives and scope; and (x) draw up criteria for subproject selection that will permit simple prioritization of subprojects and short implementation periods, and that will group them by systems rather than by civil works type.

B. Rationale

11. The Government estimated the cost of repairing the damaged physical infrastructure at \$900 million, which it could not bear alone. ADB already had significant investments in physical infrastructure in Bangladesh. The emergency assistance would place priority on repair of infrastructure that had been rehabilitated under ongoing or completed ADB-assisted projects, and would significantly contribute to restoring other infrastructure, thereby allowing the Government to maintain development programs at reasonable levels.

12. This Project is the seventh postdisaster rehabilitation project implemented in Bangladesh. With the country facing frequent natural disasters, the Government needed support to tide over the crisis. The rationale for restoring infrastructure to pre-flood levels was to enable a quick urban as well as rural economic recovery.

C. Cost, Financing, and Executing Arrangements

13. The total project cost was \$118.21 million, about \$11.54 million less than the appraisal estimate. The main cost reductions were for part A, roads and bridges (\$5.5 million), and part D, railways (\$10.2 million). Cost reductions in part A were possible because of lower-than-estimated bid prices by contractors, exchange rate fluctuations, and design modifications. However, the Roads and Highways Department (RHD) managed to complete 53 more subprojects than originally planned in part A. The Bangladesh Railway (BR) was unable to use all the funds allocated under part D because of delays in procuring equipment and materials and awarding contracts. ADB's share of the project cost amounted to \$95.4 million (\$104 million at appraisal). A comparison of actual and estimated project costs and financing is in Appendix 1.

⁷ ADB. 1993. *Country Operational Strategy for Bangladesh*. Manila.

14. Savings from other loans⁸ of \$36.13 million (up from \$33 million at appraisal) were also deployed to rehabilitate other subprojects. However, little information was made available to the OEM on how these loan savings were spent.

15. Because of the wide variety of subprojects in each part, eight EAs handled the different parts, which were coordinated by the project steering committee (PSC). The EAs' responsibilities were as follows:

- (i) part A—RHD;
- (ii) part B—Bangladesh Water Development Board (BWDB);
- (iii) part C—Local Government and Engineering Department (LGED);
- (iv) part D—BR;
- (v) part E—LGED, BWDB, Dhaka Water Supply and Sewerage Authority (DWASA), Dhaka City Corporation (DCC), Department of Public Health Engineering (DPHE);⁹ and
- (vi) part F—Directorate of Secondary and Higher Education (DSHE).

16. Considering the multisector nature of the Project, the involvement of eight EAs, and the tight schedule, close coordination was considered to be critical to the Project's success. The PSC was formed, chaired by the Member (physical infrastructure) of the Government's Planning Commission. It included representatives of the Economic Relations Division, Finance Division, Cabinet Division, Implementation Monitoring Evaluation Division, ministries, and the EAs.

17. The PCR reported good coordination among the EAs, accomplished through quarterly coordination meetings chaired by the PSC held at ADB's Bangladesh Resident Mission (BRM). The PSC effectively monitored progress, resolving issues among the EAs and ensuring timely processing of counterpart funding. The BRM played an important role, coordinating and participating in PSC meetings, and organizing frequent meetings with project directors of the individual project implementation units and their consultants.

⁸ ADB. 1990. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grant to the People's Republic of Bangladesh for the Secondary Towns Infrastructure Development Project*. Manila (Loan 1059-BAN[SF], for \$43 million, approved on 4 December [\$1.4 million]); ADB. 1991. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grant to the People's Republic of Bangladesh for the Dhaka Integrated Flood Protection Project*. Manila (Loan 1124-BAN[SF], for \$91.5 million, approved on 21 November [\$5.0 million]); ADB. 1991. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grant to the People's Republic of Bangladesh for the Northeast Minor Irrigation Project*. Manila (Loan 1125-BAN[SF], for \$73 million, approved on 21 November [\$1.3 million]); ADB. 1992. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grant to the People's Republic of Bangladesh for the Second Bhola Irrigation Project*. Manila (Loan 1159-BAN[SF], for \$39.8 million, approved on 27 February 1992 [\$4.0 million]); ADB. 1992. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the People's Republic of Bangladesh for the Secondary Towns Integrated Flood Protection Project*. Manila (Loan 1202-BAN[SF], for \$55 million, approved on 3 December [\$2.0 million]); ADB. 1992. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and a Technical Assistance Grant to the People's Republic of Bangladesh for the Second Rural Infrastructure Development Project*. Manila (Loan 1215-BAN[SF], for \$83.4 million, approved on 21 December [\$1.3 million]); ADB. 1993. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grants to the People's Republic of Bangladesh for the Second Water Supply and Sanitation Project*. Manila (Loan 1264-BAN[SF], for \$31 million, approved on 16 November [\$7.3 million]); ADB. 1993. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grants to the People's Republic of Bangladesh for the Third Natural Gas Development Project*. Manila (Loan 1293-BAN[SF], for \$107 million, approved on 21 December [\$10.0 million]); and ADB. 1995. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the People's Republic of Bangladesh for the Secondary Towns Infrastructure Development Project II*. Manila (Loan 1376-BAN[SF], for \$65 million, approved on 19 September [\$1.7 million]).

⁹ Funds were allocated to DPHE from loan savings.

D. Procurement, Scheduling, and Construction

18. **Procurement.** Civil works were procured through local competitive bidding, generally following ADB's *Procurement Guidelines*, although the actual procedures adopted deviated from them. A total of 3,358 civil works contract packages were procured: part A—341, part B—243, part C—505, part D—107, part E—2,004, and part F—158. Initially, ADB objected to the packaging of very small contracts because it allowed contractors with little experience and resources to bid. The Government's rationale was the contractors were too few to undertake large construction projects and that the breakdown of contracts would build contractors' capacity. However, after tenders were received, ADB approved the packages that were proposed by the EAs to avoid delays associated with rebidding and because bid prices were below the engineer's estimates. Procurement of equipment and materials for part D (railways) was through international competitive bidding, without using ADB's *Procurement Guidelines*. The PCR noted that all EAs, excluding RHD and LGED, followed their own standard bidding documents that did not ensure adequate transparency and equitability. The OEM was informed that all the EAs had subsequently amended their procurement procedures to bring them in line with the ADB's *Procurement Guidelines*.

19. Civil works contractors were employed by each EA through local competitive bidding. A one-envelope system was used for contracts valued under \$200,000 and a two-envelope system for contracts above this amount. Considering that most contracts were under \$200,000, with typical package size of less than \$4,000 for part E and less than \$120,000 for part A, most civil works contractors employed the one-envelope system.¹⁰ Thus, contractors were selected through proposals that included prequalification criteria as well as price in one envelope. Although this may have kept prices low, evaluators were under great pressure to select the firm that submitted the lowest bid to avoid allegations of favoritism. The combination of many small civil works packages and the use of the one-envelope system likely resulted in the selection of some unsuitable firms.¹¹ Therefore, while contract prices were low, it is debatable whether they were the least-cost ones in all cases.

20. **Scheduling.** Project implementation took 34 months, about 13 months longer than anticipated at appraisal mainly because of (i) completion of additional subprojects by RHD, (ii) unwieldy and lengthy bidding procedures of BR, and (iii) delayed tendering and awarding of contracts by DCC and DPHE. Existing procurement procedures required rebidding when bid estimates exceeded the engineer's estimate or only one bidder was responsive. With BR, the number of approvals required before contract award were excessive, causing further delays.

21. Review missions noted that fewer than the planned number of contracts were awarded during the first construction season, thereby delaying affected people's access to project benefits. On average, construction started at least 12 months after the floods had receded and the benefits of the restored infrastructure could not be made available before 18 months at the earliest. Considering the time required to procure consultants and contractors, and the weather-related delays, construction delay was unavoidable. Project planners could keep this in mind when scheduling future implementation.

22. **Construction.** The PCR stated that overall construction had been completed as per average standards of similar civil works in Bangladesh. It highlighted issues relating to poor quality of construction of the revetment and flood protection works. The common reason cited by government officials for poor quality was the need to complete the subprojects quickly and most

¹⁰ Small contracts could be justified owing to the geographical spread of small civil works and the need to complete them on time. However, the issue was whether sufficiently experienced contractors were selected for these works.

¹¹ The PCR states that some of the selected contractors lacked the experience and financial strength to mobilize the required human resources and equipment.

cost-effectively. Discussions with the project-affected people indicated that construction did not greatly disrupt their daily life.

E. Design Changes

23. Some EAs introduced variations to the contracts up to 15% of the contract amount without ADB's prior approval, as per a prior arrangement with ADB. More roads were added as a result of lower-than-expected bid prices.

24. The PCR indicates that the scope was changed, especially for the road subprojects (parts A, C, and E) because the original estimates were based on a rapid appraisal, and the detailed assessment and design were completed in parallel with implementation. This was appropriate given the nature of the Project and the need for rapid response.

F. Outputs

25. The Project's physical outputs included (i) subprojects to repair national, regional, and district roads and bridges; (ii) flood control and irrigation works; (iii) rural infrastructure; (iv) railway infrastructure, including flood protection and raising of embankments; (v) urban infrastructure; (vi) educational facilities; and (vii) procurement of equipment and materials for BR. The PCR stated that the project outputs at completion substantially conformed to the project design at appraisal. The OEM could not inspect every subproject owing to lack of time and to the absence of information on some subprojects' location. The analysis below is based on the subprojects visited by the OEM and its consultants.

26. In part A, 328 subprojects were completed, including 43 more than those targeted at appraisal. The target at appraisal was rehabilitation of about 1,953 kilometers (km) of embankments; 1,979 km of pavement on major national, regional, and feeder roads; and 746 bridges in Dhaka, Comilla, and Chittagong zones. As per the PCR, all these roads and bridges were rehabilitated. Inspection of a sample of roads in Dhaka zone¹² by the OEM revealed that 51% of the roads rehabilitated under part A were either completely damaged or in poor condition. Contract administration and quality control were perceived to have suffered in parts A, C, and E because many small contracts were spread over wide areas. These roads deteriorated prematurely primarily because of overweight vehicles and lack of maintenance. Appendix 2 summarizes the physical condition of the subprojects in the sample area.

27. The flood control and irrigation (part B) component achieved all its targeted outputs. A total of 1,147 km of flood control embankments, 584 km of canals, and 881 irrigation and flood control structures were rehabilitated. All contracts were completed within the expected time frame. The PCR reported that the quality of flood protection works rehabilitated under part B in Dinapur, Habiganj, Kurigram, and Panchagarh districts was poor and contractors were required to replace defective work.¹³ The OEM inspected flood protection works in Kishoreganj and Netrokona and rated them fair, with structural integrity intact and less than 5% erosion on the outside edge of the embankment.

28. In the rural infrastructure (part C) component, project outputs included 1,252 km of roads, 4,156 m of bridges and culverts, 294 km of embankment, 9 water-related structures, 25 km of canals, and 20 growth-center markets. All were completed on schedule. The OEM found that

¹² Sample area comprising RHD's Dhaka zone included the districts of Dhaka, Gazipur, Jamalpur, Kishoreganj, Manikganj, Munshiganj, Mymensingh, Narayanganj, Narsingdi, Netrokona, Sherpur, and Tangail.

¹³ No information is available on the quality of work at completion. BWDB did not include these subprojects in its PCR or progress report.

21% of the roads rehabilitated under part C were either completely damaged or in poor condition. Part C subprojects were in a better condition than part A subprojects mainly because part C subprojects had less traffic combined with lighter vehicles. LGED has a more comprehensive maintenance cycle for its facilities owing to the presence of qualified technical staff at the local *upazilla* (subdistrict) levels.

29. For railways (part D), outputs included 866.0 km of tracks, 30.4 km of rail embankment, 15.8 km of embankment protection using geotextiles, and 86 bridges. The PCR and the back-to-office reports of the review missions reported delays in tendering civil works contracts and procuring supplies and materials, caused by BR's unwieldy and lengthy procurement procedures, resulting in the termination of 13 contracts. Loan proceeds allocated for civil works decreased from \$13.0 million to \$6.1 million, and for materials from \$1.3 million to \$7.6 million. The civil works component was decreased because a few subprojects were cancelled.¹⁴

30. Railway flood protection works rehabilitated in Sirajganj were in fair condition. For the first time, BR used a new technique of laying concrete slabs over geotextiles and a sand base supported by toe walls. This technique has proven to be much superior to BR's earlier flood protection works, which used large concrete slabs and boulders to sustain embankments. BR is now employing this technology for new flood protection works. The OEM observed that a few of the concrete slabs were beginning to work loose and should be replaced. In some sections of Serajganj and Rajshahi, the rail tracks were upgraded to raise them above the flood water.¹⁵ The OEM found some of these sections to be in good condition, having weathered subsequent floods.

31. Near Pubail, the OEM observed that about 25% of the elastic rail clips that secure the track to sleepers were missing. They were alleged to have been properly installed during construction but subsequently stolen or came loose and have not been replaced because of lack of funding. The lack of elastic rail clips is a serious lapse in track maintenance that could lead to train accidents.

32. Urban development (part E) involved five EAs. LGED rehabilitated 1,026 km of urban roads and 62 km of culverts. About 4,966 urban families benefited from rehabilitation of drains, restoration of public sanitary latrines, replacement of public tubewells, and repair of footpaths. However, in Dhaka, DCC was unable to locate the slum rehabilitation subprojects under part E for inspection by the OEM.

33. Under part F, about 1,500 school buildings were rehabilitated. The PCR, back-to-office reports, and newspaper articles made available to the OEM referred to the EA's recommended inclusion of 65 subprojects that had not been affected by the floods. This departure from subproject selection criteria was not discovered until July 1999, when a project review mission visited the subproject sites. The review mission also observed that, on some of the subprojects, the contractor was performing deferred maintenance rather than rehabilitation. Work was so far advanced on 50 of these subprojects that it was decided that they should be completed, and only 15 were terminated. The review mission placed most of the blame on the consultant for including these subprojects and failing to inform ADB. Works included replacing flooring, plastering, repairs to leaking roofs, painting, and construction of boundary walls and latrines. The OEM inspected seven schools, and found two in poor condition, with structural defects, and only one in good condition. The poor condition of the school buildings was caused not only by poor quality of construction (as stated in the PCR) but also by poor maintenance.

¹⁴ Delay in procurement for a few subprojects resulted in their cancellation.

¹⁵ This could be perceived to be more than just restoration of the infrastructure. However, it has helped ensure that the tracks are sustainable, proving that upgrading of infrastructure is essential to ensure sustainability.

34. Table 1 summarizes the results of the technical evaluation of the completed subprojects in the sample area of Dhaka. Appendix 2 lists the facilities inspected and their current conditions. Because the subprojects were widely dispersed, the physical condition of each could not be evaluated. The problems identified in Table 1 are common to subprojects in other parts of the country.

Table 1: Technical Evaluation Survey Results

Part/ Component	Units Inspected	Description	Condition ^a							
			Good		Fair		Poor		Damaged	
			Units	%	Units	%	Units	%	Units	%
A. Roads and Bridges	299 km	AC pavement	63	21	82	27	84	28	70	23
B. Flood Control	2 sites	Embankment			2	100				
C. Rural Roads	105 km	AC pavement	38	36	45	43	12	11	10	10
D. Railways	2 sites	Rail tracks and embankment			2	100				
E. Urban Roads	26 km	AC pavement	0	0	11	42	12	46	3	12
F. Educational Facilities	7 facilities	Building	1	14	4	57	2	29		

AC = asphalt concrete, km = kilometer.

^a For roads, a rating of (i) "good" is assessed for roads without potholes and with only minor undulation; (ii) "fair" for roads with one pothole at most every 200 m and slight undulation; (iii) "poor" for roads with one to five potholes every 200 m and significant undulation, causing some discomfort for traffic movement; (iv) "damaged" for roads with more than five potholes every 200 m, causing traffic to move on sub-base or base course. Drainage structures are rated (i) "good" when complete structural integrity is observed, (ii) "fair" when 10% integrity has been lost, (iii) "poor" where more than 10% integrity is lost, and (iv) "damaged" where total integrity is lost. Flood and irrigation facilities are rated (i) "good" when no erosion is observed, (ii) "fair" when erosion outside is about 5% but the top and inside is without erosion and structural integrity does not compromise functioning; and (iii) "poor" when the structure cannot function. For railways, (i) if the trains operate at 90% or more of the optimum design speed, the subproject is "good"; (ii) if 60–80%, "fair"; and (iii) if less than 60%, "poor". Growth centers and/or educational facilities are rated (i) "good" when no structural or functional deficiency is observed and classroom furniture is in good condition and clean, (ii) "fair" when no functional deficiency is observed but require work such as painting and cleaning, and (iii) "poor" when the structure and classroom furniture need major repairs.

Source: Operations Evaluation Mission.

35. The figures show that maintenance appears to be a problem in almost all the subprojects. In some cases, poor workmanship and/or poor supervision affected the quality of construction itself, resulting in poor-quality outputs. Rehabilitating the pavement surface to restore it to pre-flood levels did not involve upgrading the road. As a result, lack of adequate design and poor maintenance, combined with subsequent floods and high usage, caused attrition of the pavement.

G. Consultants

36. Consultants were directly engaged as stipulated in the Loan Agreement, and immediately deployed, by extending the scope of existing consultant's contracts under related ADB loans. At appraisal, the Project was estimated to require a total of 130 person-months of international and 974 person-months of domestic consulting services. Actually, eight contracts for consulting services were awarded, amounting to 120.4 person-months of international and 1,109.5 person-months of domestic consulting services. A further 22 person-months of international and 158 person-months of domestic consulting services were provided out of savings from existing loans under the Project.

37. Except for parts A and F, the performance of consultants was generally satisfactory. There appears to be a striking disparity between the use of consulting services in parts A and F. Part A (RHD) required 894.0 person-months while part F (DSHE) required just 67.5 person-months. Inputs for part A could be justified since it included a large number of small construction contracts, and the sites were geographically scattered. However, part F had inadequate consultant support. Appendix 3 summarizes the consultants' performance for each component.

H. Loan Covenants

38. The Government generally complied with loan covenants. Out of the nine major covenants, the PCR noted that only one was not complied with. Section 4.05(a) of the Loan Agreement required the Borrower to provide insurance coverage of project facilities. Considering the extent of the subprojects being implemented at *upazilla* levels with different contractors, it was not practical to implement this covenant.

39. Each EA was required to submit a PCR separately. However, the Department of Public Health Engineering, DWASA, DCC, and DSHE did not submit their reports despite formal requests by ADB. One possible reason was that these departments had several small repair works that could not be identified separately since they were spread all over the country.

I. Policy Setting

40. The project design was based on ADB's Operations Manual, sections 14 and 25.¹⁶ A key feature of the policy was restoring the infrastructure to pre-flood levels using the existing base expeditiously. The policy advocated a short-term (3-year) activity focused on quick recovery and restoration of normal services. Other aspects of the policy comprised (i) community participation, (ii) coordination with other development partners, and (iii) a sector approach to project design. The Project was generally in line with this policy, although most subprojects had no community participation. While the policy did not include retroactive financing, the RRP sought a specific approval to provide it, not exceeding 10% of the loan amount.

41. ADB's Operations Manual was revised in 2004, with the current policy¹⁷ adopting a more comprehensive disaster management approach integrated within the national development process. Besides a specific disaster prevention phase, the new policy stresses distinct phases involving short-term transitional assistance and medium- to long-term rehabilitation and reconstruction. In Bangladesh, where flood disasters take place more often than in other countries, a strong case can be made for a disaster prevention phase. The OEM was given to understand that ADB's emergency assistance project¹⁸ in response to the floods in 2004 is in line with this policy. The operational procedures¹⁹ to support the new policy promote retroactive financing up to 30% of loan proceeds, thus providing more flexibility during implementation. The policy also advocates the use of regional and subregional surveillance and early warning systems to reduce the impact of floods on human life, livestock, and moveable property. However, a strong link should be developed between the short-term transitional assistance phase²⁰ and the

¹⁶ ADB. 1995. Operations Manual. Section 25: Rehabilitation Assistance After Disasters. Manila; and ADB. 1995. Operations Manual. Section 14: Use of Surplus Loan Funds. Manila.

¹⁷ ADB. 2004. Operations Manual. Section D7/BP: Disaster and Emergency Assistance. Manila.

¹⁸ ADB. 2005. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grants to the People's Republic of Bangladesh for the Emergency Flood Damage Rehabilitation Project*. Manila.

¹⁹ ADB. 2004. Operations Manual. Section D7/OP: Operational Procedures. Disaster and Emergency Assistance. Manila.

²⁰ This emergency rehabilitation project could be perceived to be part of the short-term transitional assistance.

long-term rehabilitation phase. Rehabilitation needs to include specific infrastructure upgrading to ensure that the subprojects are sustainable.

42. The Government's policy for handling such flood disasters has evolved over the years. During the late 1980s, the Government, in conjunction with its development partners, initiated the Flood Action Plan (FAP), which comprised several studies focused mainly on physical flood protection such as constructing embankments and floodwalls. The ADB-assisted Dhaka Integrated Flood Protection Project²¹ was an output of the earlier plan. However, the plan was criticized for its focus on physical protection rather than environmental and social safeguarding. Nongovernment organizations (NGOs) and the academic community saw flooding as a natural activity and supported interventions to build on local coping and adaptive strategies of the poor—flood-proofing rather than flood control²²—and influenced emergency interventions by ADB and other development partners.²³ The current ADB approach entails (i) stronger focus, with assistance given to fewer sectors; (ii) faster project preparation; (iii) provision for use of more flood-resistant design criteria; (iv) technical assistance (TA) for preventive efforts such as early-warning systems; and (v) independent project monitoring for strengthened governance.

43. The current Government policy adopts a holistic response that integrates (i) disaster prevention; (ii) development of early-warning and monitoring systems; (iii) awareness building, education, and training (of experts and citizens); and (iv) relief and reconstruction.²⁴ A part of the disaster management plan was the development of the National Water Policy in 1999, which, in turn, mandated the Water Resources Planning Organization to develop the National Water Development Plan. The plan identifies actions required to prepare for natural disasters as well as mitigate the destruction they cause. This is in line with the country strategy, which states that ADB will support public policies aimed at being better prepared for and adjusting and adapting to regular flooding, rather than intervening to alter the natural hydrology, with the exception of selective support for flood control structures in major urban centers (footnote 24).

44. Infrastructure rehabilitated under the Project might not provide the expected user benefits because of inadequate maintenance to counter this risk in the roads sector. The Government has set up a high-level committee to focus on road maintenance. The committee will establish an independent and self-supporting road fund as envisioned in the National Land Transport Policy²⁵ and has gained ministerial support to establish it. The proposal to establish the fund has yet to be presented to the council of ministers for approval, but RHD staff members and consultants said they expect this to occur in 2006. Details of how the fund will be financed and the fund proceeds distributed have yet to be finalized.

III. PERFORMANCE ASSESSMENT

A. Overall Assessment

45. The Project was successful overall, based on separate assessments of its six parts (para. 7), all of which were successful except the education component, which was rated partly successful, but in the high range.

²¹ Loan 1124-BAN(SF): *Dhaka Integrated Flood Protection Project*, for \$91.5 million, approved on 21 November 1991.

²² The concept of flood-proofing involves various activities, such as building houses and structures on flood-proof land. The objective is not to control floods but to anticipate them and prepare the community to reduce their damage.

²³ ADB's emergency assistance after the 2004 floods (footnote 17) includes assistance to enhance early-warning systems.

²⁴ ADB. 2005. *Country Strategy and Program 2006–2010: Bangladesh*. Manila.

²⁵ Government of Bangladesh. Ministry of Communications. 2003. *Report on National Land Transport Policy*. Dhaka.

46. The individual component ratings were aggregated using weightings based on the percentage of total project cost: (i) part A (roads and bridges) 39%, (ii) part B (flood control and irrigation) 13%, (iii) part C (rural infrastructure) 23%, (iv) part D (railways) 12%, (v) part E (urban infrastructure) 7%, and (vi) part F (education) 6%. The rating used four criteria: (i) relevance (20%), (ii) effectiveness (30%), (iii) efficiency (30%), and (iv) sustainability (20%). Individual criterion ratings were in whole numbers from 0 (irrelevant) to 3 (highly relevant). The overall assessment is summarized in Table 2. Further details are in Appendix 4.

Table 2: Overall Performance Assessment

Criterion	Project Component						Overall
	Part A: Roads and Bridges	Part B: Flood Control	Part C: Rural Infra- structure	Part D: Railways	Part E: Urban Infra- structure	Part F: Education	
1. Relevance	3.0	3.0	3.0	3.0	3.0	2.0	3.0
2. Effectiveness	3.0	2.0	3.0	2.0	3.0	3.0	2.7
3. Efficiency	2.0	2.0	2.0	2.0	2.0	1.0	2.0
4. Sustainability	0.7	1.0	1.0	0.7	1.0	0.7	0.8
Total Rating	2.2	2.0	2.3	1.9	2.3	1.7	2.2

Note: highly successful > 2.7, successful $1.6 \leq S \leq 2.7$, partly successful $0.8 < PS \leq 1.6$, unsuccessful < 0.8.
Source: Operations Evaluation Mission.

B. Relevance

47. The Project is rated highly relevant (Table 2). All components were rated highly relevant, except the education component, which was rated relevant. The rating takes account of (i) relevance to the country's priorities and ADB's country and sector strategies, (ii) adequacy of justification for the interventions, and (iii) how well each intervention was designed to achieve the intended outcomes and impacts. The education component was not given a highly relevant rating because some of the schools selected by the EA and its consultant had not been damaged by the 1998 flood and, in some cases, interventions selected did not meet project criteria, diminishing intended outcomes and impacts.

48. Each sector targeted was consistent with government priorities at appraisal and at evaluation. All six infrastructure types had been severely damaged by the floods, and timely rehabilitation was required to restore normal levels of economic and social activity and income, reducing the problems faced by urban and rural people. Roads were required to provide access to jobs, markets, and schools, and to transport seed and fertilizer, as well as to promote agricultural production. Flood protection works needed to be restored before the next rainy season so that recurrent flooding did not destroy crops. Schools needed to be reopened. Water supply and sanitary facilities needed to be restored, especially in Dhaka slums, where damage was severe. Railway tracks needed to be in good condition for rice and wheat to be imported.

49. At appraisal, gross domestic product (GDP) was expected to drop from an average of almost 6% in the previous 3 years to 3.3%. The agriculture sector was expected to be particularly affected, with most experts predicting negative growth. The cost of food grain was feared to increase because of limited supplies. These predictions did not materialize, as GDP growth in 1999 was 4.87%, with the agriculture sector showing slight growth at 3.24%. By 2000, when rehabilitation of the first group of project infrastructure was completed, agriculture growth was

6.92% and GDP growth improved to 5.94%.²⁶ Although these growth rates cannot be attributed solely to it, the Project can safely be assumed to have contributed to economic growth and poverty reduction by achieving expected outcomes.²⁷

50. The interventions in each sector helped achieve the outcomes in ADB's country strategy at appraisal,²⁸ including (i) promoting faster economic growth, (ii) directly helping the poor improve their living conditions, and (iii) improving and protecting the environment. These continue to be priorities in the joint strategy developed in coordination with the Department for International Development (DFID) of the United Kingdom, Japan International Cooperation Agency (JICA), and World Bank. This strategy includes empowering the poor so that all benefit from growth. The sectors selected at appraisal remain consistent with ADB's current country strategy, which includes (i) investment in rural infrastructure and irrigation; (ii) better transport infrastructure to link farms to markets, and the domestic economy to international markets; (iii) better-quality and access to education; (iv) improved urban water supply and sanitation; and (v) better urban infrastructure.²⁹

51. The education subprojects (part F) were found lacking in relevance because the repair works, including supply of furniture, were small. While education should be included in the mainframe of ADB's interventions, funds should not be diverted to such repairs, which typically form part of relief work. ADB must focus on more capital-intensive projects such as transport access and provision of adequate water supply and sanitation to ensure greater impact in the post-disaster recovery phase.³⁰ The Government should be encouraged to promote cash-for-work schemes for repairing public buildings such as schools and hospitals. NGOs have successfully used this concept for flood-proofing.³¹ The World Food Program (WFP) has implemented food-for-work programs in Bangladesh for several years for small projects.

C. Effectiveness

52. The Project is rated highly effective (Table 3). All project outcomes defined in the RRP were achieved for parts A, C, and E. Under part B (flood control and irrigation), poor construction led to premature deterioration. Under part D (railways) and part F (education), outcomes were essentially achieved, but delays in tendering caused many projects scheduled to be completed during the 1989 construction season to be delayed to the 1990 construction season. However, since most of the subprojects achieved their intended outcome of restoring normal levels of economic and social activity, the Project is rated highly effective.

53. **Roads and Bridges.** The road and bridge component achieved all its targeted outputs. People living at the project sites reported that when the floodwaters subsided, these roads were in very poor condition and some bridges had been washed away, requiring the construction of temporary detours. Temporary Bailey bridges were built, so narrow that only one vehicle at a time could pass. Project-affected people reported that truck and bus traffic was reduced significantly immediately after the floods, but by how much could not be documented because no traffic

²⁶ Asia Economic Monitor. 2006, 7 Jun. Available: <http://aric.adb.org>

²⁷ For example, the Project restored the rail link with India and thus improved the import of food grain. Specific components of the Project in Rajshahi and Sirajganj districts of Western Bangladesh enabled this restoration.

²⁸ ADB. 1993. *Country Operational Strategy 1993–1997 Bangladesh*. Manila.

²⁹ ADB. 2005. *Bangladesh: Country Strategy and Program 2006–2010*. Manila.

³⁰ Because funds are limited, priority should be given to interventions that directly restore normal economic activity after a disaster, such as restoring transport services and providing clean water. Repairing school buildings could be included as a long-term development activity.

³¹ NGO activities forming part of the Disaster Emergency Committee enabled raising of land and setting up of flood shelters (Young, Roger, and Associates. 2000. *Disasters Emergency Committee Bangladesh: 1998 Flood Appeal, An Independent Evaluation*). See para. 42 for details of the flood-proofing concept.

counts were taken. When rehabilitation projects were completed, traffic was perceived to have increased and travel times were reduced significantly. Some project-affected people, primarily those who live on district roads, reported that fares to district centers and other towns along affected sections of road increased after the 1998 flood (Box). When subprojects were completed, fares returned to pre-flood levels. The OEM's rough traffic surveys of a 299 km sample of subproject roads reveal that 60% of motorized traffic consists of trucks or buses.

Box: Impact of Road Condition on Businesses

The brick kiln is on a regional highway in the Roads and Highways Department network. It is about 8 km from Manikganj and 24 km from Hemyetpur. The Project rehabilitated 3 km of the road to Manikganj and 16 km of the road to Hemyetpur. The plant employs over 200 people, of whom about 15 are women. Most of the unskilled workers come from nearby villages, but the skilled workers, about 25, are from outside the area. The plant produces brick during the dry season, generally from November to April. During the rainy season, the focus is on marketing the brick. Coal, which is a major raw material, is imported from India and transported by truck to the kiln. Finished bricks are transported by truck to Dhaka.

The condition of the road is critical to the plant's profitability. The owner reported that he set up his plant in 2001 when the road was in good condition. The road was damaged severely in 1998 and rehabilitated using Asian Development Bank funds, encouraging several brick kilns to set up shop next to the road. However, after 2003, the road began to deteriorate and trucker's rates increased severely, making his business less profitable. After the 2004 floods, the kiln owner was obliged to sell his bricks for about 12% less than cost because none of the potential buyers was willing to bear the extra transport costs of carrying bricks to Dhaka. He said that if the road is not rehabilitated soon, he may need to shut down his business. The survey team counted more than 20 kilns along the project road facing similar problems.

Source: Operations Evaluation Mission.

54. Some of the roads inspected were in poor condition because of lack of maintenance. For example, on the Hemyetpur–Manikganj road, 30% of the pavement was damaged and the remaining sections were in poor condition. It took about 2 hours to travel the 34 km from Hemyetpur to Manikganj. After rehabilitation, when the road was in good condition, it took less than 1 hour. Users saw considerable road-user savings in vehicle operating costs besides time savings. The road and bridge sector component was, therefore, rated highly effective.

55. **Flood Control and Irrigation.** The flood control and irrigation component was rated less effective because of poor quality of riverbank protection works in Kurigram. Although the contractor was required to replace defective work, when the Project was inspected by the PCR Mission, stone blocks, rocks, and sandbags intended to deter riverbank erosion had washed away, leaving the road in danger of flooding. In Comilla, sluice gates had become ineffective since the embankments surrounding the polders were partly washed away during the 2004 floods.³² A resettlement plan was implemented on the Teesta right bank, where 156 people were affected and compensated. Most of the people who received compensation under the Project still reside in the locality. Some beneficiaries have improved their socioeconomic condition, but most are in the same condition as they were before resettlement (Appendix 5).

56. **Rural Infrastructure.** People interviewed by the OEM reported satisfaction with the subprojects. Road rehabilitation allowed them to get farm products, including vegetables and eggs, to the markets quickly and more easily. Social and economic activity, including the return of children to school, was not fully restored to pre-flood levels until the roads were rehabilitated and the bridges restored. Those who were affected by the 2004 floods said that the impact would

³² A polder is an area enclosed by an embankment with sluice gates to control the water inside the embanked area.

have been greater without the structures rehabilitated by the Project. The rural infrastructure component was, therefore, rated highly effective.

57. **Railways.** Rail transport forms the backbone of transport during floods, when the roads are washed away. During the 1998 floods as well as subsequent ones, BR was able to operate freight services on some of its key routes. It was the main conduit for importing food grain from India in the months after the 1998 flood. Some of the tracks on these routes had been frequently flooded. The Project enabled the rehabilitation of these sections. The import of food grain from India was made more effective and efficient by the rehabilitation of the tracks in Rajshahi and Serajganj. Tracks were not only rehabilitated to pre-flood levels but also upgraded in certain sections (para. 30). These sections remained operational during subsequent floods, providing access for freight transport. When there were no floods, the trains were running more slowly than normal because of inadequate maintenance, reducing the subprojects' effectiveness. Overall, this component was rated effective.

58. **Urban Development.** All works were completed as scheduled, and project-affected people reported that most facilities are still operational. Inspected infrastructure, including box culverts, drainage canals, and sluice gates, was functioning as intended and had been adequately maintained. The OEM could not specifically identify the Dhaka subprojects implemented by the DCC, since DCC did not have any records on their location. The OEM thus interviewed slum dwellers in similar areas to ascertain the arrangements for maintenance and social impact of these types of infrastructure. Project-affected people generally said that the subprojects restored their economic and social activity. However, the specific location of smaller subprojects was often unknown,³³ supporting the earlier point (para. 51) on small projects.

59. The PCR reported that the replacement of the water supply system in one town benefited about 100,000 people. Besides, the OEM supports the PCR's observation that urban roads restored normal life in the towns and urban areas. The OEM also observed that more business opportunities were restored in the southern districts, which are more urbanized than others (Appendix 5). This component was, therefore, rated highly effective.

60. **Education.** Students and teachers in the sample of seven schools said they were generally satisfied with the subprojects. Students were able to return to school after the floods. Although DSHE did not implement these subprojects efficiently, the outputs achieved the intended targets: restoration of the social and economic life of the affected people. The education component was, therefore, rated highly effective.

D. Efficiency

61. The Project is rated efficient. All the individual sector components were rated efficient except the education component, which was rated less efficient (Table 2).

62. No economic evaluation was performed at appraisal because of the Project's emergency nature and because EIRR calculations may not be possible or practical. The PCR conducted ad hoc EIRR calculations for the road sector (part A) only, using representative road sections. These calculations indicated that road investment was reasonably efficient. However, the calculations were not founded on a defined baseline data, and the without-project situation was based on

³³ Tony Beck (*Learning Lessons from Disaster Recovery: The Case of Bangladesh*, World Bank Disaster Risk Management, Working Paper Series 11, April 2005) found that out of the World Bank's \$200 million credit line, about 56% was used for construction and industrial purposes, for which there is no information available on who imported the goods (e.g., private sector or Government), for what purpose were they used, or the likely impact of these interventions.

assumptions that could be perceived to be speculative. Because these calculations were tentative and ADB's Operations Manual states that it may not be feasible for emergency assistance projects to calculate rates of return (footnote 17), the OEM did not calculate the EIRR after evaluation.

63. As infrastructure services needed to be restored immediately, conducting a feasibility study was not practical and the OEM acknowledges this. In such a situation, relying on cost-effectiveness has been found to be appropriate (footnote 19). The project documents do not provide much insight into how the least-cost solution was determined. Considering ADB's active monitoring, it is reasonable to conclude that the interventions selected were appropriate for four reasons: (i) civil works procurement procedures resulted in the selection of the lowest-priced proposal in most cases; (ii) project review missions visited many of the project sites and only once noted inappropriate interventions—where deferred maintenance of some schools was included under part F; (iii) when project-affected people were asked whether the designs were appropriate, they often cited more costly solutions such as raising of embankments and bridges and never lower-cost solutions; and (iv) projects inspected by the OEM involved repair and replacement and not upgrading.³⁴ Discussions with government officials indicated that most subprojects were designed to ensure cost- and time-effectiveness. Bridges, for example, were narrow and lacking appropriate handrails and passenger walkways. While such options could be perceived to be least-cost solutions, it is debatable whether they were sustainable (paras. 73–84).

64. A key indicator of efficiency for emergency assistance projects is the time between the receding of floodwaters and the start of construction. In almost all the subprojects, construction started at least 1 year after floodwaters had receded. Government officials said that projects funded by other development partners also have the same gestation period. Considering how long is taken for needs assessment, loan processing, procurement, and contract award, this time interval appears to be reasonable. However, it also implies that the project-affected people had to endure poor infrastructure services for an entire year, including another monsoon season. This impacted the livelihoods of the people in the flooded areas.³⁵

65. A key issue for efficiency was the large number of contracts awarded (para. 18). This required a complex monitoring mechanism, delaying implementation and affecting the quality of civil works. However, the OEM found that the project selection criteria were simple and easy to implement. Despite this, some subprojects contravened them (para. 33). The OEM was informed that this problem was rectified in the subsequent emergency assistance project in 2004.

66. Community participation in project design is part of ADB's policy for emergency assistance projects. However, the OEM found that ADB and the EAs rarely used consultative and participatory processes for such projects mainly because of time and cost constraints: it was not possible to consult the beneficiaries during project design. The project-affected people said that the subproject designs could have been amended to better meet their need for speedier road rehabilitation, pavement widening, pavement raising, among others. This issue affected the Project's efficiency and the effectiveness.

67. While people residing around the subprojects appreciated the interventions, all who were interviewed said that they were not consulted by the EAs on the nature of physical improvements required. In some cases, they believed that (i) roads were not raised sufficiently above flood

³⁴ Except for a few BR subprojects, all others involved restoration to pre-flood levels.

³⁵ Problems such as high transportation cost, poor hygiene, and low farm-gate prices were common before the infrastructure was rehabilitated.

levels; (ii) slope protection was not adequate; and (iii) boats were not able to cross under bridges during floods, limiting access to flooded areas.

68. Although the EIRRs obtained by the PCR on selected RHD roads (part A) were favorable, this component is not rated highly efficient (i) because the sample was small and might not be representative of all the subprojects; and (ii) because of the implementation issues mentioned above.

69. Under part D, the railway interventions were less productive because implementation was delayed and some of the subprojects terminated. Some of the restored sections were flooded again in 2004. The trains run at less than normal speed. However, trains on the restored sections do enable passenger and freight traffic to flow, albeit in a delayed manner.

70. The efficiency of other non-road components could not be quantified because of lack of baseline data and the nature of the subprojects. The ADB guidelines during project implementation (footnote 16) stated that the project design should be simple to hasten implementation. However, the 1998 Flood Damage Rehabilitation Project's design was complex, involving eight EAs. While this could be perceived as unavoidable, a more focused approach based on selected sectors could have improved project efficiency.

71. Parts A to E were, therefore, rated efficient.

72. Part F was rated less efficient because (i) DSHE used project funds for subprojects that did not meet project selection criteria; (ii) in some cases, subproject design included deferred maintenance and new construction, which should typically form part of normal development loans; (iii) the performance of the component's consultant was questioned by ADB review missions; the EA said it would critically assess the consultant's performance but did not; and (iv) although some projects that did not meet selection criteria were cancelled, others were allowed to continue (para. 33).

E. Sustainability

73. The Project's weakest aspects concerned sustainability. Taking into account the current condition of the subprojects (Table 1), the Project is rated less likely to be sustainable. Parts A (roads and bridges), D (railways), and F (education) were rated unlikely to be sustainable, while parts B (flood control and irrigation) and C (rural infrastructure) were rated less likely to be sustainable (Table 2). The assessment of sustainability (part E urban infrastructure) considered the likelihood that human, institutional, financial, and other resources would be sufficient to maintain the outcomes over the Project's life. This assessment was based on the condition of the subprojects inspected by the OEM and on discussions with the EAs. While it could be argued that the project designs were based on ADB's earlier disaster management policy (footnote 17), the outputs have been found to be less likely to be sustainable. Under the current policy (footnote 17), subprojects are envisaged to become more sustainable.

74. As Bangladesh suffers flooding often, a strategy should be developed to reduce the damage to infrastructure and, where possible, reduce the impact of the unavoidable consequences of flooding. The OEM noted that, in most of the project components, the physical infrastructure must be upgraded to reduce the damage from frequent flooding. The "patch and mend" approach adopted by the Government and the development partners was found to be short term and unlikely to be sustainable across all the components.

75. **Roads and Bridges.** A report by the Highway Development and Management (HDM) Circle³⁶ in RHD rates 21% of regional highways and 30% of district roads in its network in poor condition. This report shows average roughness measured by the international roughness index (IRI)³⁷ of 6.8 for regional highways and 8.0 for district roads in 2004. This is up from 4.8 and 5.9 in 2003, indicating a poor state of repair. The visual inspections of the OEM corroborate these findings, indicating that project road quality has declined steadily across the entire RHD network. Some of these roads have also experienced repeated floods. They must not just be repaired but also upgraded in terms of (i) flood protection, (ii) better surface quality, and (iii) raising the road level above the usual flood levels.

76. Part A is rated unlikely to be sustainable. In its Road Network Rehabilitation Needs Report, RHD estimates that, from FY2006 to FY2010, an average of Tk7,781 million (\$113 million) per year will be needed to restore the existing network (address deferred maintenance needs) and to perform periodic maintenance. This compares with a budget of Tk5,270 million (\$78 million) allocated in FY2005.³⁸ About two thirds of this budget (\$49 million) are from loans and grants from bilateral donors.³⁹ If the road fund (para. 44) is established, the rating could be improved to likely to be sustainable or less likely to be sustainable, depending on the revenue generated and how the funds are managed and distributed.

77. Business people said that profits fall severely when roads are poor, and business ventures are abandoned and jobs lost. A case study of the impact of road condition on the brick manufacturing industry illustrates this point (Box).

78. **Flood Control and Irrigation.** Although riverbank protection works in Kurigram are reported to be poor, irrigation works in Kishoreganj and Netrokona districts were found to be fair (Table 1). However, water flow regulators and sluice gates had not been properly maintained, causing water to flood rice paddies during the rainy season and critically needed water to leak during the dry season. The subprojects in Comilla were in similar condition, and in some cases, the embankments protecting the polders had been partly washed away. Embankments were often damaged because they are made of earth. BWDB typically adopts a “patch and mend” approach to rehabilitating flood protection works. The use of earthen embankments is cost-effective in terms of keeping within the budget, but not sustainable. BWDB officials in Comilla reported that such earthen embankments were much cheaper than concrete reinforced embankments, which can withstand floods. However, the cost prevented them from flood-proofing the embankments.

79. Local BWDB officials said they had been encouraging the villagers to contribute cash and kind to maintain the embankments and sluice gates around the polders. However, the villagers interviewed opposed this idea because they were poor. BWDB could develop a maintenance regime based on a cost-sharing mechanism in conjunction with the villagers. This will require a systematic approach based on pilot-testing. ADB recently started a project⁴⁰ that encourages setting up water management associations (WMAs) to manage sustainable operation and maintenance of water-related infrastructure. The National Water Policy 1999 and the 2002 BWDB Act have promulgated the “joint management” concept of flood management infrastructure, where

³⁶ Roads and Highways Department, Ministry of Communications. 2005. *Road Network Maintenance and Rehabilitation Needs Report 2005–2006*. HDM Circle. Dhaka.

³⁷ IRI is the principal method used to measure road pavement roughness and to relate it to riding comfort. An IRI of 2.5 is smooth, while at above 8.0 the road is nearly impassable except at reduced speeds.

³⁸ Unofficial figures provided by RHD.

³⁹ JICA \$29 million and DFID \$20 million.

⁴⁰ ADB. 2005. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the People's Republic of Bangladesh for the Southwest Area Integrated Water Resources Planning and Management Project*. Manila (Loan 2200-BAN[SF], for \$20 million, approved on 23 November).

BWDB is responsible for periodic and emergency maintenance, and local WMAs for minor routine maintenance. However, the OEM found a lack of progress in implementing the policy, including forming effective WMAs. The OEM was informed that recent loans (2200-BAN and 1831-BAN) will attempt to correct this.

80. Despite the above issues, a better rating of less likely to be sustainable was given because (i) project-affected people said that the riverbank protection works mitigate the impact of floods, and facilities damaged by floods are generally repaired; and (ii) BWDB staff members reported that, despite insufficient funds, they are able to perform basic repairs to embankments and irrigation works.

81. **Rural Infrastructure.** A rating of less likely to be sustainable was assessed based on the following considerations. Rural infrastructure was found to be in generally fair to good condition because rural infrastructure rehabilitated through the Project, mostly roads, is less used and requires less maintenance than major highways. Using local technical staff, LGED periodically surveys roughness levels, enabling a systematic database for road maintenance. However, providing adequate funding remains a problem. LGED targets maintaining these roads once every 4 years on average. Thus, 25% of the paved roads need to be covered each year. However, funding allows for periodic maintenance of only about 10% each year—a 10-year rather than 4-year cycle. As development partners participate more in maintaining rural roads, this gap could be reduced.⁴¹

82. **Railways.** Although railway infrastructure was found to be in fair condition, it lacked maintenance (para. 30 and Table 1). For example, slope protection works in Sirajganj were effective, but a few concrete blocks were beginning to work loose and funding was not available to repair them. The local BR official stated that their repair would be funded through another existing loan. Other engineers confirmed that the only alternative was to use external funding. A rating of unlikely to be sustainable was given for these reasons.

83. **Urban Infrastructure.** Taking into account the general issues and performance of the sector, this component was rated less likely to be sustainable. However, the five EAs' performance was not uniform. Flood protection works under DWASA, such as sluice gates, box culverts, and drainage channels, were in operating condition although they needed cyclic maintenance. DCC could not locate any of the slum infrastructure works restored under the loan. Although urban roads were completed on time by LGED, almost 55% of the roads inspected were poor or damaged (Table 1) largely because they were not maintained. In most cases, LGED was involved in rehabilitating the roads. The *pourashava* (municipal authority) took over their maintenance but had limited funds.

84. **Educational Facilities.** Almost 30% of the structures were found to be in poor condition (Table 1). The PCR indicated that the quality of the restoration of the school building might have been poor. Combined with a general lack of maintenance, this could be attributed to the current condition of the structures. A rating of unlikely to be sustainable was thus appropriate.

⁴¹ The OEM was informed that ADB initiated a loan (ADB. 2002. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the People's Republic of Bangladesh for the Rural Infrastructure Improvement Project*. Manila [Loan 1952-BAN(SF), for \$60 million, approved on 2 December 2002]), which contains a capacity-building component to maintain rural infrastructure.

IV. OTHER ASSESSMENTS

A. Impact

1. Assessment of Impact

a. Impact on Institutions

85. Considering the Project's emergency nature and that each EA had experience with implementing and maintaining ADB-assisted projects, no provision was made for institutional strengthening.

86. The Project was focused on achieving the physical targets—restoration of infrastructure. Institutional development was not a consideration for two reasons. First, the urgency of emergency rehabilitation relieved the implementation agencies of institutional development considerations. Second, the lack of local resources, caused by cost-cutting measures, resulted in centralization of activities and decision-making responsibilities. The OEM was given to understand that ADB, along with other development partners, has included capacity-building components in its other projects to address these issues.

b. Socioeconomic Impact

87. The subproject yielded a continuous stream of economic and social benefits that has justified the rehabilitation effort. However, not all benefits can be attributed to ADB-financed subprojects since numerous other programs are supported by other aid agencies, the Government, and NGOs. To understand this impact, the OEM conducted a socioeconomic survey on a sample area comprising broadly defined zones based on the physiographic condition or land level. The low-lying northern districts—Jamalpur, Netrokona, Sherpur, and parts of Kishoreganj and Mymensingh—are flooded almost every year. The mid-level zone—Tangail, Gazipur, and parts of Dhaka and Narsingdi—are usually less-severely affected. The southern districts of Munshiganj, Narayanganj, and Manikganj are higher but flooded every year, although less severely. The 1998 floods affected all three zones and water levels remained high for longer than normal, disrupting livelihoods. Since it took about a year for ADB-funded subprojects to begin construction, few people could distinguish them from periodic maintenance work normally performed with government funds. However, in general, the project-affected people said that the interventions after the 1998 flood helped them restore their means of livelihood.

88. During flood relief, many economic activities were carried out by waterborne transport. Many people took shelter on elevated ground, including road and rail embankments and school buildings. They received help from the Government and NGOs as well as from more affluent or less-affected people in the community. Those with less savings resorted to providing boat ferry services to complement their livelihoods. Most farmers reported that, after a flood, relief support should include seeds and seedlings so that they could resume their livelihood as quickly as possible.

89. The subprojects have been mainly physical infrastructure interventions, designed to trigger broad economic growth. Secondary data indicate that such growth does lead to improved livelihoods and reduced poverty.⁴² People affected by the floods perceived the following impacts

⁴² Ali, Ifzal, and Ernesto Pernia. 2003. *Infrastructure and Poverty Reduction—What is the Connection?* ERD Policy Brief Series 13. Manila: ADB.

of the subprojects: (i) enhanced socioeconomic status of the affected people, (ii) enhanced importance of the locality, (iii) better business opportunities, (iv) increased land values, (iv) improved transportation, and (v) better access to educational facilities. These perceptions were broadly consistent across the country.

90. About 65% of the people said that they could recover from the flood in less than 1 year, 25% said they needed 2 years, and 10% said 3 years or more. Recovery times were relatively longer in the northern and southern zones, as compared to mid-level zone.

91. Rural women said they faced sanitary problems during and after the floods because sanitary latrines and tubewells were inundated. Tubewells were contaminated with arsenic, although this happens even when there are no floods. Some tubewells were submerged, requiring women to walk long distances to wells above the floodwater. Since women are generally responsible for cooking, securing food during floods is their responsibility, burdening them even more. Most of the women confirmed that tubewells need to be elevated to ensure uninterrupted water supply during floods.

92. The garment industry is heavily dependent on roads to transport the finished products. During the 1998 floods, some factories could not fulfill their export commitments because of lack of access to the nearest port, while some managed to fulfill part of their commitments by using water transport. Upgrading the roads to a flood-proof level has been perceived to be crucial for those industries to continue operating in a sustained manner.

93. Smaller businesses suffered immediately after the floods and also when the rehabilitated roads began to deteriorate because of lack of maintenance. Businesses such as brick kilns, which require transport of bulky items, and transport operators, who depend on the quality of roads, were directly affected (Box).

94. **Traffic Surveys.** Traffic composition surveys determined general trends. Trucks and buses accounted for about 36% of the traffic on roads rehabilitated under part A and 18% of urban roads rehabilitated under part E. Many of the trucks were overloaded two-axle vehicles, which may account for the high rate of deterioration of project roads. On rural roads rehabilitated under part C, only about 6% of the vehicles were trucks or buses, causing less damage to the pavement. Appendix 2 contains the survey results.

95. Road subprojects represented an estimated 65% of the total project cost. They had two main socioeconomic impacts: (i) immediate—improved transport for communities directly served by the road, and (ii) indirect—for a wider catchment area because the Project contributed to economic growth. Besides logistic compulsions, the road's condition was a major factor in determining traffic. Small-business owners around the subprojects said that they would be willing to use a longer route to transport their commodities if it had better road conditions.

96. **Resettlement of Project-Affected People.** The 1998 Flood Damage Rehabilitation Project required resettlement of project-affected people on the right bank of the Teesta river in Nilphamari district in northern Bangladesh. A review of documentation and consultation with project-affected people revealed that, in general, the resettlement plan was satisfactorily implemented. People were consulted during plan design, and 62 households were identified on the right-of-way to be rehabilitated. During implementation, many households affected by the 1998 flood moved to areas adjacent to the right-of-way because (i) the existing embankment was on higher ground and their low-lying land had been washed away by the flood; (ii) their agricultural land was near the main village, making it a more desirable place to reside; and (iii) the people thought that the planned resettlement would provide some benefits. Ultimately, 213

people identified by BWDB were compensated. Payment to the remaining project-affected people was withheld mainly because they could not produce the documents to prove land ownership. In general, the resettlement was implemented in line with ADB's guidelines.

97. The OEM interviewed some of the resettled families. Most of the compensated people still live in the locality, within and outside the embankment. Although some have improved their livelihood, most are in the same condition as before the flood. The beneficiaries were generally satisfied with the activities carried out by the NGO (Christian Commission for Development in Bangladesh) but dissatisfied with the performance of local government officials (see Appendix 5 for further details).

c. Environmental Impact

98. Since the Project's objective was to restore the infrastructure to pre-flood levels, the subprojects were not expected to create any specific environmental impact. During the site visits, the OEM did not observe any significant change in this perspective.

B. ADB Performance

99. ADB satisfactorily helped the Government process the loan in the shortest possible time. The project design took into account the lessons learned from ADB loans to Bangladesh and other countries for post-disaster rehabilitation (para. 10). Subproject formulation and approval arrangements were in general satisfactory (paras. 8–9). A key indicator of ADB's performance in loan processing is the time between the appraisal mission and the date of loan effectiveness: in this case, 15 weeks.⁴³ However, the World Bank appraised a similar project at the same time and made its loan effective within 5 weeks.⁴⁴ One way that ADB could shorten its loan-processing time is by developing a work plan for responding to disasters in Bangladesh specifically. Since flood disasters are fairly regular and at predictable locations, it would be prudent to determine specific sectors where ADB could get involved and develop a work plan based on a quick-response mechanism at BRM. This could be developed in consultation with the Government and the other development partners.

100. ADB's performance during project implementation was also satisfactory. Project administration was delegated to BRM on 3 February 1999, 2 days after the loan was declared effective. Timely involvement of BRM in project supervision allowed starting the project works on schedule. Advance action agreed by ADB for (i) procurement of equipment and materials, (ii) recruitment of consultants, and (iii) provision for retroactive financing was effective and saved time. The simplified approval procedures for contract award recommended by ADB were realistic for the Project as they involved emergency disaster rehabilitation works. ADB effectively coordinated the Project through the PSC's monthly meetings at BRM with the EAs' project directors. BRM was pivotal with respect to (i) contract packaging, (ii) timely approval of award of contracts, (iii) quick disbursement of funds, (iv) reallocation of funds, (v) approval of variation orders, and (vi) time extension of civil works contracts. ADB fielded three project review missions during implementation.

101. Implementation could be further benchmarked against the following two indicators:

⁴³ The PCR notes that the Appraisal Mission was completed on 17 October 1998, and the actual date of loan effectiveness was 1 February 1999.

⁴⁴ The World Bank's implementation completion report for the Emergency Flood Recovery Project (Credit 31440-BA for \$200 million) stated the appraisal date as 24 October 1998 and the actual date of loan effectiveness as 4 December 1998.

- (i) loan disbursement time—time between the date of loan effectiveness and the closing date, and
- (ii) percentage of loan amount disbursed.

102. The loan disbursement time was close to 3 years, in line with the ADB policy requiring rehabilitation loans to be closed within 3 years. However, the World Bank loan was closed within 20 months. One reason could be that the World Bank loan (footnote 44) was used mainly to import food grain and machinery, which takes less time than infrastructure rehabilitation. As regards percentage of loan amount disbursed, 91% of ADB loan was disbursed, indicating that about \$8.6 million could not be used. This is lower than for other loans for similar projects.⁴⁵

103. The OEM notes that while the loan-processing time (para. 99) is mainly within ADB's sphere of control, the other two indicators (paras. 101–102) are functions of the performance of both the Government as well as ADB.

C. Borrower Performance

104. The Borrower's performance during implementation was satisfactory. The PSC brought together all the disparate parts of the Government as well as the development partners. Despite considerable difficulties faced by BR, DSHE, DWASA, and DCC, the Project was completed successfully. Helped by the consultants, the EAs selected subprojects, applying criteria agreed to at appraisal. The OEM noted problems with subproject selection in component F (para. 33). Consultants were recruited on time. There were only minor delays in subproject selection, approval, and design. There was some delay in contract award for civil works, and some subprojects were cancelled (paras. 29 and 33). Subprojects were generally too small, involved small contractor firms, resulting in compromised quality. Implementation was also marred by the lack of community participation in engineering decisions.

105. Borrower performance after project completion has been less than satisfactory. Although government ownership was high during implementation, some subprojects were unlikely to be sustainable, thus unable to provide the anticipated benefits. The main reason for this was inadequate maintenance by the EAs.

106. The development community generally agrees that frequent flooding is unavoidable and that attempts to control floods are at best futile. The Government and the development partners have realized this and are trying to promote flood-proofing (para. 42). At the same time, a regional effort is needed to improve the management of the Ganges, Brahmaputra, and Meghna rivers, including regular exchange of key data and information on flood and water levels. The OEM was given to understand that a multilateral river commission comprising Bangladesh, Bhutan, People's Republic of China, India, and Nepal is on the anvil to improve transboundary river management. Such regional coordination efforts could help reduce the severe impacts of the floods.

D. Technical Assistance

107. TA was not provided for loan preparation or for implementation. Considering the number of subprojects and the diversity of the EAs, a TA would have been useful to help (i) build national and regional capacity for emergency surveillance, preparedness, mitigation, and prevention

⁴⁵ ADB. 2000. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Proposal to Use Loan Savings to the Kingdom of Cambodia for the Emergency Flood Rehabilitation Project*. Manila (Loan 1824-CAM[SF]) utilized 99.6% of the loan allocation. World Bank. 2000. *Emergency Flood Recovery Project*. Washington, DC (Credit 31440-BA for \$200 million) utilized 99.8% of the credit amount.

linked to an emergency assistance loan; (ii) prepare an interim operational strategy; and (iii) prepare emergency assistance programs and/or projects. The ADB policy (OM Section D7/BP) includes the TA as an instrument for emergency assistance during recovery from floods and such natural disasters.

V. ISSUES, LESSONS, AND FOLLOW-UP ACTIONS

A. Issues

108. The OEM found it difficult to locate several subprojects financed by ADB because 3,358 civil works packages were spread all over the country. The absence of records appears to be inevitable with emergency assistance projects and other development partners have also faced this problem.⁴⁶ However, a better project management system could be developed for such projects.

109. Corruption continues to hamper project implementation in Bangladesh. Discussions with people affected by resettlement (para. 97) indicated that corruption at local government levels had a bearing on payment of compensation. The OEM was informed that some local businessmen influenced local government officials to delay the rehabilitation projects so that the businessmen could continue to charge higher prices for their goods. To tackle corruption, the Government has initiated a national integrity strategy and set up the Anticorruption Commission (ACC). It remains to be seen how effective will the ACC be. The ACC could be encouraged to conduct random checks on projects, especially when resettlement is a major activity.

110. Community participation is notably absent from emergency assistance projects although previous emergency assistance loans have shown that is essential. The EAs perceived that lack of time and resources prevented the views of the project-affected people from being considered. This can be debated, and the EAs could be encouraged to undertake at least participatory planning when they prioritize such projects.

B. Lessons

111. Response time appears to be a key aspect of effective emergency assistance. ADB appraisal required 15 weeks after the appraisal mission to make the loan effective. While it is noted that this is the shortest practical time, future appraisals could look at standardizing measures to trim this down further. Such measures could include creating a procedure at BRM for collecting information immediately after the disaster and feeding it into a standardized template for approval.

112. The Project had included a large number of contract packages that were found to be difficult to procure as well as implement. This led to contract award delays that were compounded by some of the EAs following different procurement practices. Future emergency assistance projects should limit the number of contract packages by awarding larger contracts. The OEM has been given to understand that the ADB emergency assistance project in 2004 is in line with this principle of reducing the number of contract packages.

113. On average, construction work started at the earliest 12 months after the floods had receded, and the restored infrastructure's benefits could not be made available before 18 months.

⁴⁶ The World Bank's review of its disaster recovery projects in Bangladesh found that there was no information on the construction and industrial projects amounting to 56% of the credit funded by the World Bank (Beck, Tony. 2005. *Learning Lessons from Disaster Recovery: The Case of Bangladesh*. Disaster Risk Management Working Paper Series 11. Washington, DC).

The next rainy season interrupted the work and delayed implementation further. Planners of emergency assistance projects should be aware of these factors to ensure more realistic implementation schedules.

114. The early appointment of BRM to administer the Project proved effective. BRM's role in hosting quarterly PSC meetings, as well as frequent meetings with each EA, contributed greatly to project success. This implies that emergency assistance projects could be better implemented when administered from the resident missions.

115. Loan covenants requiring borrowers to insure project facilities are not practical for projects of this magnitude involving multiple subprojects. Such covenants can be complied with only when a project has fewer subprojects. This should be discussed during loan negotiations.

116. Emergency assistance projects have consistently rehabilitated infrastructure to preflood levels to restore normal economic activity quickly. However, the restored facilities remain prone to, and are generally damaged by, subsequent floods. A consensus is emerging that rehabilitation after an emergency such as a flood should consider upgrading the infrastructure rather than merely restoring it to preflood levels. Current ADB policy for emergency assistance loans requires that the immediate short-term recovery phase be followed by long-term rehabilitation and reconstruction programs. These programs should consider upgrading infrastructure facilities. In effect, a specific link needs to be provided between the recovery and reconstruction phases. Such a link could be by way of including project preparatory TA in the recovery phase or expanding the role of consultants in the recovery phase to plan the upgrading. Future emergency assistance loans could incorporate specific packages to

- (i) provide emergency assistance in restoration of works,
- (ii) provide TA to review cases for upgrading,
- (iii) provide TA to study and design the upgrading works, and
- (iv) firm up arrangements for funding the upgrading works.

117. During the 1998 emergency assistance, ADB's loan had been used for a number of small repair projects in education, leading to difficulties in coordinating them and delaying implementation. Such repairs could typically form part of relief activities immediately after the floods, when other public buildings are being restored. The larger projects in transport and water supply and sanitation are more capital intensive, and the Government could use ADB funding more effectively by channeling it into these sectors. This does not in any way imply that ADB should reduce its involvement in education but merely urges ADB and the Government to give closer attention to prioritizing the sectors that will receive emergency assistance and capital.

118. Emergency assistance projects are typically spread all over the country. The disparate nature of the EAs and the resulting record-keeping activities make it difficult to locate the subprojects funded by ADB. This issue is further aggravated when the project performance evaluation report is conducted 4–5 years after project completion. Besides the difficulty of locating records, most EA officials have been transferred or are unavailable for various reasons. OED's project performance evaluation report could, therefore, be conducted within 2 years of project completion to ensure precise assessment.

C. Follow-Up Actions

119. Based on the evaluation findings, several follow-up actions are proposed for Government and ADB consideration.

Table 3: Recommendations

Item	Units Responsible For		
	Action	Monitoring	Timing
1. The OEM observed serious lapses in the maintenance of tracks in Sirajganj area (para. 31). Bangladesh Railway needs to address this issue soon to avoid accidents.	Bangladesh Railways	Bangladesh Railways	Immediately
2. Owing to the low-lying land in Bangladesh, floods are periodic and inevitable. ADB thus needs to develop a flood rehabilitation work plan specific to Bangladesh to provide emergency assistance to the Government quickly and effectively. This could enable trimming the loan-processing time.	ADB-SARD	ADB-SARD	Within 12 months
3. The Government is considering the establishment of a road fund dedicated to routine and periodic maintenance. ADB should work closely with the Government in setting it up and financing it.	Government and ADB	ADB	Immediately upon approval by Bangladesh's Parliament

ADB = Asian Development Bank, BRM = Bangladesh Resident Mission, EA = executing agency, EAL = emergency assistance loan, OED = Operations Evaluation Department, OEM = operations evaluation mission, PPER = project performance evaluation report, PPTA = project preparatory technical assistance, SARD = South Asia Department.

^a World Bank. 2005. *Project Performance Assessment Report on Bangladesh Coastal Embankment Rehabilitation Project*. Credit 2783-BD. Washington, DC.

Source: Operations Evaluation Mission.

APPRAISAL AND ACTUAL PROJECT COSTS
(\$ million)

Item	Appraisal			Actual		
	Foreign	Local	Total	Foreign	Local	Total
A. Civil Works						
1. Roads and Bridges	26.92	18.32	45.24			40.78
2. Rural Infrastructure	7.20	18.20	25.40			26.72
3. Railways	11.00	6.50	17.50			7.26
4. Water Resources	3.17	12.88	16.05			15.35
5. Education	2.01	6.54	8.55			6.58
6. Urban Development	2.78	5.64	8.42			7.88
Subtotal (A)	53.08	68.08	121.16			104.27
B. Equipment and Materials						
1. Railways	1.20	0.50	1.70			6.40
Subtotal (B)	1.20	0.50	1.70			6.40
C. Consulting Services						
1. Roads and Bridges	1.78	2.59	4.37			4.60
2. Railways	0.40	0.30	0.70			0.89
3. Education	0.00	0.20	0.20			0.17
4. Urban Development	0.02	0.40	0.42			0.00
Subtotal (C)	2.20	3.49	5.69			5.66
D. Land Acquisition and Resettlement	0.00	0.20	0.20			0.94
Subtotal (A+B+C+D)	56.48	72.27	128.75			117.27
E. Service Charge	1.00	0.00	1.00			0.94
Total	57.48	72.27	129.75	54.56	63.65	118.21

Source: Operations Evaluation Mission based on the report and recommendation of the President and project completion report.

ENGINEERING SURVEY REPORT

A. Survey Methodology

1. The Operations Evaluation Mission started working on 8 November 2005, taking the Dhaka Roads and Highways Department (RHD) zone as a sample area. Twelve districts of Dhaka zone were selected for engineering survey and inspection: Dhaka, Gazipur, Jamalpur, Kishoreganj, Manikganj, Munshiganj, Mymensingh, Narayanganj, Narsingdi, Netrokona, Sherpur, and Tangail. These were divided into three groups, each surveyed by an engineer. The groups conducted technical inspection of (i) roads, (ii) drainage structures and facilities, (iii) flood/irrigation facilities, (iv) growth centers and educational facilities, and (v) railways.

B. Rating Criteria

2. Technical inspection of roads and drainage structures rated them good, fair, poor, or damaged. Technical inspection of railways, flood protection works, irrigation facilities, growth centers, and educational facilities rated them good, fair, or poor.

3. **Roads.** For technical inspection of roads, the ratings were (i) good—roads with no potholes and pavement with minor undulation; (ii) fair—at most one pothole every 200 m and more undulation; (iii) poor—one to five potholes every 200 m and significant undulation, causing uneasiness for traffic movement; and (iv) damaged—more than five potholes every 200 m and traffic virtually moving on subbase or base course. This rating was correlated with the assessment of the shoulders, which were rated (i) good where more than 90% width was available without any type of undulation and erosion, (ii) fair where undulation and one erosion beyond 90% width was observed every 200 m, (iii) poor where width was less than 90% and more than one erosion was observed every 200 m, and (iv) damaged when more than 40% width was damaged with significant drop-off at pavement edge.

4. **Railways.** The Operations Evaluation Mission used operating speed to rate railway tracks: (i) good—trains operated at 90% or more of the optimum speed based on the track design, (ii) fair—60–80% owing to factors associated with safety and passenger comfort, and (iii) poor—less than 60%. The rail engineers confirmed that the operating speed varied at different sections because maintenance of the tracks varied.

C. Other Facilities

5. Drainage structures were rated (i) good when complete structural integrity was observed, (ii) fair when 10% integrity had been lost, (iii) poor where more than 10% integrity was lost, and (iv) damaged where total integrity was lost.

6. Flood and irrigation facilities were rated (i) good when no erosion was observed; (ii) fair when erosion outside was about 5%, but the top and inside was uneroded and structural integrity did not compromise functioning; and (iii) poor when the structure could not function.

7. Growth centers and educational facilities were rated (i) good when no structural or functional deficiency was observed and furniture was in good condition and clean; (ii) fair when no functional deficiency was observed, but required works such as painting and cleaning; and (iii) poor when major repairs to the structure and furniture were needed and it was not safe for habitation.

D. Summary of Findings

8. **Part A: Roads and Bridges.** A total of 299 kilometers (km) of district and regional roads and national highways were inspected. Only 49% of the roads inspected were good or fair, 28% poor, and 23% damaged. A regional summary of road inspection under RHD is in Table A2.1, and traffic survey results are in Table A2.2.

9. **Part B: Flood Control and Irrigation.** Two subprojects were inspected. The findings are summarized in Table A2.3. The flood protection embankment at both locations was found to be fair.

10. **Part C: Rural Infrastructure.** Rural infrastructure inspected consisted of 105 km of *upazilla* (subdistrict), rural, and union roads. They were generally good or fair. The findings are summarized in Table A2.4, and traffic survey results are in Table A2.5. One protection work at Simulkandi Bazaar in Kishoreganj was inspected. About 30 m of the high protective wall had collapsed because of erosion at the base. Growth centers were in good condition and clean.

11. **Part D: Railways.** Two subprojects were inspected. The Project reconstructed the tracks in Narayanganj and embankment protection works using geotextile technology in Razshahi. Under the 1998 Flood Damage Rehabilitation Project,¹ the track in one section was repaired and raised about 20 cm to keep it above severe-flood level. During the 2004 flood, however, it was again inundated so the track was raised another 20 cm in 2005 with funding from another aid agency. A large number of elastic rail clips, which secure the track to the sleepers, were missing, because local officials said, Government funding was lacking. Although official inspections reported this discrepancy, the Government has yet to take any action to rectify it. It presents a major safety hazard and the Government should solve this problem soon.

12. Under the 1998 Flood Damage Rehabilitation Project, flood protection works used geotextile technology. The section inspected has performed well, and all sections under the project reportedly performed just as well. Bangladesh Railway has thus adopted this technology for slope protection. However, concrete blocks were beginning to work loose in isolated areas. Repairs or replacements did not form part of the work plan of local officials, who thought that the Government depended on aid agency funding to repair or replace these sections. The findings are summarized in Table A2.6.

13. **Part E: Urban Development.** The OEM inspected 26 km of urban roads. The findings are summarized in Table A2.7 and traffic conditions on those roads are shown in Table A2.8.

14. **Part F: Education.** Seven educational facilities were inspected. The results are summarized in Table A2.9.

¹ ADB. 1998. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the People's Republic of Bangladesh for the Flood Damage Rehabilitation Project and on a Proposal to Use Loan Savings*. Manila (Loan 1666-BAN[SF], for \$104 million, approved on 18 December).

Table A2.1: Condition of Roads and Highways Department Road

Name of Road	Type of Road	Approx. Length (km)	Type of Pavement	Condition of Pavement	Type of Shoulder	Condition of Shoulder
Hasara-Shibrampur-Kharsur Road	District	20	Asphaltic	Poor	Earthen	Poor
Syedpur-Hasara-Shingpara Road	District	25	Asphaltic	Poor	Earthen	Poor
Bulta-Araihazar-Gopaldi Bazaar Road	District	25	Asphaltic	Good	Earthen	Fair
Shipbur-Lakpur Road	Regional	30	Asphaltic	15 km Fair 15 km Poor	Earthen	Fair
Bhaluka-Malikbari-Shakpur Road	District	30	Asphaltic	Destroyed	Earthen	Destroyed
Madhupur-Jamalpur Road	National	35	Asphaltic	Fair	Earthen	Fair
Sherpur-Nalitabari Road	District	20	Asphaltic	12 km Good 8 km Fair	Earthen	Fair
Tongi-Kaligonj-Ghorasal Road	Regional	30	Asphaltic	6 km Good 12 km Fair 12 km Destroyed	Earthen	Fair
Kishoreganj-Pakundia Road	District	20	Asphaltic	Good	Earthen	Good
Netrokona-Kalmakanda Road	District	18	Asphaltic	Destroyed	Earthen	Poor
Banai-Tongi Road	National	12	Asphaltic	Fair	Earthen	Good
Hemayetpur-Singair-Manikganj Road	Regional	34	Asphaltic	24 km Poor 10 km Destroyed	Earthen	Destroyed
Total Length		299		Good 63 km – 21% Fair 82 km – 27% Poor 84 km – 28% Destroyed 70 km – 23%		Good 32 km – 11% Fair 140 km – 47% Poor 63 km – 21% Destroyed 64 km – 21%

km = kilometer.

Source: Operations Evaluation Mission.

Table A2.2: Average Daily Traffic on RHD Roads

Name of Road	Trucks		Buses		Automobiles		Rickshaws		Bicycle, Motorcycle	
	No.	%	No.	%	No.	%	No.	%	No.	%
Hasara-Shibrampur-Kharsur Road	11	14	11	15	9	12	37	42	9	12
Syedpur-Hasara-Shingpara Road	12	13	16	21	6	7	42	47	8	10
Bulta-Araihazar-Gopaldi Bazaar Road	6	7	15	17	31	37	26	31	6	2
Shipbur-Lakpur Road	30	21	1	1	50	35	45	32	15	11
Bhaluka-Malikbari-Shakpur Road	6	35	3	18	2	12	0		6	35
Madhupur-Jamalpur Road	5	22	13	60	0		4	19	0	
Sherpur-Nalitabari Road	2	6.	5	16	2	6	3	10	19	61
Tongi-Kaligonj-Ghorasal Road	30	12	30	12	90	36	90	36	10	4
Kishoregonj-Pakundia Road	2	9	9	41	4	17	4	17	3	13
Netrokona-Kalmakanda Road	2	7	10	35	4	14	10	36	2	7
Banai-Tongi Road	23	11	109	32	28	13	37	18	10	5
Hemayetpur-Singair-Manikgonj Road	4	5	17	20	23	33	21	24	11	13
Total	133	13	239	23	249	24	319	31	99	10

No. = number, RHD = Roads and Highways Department.
Source: Operations Evaluation Mission.

Table A2.3: Bangladesh Water Development Board Projects

Name of the Project	District	Type of Structure	Condition
Balali Padmasree	Kishoreganj	Embankment	Fair
Hanjda Embankment	Netrokona	Embankment	Fair

Source: Operations Evaluation Mission.

Table A2.4: Condition of Local Government Engineering Department Road

Name of Road	Type of Road	Approx. Length (km)	Type of Pavement	Condition of Pavement	Type of Shoulder	Condition of Shoulder
Sahebprotap-Mulpara Road	Rural	12	Asphaltic	4 km Poor 8 km Destroyed	Earthen	5 km Poor 7 km Destroyed
Taligati-Sonazur Road	Upazilla	15	Asphaltic	Fair	Earthen	Good
Ulthura Bazaar-Morandi Road	Union	10	Asphaltic	Good	Earthen	Good
Madrasha Gala Road	Upazilla	8	Asphaltic	Good	Earthen	Good
Bhengula-Pigna Road	Union	6	Asphaltic	Poor	Earthen	Poor
Kendua-Kalibari-Sonatia Road	Union	7	Asphaltic	Fair	Earthen	Fair
Melandah-Madargonj Road	Upazilla	10	Asphaltic	Good	Earthen	Good
Nalitabari-Barnijuri Road	Rural	15	Asphaltic	Fair	Earthen	Good
Bhairab-Mendipur Road	Upazilla	8	Asphaltic	Good	Earthen	Good
Ulka Cinema Hall-Burobaika Road	Rural	6	Asphaltic	2 km Good 2 km Poor 2 km Destroyed	Earthen	Poor
Munshirhat-Chitulia Road	Upazilla	8	Asphaltic	Fair	Earthen	Good
Total Length		105		Good 38 km – 36% Fair 45 km – 43% Poor 12 km – 11% Destroyed 10 km – 10%		Good 74 km – 70% Fair 7 km – 7% Poor 17 km – 16% Destroyed 7 km – 7%

km = kilometer.

Source: Operations Evaluation Mission.

Table A2.5: Average Daily Traffic on LGED Roads

Name of Road	Trucks		Buses		Automobiles		Rickshaws		Bicycle, Motorcycle	
	No.	%	No.	%	No.	%	No.	%	No.	%
Sahebprotap-Mulpara Road	2	3.5	0	0.0	5	8.8	30	52.6	20	35.1
Taligati-Sonazur Road	0	0.0	0	0.0	4	21.1	10	52.6	5	26.3
Ulthura Bazaar–MorandiRoad	0	0.0	0	0.0	0	0.0	2	50.0	2	50.0
Madrasha Gala Road	2	16.7	0	0.0	8	66.7	2	16.7	0	0.0
Bhengula-Pigna Road	0	0.0	0	0.0	2	33.3	2	33.3	2	33.3
Kendua-Kalibari-Sonatia Road	3	30.0	0	0.0	0	0.0	3	30.0	4	40.0
Melandah-Madargonj Road	0	0.0	0	0.0	6	46.2	5	38.5	2	15.4
Nalitabari-Barnijuri Road	2	13.3	0	0.0	5	33.3	4	26.7	4	26.7
Bhairab-Mendipur Road	7	4.8	1	0.7	1	0.7	100	68.0	38	25.9
Ulka Cinema Hall-Burobaika Road	2	2.4	0	0.0	2	2.4	60	71.4	20	23.8
Munshigonj-Chituhia Road	10	7.7	6	4.6	51	39.2	51	39.2	12	9.2
Total	28	5.6	7	1.4	84	16.9	269	54.1	109	21.9

No. = number, LGED = Local Government Engineering Department.
Source: Operations Evaluation Mission.

Table A2.6: Summary of Technical Inspection of Railway

Zone	District	Type of Work Performed	Condition
Rajshahi	Sirajganj	Flood protection work	Fair
Dhaka	Narayanganj	Track rehabilitation and raising of embankment	Fair

Source: Operations Evaluation Mission.

Table A2.7: Condition of Urban Road

Name of Road	Type of Road	Approx. Length, km	Type of Pavement	Condition of Pavement	Type of Shoulder	Condition of Shoulder
Bangabandhu Road-Rail Crossing	Urban	3	Asphaltic	Fair	Earthen	Poor
Nawab Salimullah Road-Manpura Hospital Road	Urban	4	Asphaltic	Poor	Earthen	Poor
District Court Road	Urban	4	Asphaltic	Poor	Earthen	Poor
Thana-BIDC Road	Urban	3	Asphaltic	Destroyed	Earthen	Destroyed
UNO Office Road	Urban	4	Asphaltic	Poor	Earthen	Good
District Court-Beltura Bazaar Road	Urban	4	Asphaltic	Fair	Earthen	Fair
Munshiganj Bus Stand-Judge Court Road	Urban	4	Asphaltic	Fair	Earthen	Good
Total Length		26		Good 0–0% Fair 11–42% Poor 12–46% Destroyed 3–12%		Good 8–31% Fair 4–15% Poor 11–42% Destroyed 3–12%

Source: Operations Evaluation Mission.

Table A2.8: Average Daily Traffic on Urban Roads

Name of Road	Trucks		Buses		Automobiles		Rickshaws		Bicycle, Motorcycle	
	No.	%	No.	%	No.	%	No.	%	No.	%
Bangabandhu Road-Rail Crossing	36	16.7	12	5.6	43	19.9	119	55.1	6	2.8
Nawab Salimullah Road-Manpura Hospital Road	10	7.9	22	17.5	14	11.1	76	60.3	4	3.2
District Court Road	5	5.9	5	5.9	0	0.0	60	70.6	15	17.6
Thana-BIDC Road	0	0.0	0	0.0	3	9.1	15	45.5	15	45.5
UNO Office Road	4	18.2	6	27.3	4	18.2	5	22.7	3	13.6
District Court-Beltura Bazaar Road	6	6.1	0	0.0	5	5.1	58	58.6	30	30.3
Munshiganj Bus Stand-Judge Court Road	12	7.0	17	9.9	31	18.1	99	57.9	12	7.0
Total	73	9.7	62	8.2	100	13.3	432	57.4	85	11.3

No. = number.

Source: Operations Evaluation Mission.

Table A2.9: Summary of Finding of Educational Institution Inspection

Name of Institution	Location	Type of Structure	Condition
Bhaluka Dakhil Madrasha	Mymensingh	R.C Building	Fair
Araihazar Emdadul Umul Dakhil Madrasha	Narayanganj	R.C Building	Poor
Kararchar Mour T. Hossain High School	Narshingdi	R.C Building	Fair
Moltkhola High School	Keshoreganj	Tinshade Building	Fair
Charigram Sahadat Ali Khan High School	Manikganj	R.C Building	Fair
Kurmitola High School	Dhaka	R.C Building	Good
Madhupur Pilot Girls High School	Tangail	Tinshade Building	Poor

Source: Operations Evaluation Mission.

CONSULTANTS PERFORMANCE

1. The performance of the consultants for each component is summarized below:
2. **Part A: Roads and Bridges.** At appraisal, 92 person-months of international and 696 person-months of domestic consultants were estimated to be required, and services to cost \$4.4 million. Actual input was 95 person-months of international and 799 person-months of domestic consultants. The project completion report (PCR) reported that more than 300 contracts were awarded in this component, and that its consulting services were satisfactory, although it referred to the possibility of poor construction supervision because of the large number and geographical diversity of contracts to be supervised by few consultant personnel.
3. **Part B: Flood Control and Irrigation.** At appraisal, 16 person-months of international and 19 person-months of domestic consultants were estimated to be required. The cost of consulting services would be financed under an ongoing technical assistance (TA). Actual input was 10 person-months of international and 12 person-months of domestic consultants. Designs were prepared by the Bangladesh Water Development Board. Although a total of 243 small contract packages were awarded, they were concentrated in seven subproject areas, enabling better supervision by the consultants.
4. **Part C: Rural Infrastructure.** Consulting services under this component were financed through existing loans and TA contracts. Appraisal estimates were realized. Designs were prepared by the Local Government Engineering Department with assistance from the consultants. Civil works packages were somewhat larger than those of the Roads and Highways Department, but remained below the \$200,000 threshold.
5. **Part D: Railways.** At appraisal, 20 person-months of international and 40 person-months of domestic consultants were estimated to be required. Actual input was 22.8 person-months of international and 37.0 person-months of domestic consultants. Designs were prepared by the Bangladesh Railway with the consultants' assistance.
6. **Part E: Urban Infrastructure.** Consulting services were partly financed through loan savings.¹ At appraisal, it was estimated that 3 person-months of international and 208 person-months of domestic consultants distributed among four executing agencies would be required. Actual input was 2.6 person-months of international and 206.0 person-months of domestic consultants. This was on the higher side because a large number of civil works were packages awarded. Designs were prepared by the consultants.
7. **Part F: Education.** At appraisal, 70 person-months of domestic consultants were estimated to be required. Actual input was 67.5 person-months of domestic consultants. Works consisted primarily of repair of schools damaged by floods and procurement of furniture to replace items damaged in the flood. Review missions noted (i) schools that had not suffered flood damage were included in the projects proposed for tender; (ii) the design of some

¹ ADB. 1995. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the People's Republic of Bangladesh for the Secondary Towns Infrastructure Development Project II*. Manila (Loan 1376-BAN[SF], for \$65 million, approved on 19 September); ADB. 1991. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grant to the People's Republic of Bangladesh for the Dhaka Integrated Flood Protection Project*. Manila (Loan 1124-BAN[SF], for \$91.5 million, approved on 21 November); ADB. 1992. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the People's Republic of Bangladesh for the Secondary Towns Integrated Flood Protection Project*. Manila (Loan 1202-BAN[SF], for \$55 million, approved on 3 December); and ADB. 1993. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grants to the People's Republic of Bangladesh for the Second Water Supply and Sanitation Project*. Manila (Loan 1264-BAN[SF], for \$31 million, approved on 16 November).

rehabilitation works was inappropriate; (iii) works proposed were not in line with the project scope; and (iv) in some cases, construction supervision was poor. The PCR reported that some of the problems encountered in part F were caused by inadequate consultant input.

RATING MATRIX FOR CORE EVALUATION CRITERIA

1. To establish a rating matrix for the Project, the following steps were taken:
 - (i) Project cost was distributed among the six parts, and the percentage of overall project cost attributed to each.
 - (ii) A rating was allocated to each project part by applying the following criteria:
 - (a) 3 = highly relevant, 2 = relevant, 1 = partly relevant, or 0 = irrelevant;
 - (b) 3 = highly effective, 2 = effective, 1 = less effective, or 0 = ineffective;
 - (c) 3 = highly efficient, 2 = efficient, 1 = less efficient, or 0 = inefficient; and
 - (d) 3 = most likely to be sustainable, 2 = likely to be sustainable, 1 = less likely to be sustainable, 0 = unlikely to be sustainable.
 - (iii) The rating for each part was weighted based on the cost of that part to arrive at a weighted rating for each criterion.
 - (iv) To arrive at the overall assessment, a weighted average was applied as follows:
 - (a) relevance = 20%,
 - (b) effectiveness = 30%,
 - (c) efficiency = 30%, and
 - (d) sustainability = 20%.

2. The tables below correspond to each of the steps described above.

Table A4.1: Project Cost
(\$ million)

Project Part	Civil Works	Equipment and Materials	Consultant Services	Other Loans	Total	Project Cost ^a (%)
Part A: Roads and Bridges	40.78		4.60	6.32	51.70	34
Part B: Flood Control and Irrigation	15.35			8.59	23.94	16
Part C: Rural Infrastructure	26.42			2.98	29.40	19
Part D: Railway	7.26	6.40	0.89	3.29	17.84	12
Part E: Urban Development	7.88			14.95	36.13	15
Part F: Education	6.58		0.17		6.75	4

a Weight allocation in overall performance assessment is based on the percentage of the individual project part of the total project cost.

Source: Asian Development Bank. 2003. *Project Completion Report on the Flood Damage Rehabilitation Project in Bangladesh*. Manila.

Table A4.2: Matrix for Allocation of Weighted Rating Based on Cost of Each Part

Criterion	Part A	Part B	Part C	Part D	Part E	Part F	Weighted Rating
	34%	16%	19%	12%	15%	4%	
Relevance	3 1.02	3 0.48	3 0.58	3 0.35	3 0.45	2 0.09	2.96
Effectiveness	3 1.02	2 0.31	3 0.58	2 0.23	3 0.45	3 0.13	2.73
Efficiency	2 0.68	2 0.31	2 0.39	2 0.23	2 0.30	1 0.04	1.96
Sustainability	0.7 0.24	1 0.16	1 0.19	0.7 0.08	1 0.15	0.7 0.03	0.85

Source: Operations Evaluation Mission.

Table A4.3: Matrix for Overall Assessment

Criterion	Weight (%)	Part A	Part B	Part C	Part D	Part E	Part F	Weighted Rating	Performance Assessment
Relevance	20	3	3	3	3	3	2	2.96	0.59
Effectiveness	30	3	2	3	2	3	2	2.73	0.82
Efficiency	30	2	2	2	2	2	1	1.96	0.59
Sustainability	20	0.7	1	1	0.7	1	0.7	0.85	0.17
Total	100	2.2	2.0	2.3	1.9	2.3	1.7		2.17

Source: Operations Evaluation Mission.

SOCIOECONOMIC SURVEY REPORT

A. Objective and Scope of the Study

1. The objective of the socioeconomic study was to evaluate the impact of the subprojects on the social and economic life of the people in the project area, especially in terms of enabling them to restore normal levels of economic and social activity. The study intended to obtain the views of project-affected people using various parameters intended to provide feedback on the subprojects.

B. Methodology

2. Survey techniques included (i) field observation, (ii) formal and informal interviews with project-affected people using a questionnaire, (iii) focus group discussions, and (iv) case studies. The sample area comprised the Roads and Highways Department's (RHD) in Dhaka zone.¹ A stratified random sampling method was followed to select the sample area as well as sample population to cover the different sectors as well as various groups (government and nongovernment).

3. Table A5.1 illustrates the sample distribution by location and organization. In total, 372 persons were interviewed. Focus group discussions were also held in the study area.

Table A5.1: Sample Size by Category for Socioeconomic Survey
(number of respondents)

Agency/ District	Roads RHD	Roads/ Markets LGED	Urban Project LGED	Flood Control and Irrigation BWDB	School Colleges DSHE	Resettlement	Total
Netrokona	8	8	8	8			32
Sherpur	9	9	8				27
Jamalpur	8	9	9				27
Kishorganj	8	8	8	8	8		40
Mymensingh	9	8	8		8		33
Tangail	8	8	8		9		33
Dhaka	8						8
Gazipur	8	8	8				24
Manikgonj	8	8	8		8		32
Munshigonj	8		16				24
Narshingdi	10	8	12		10		40
Narayanganj	8	8	8		8		32
Rangpur (Teesta)						16	16
Total	100	82	101	16	51	16	368

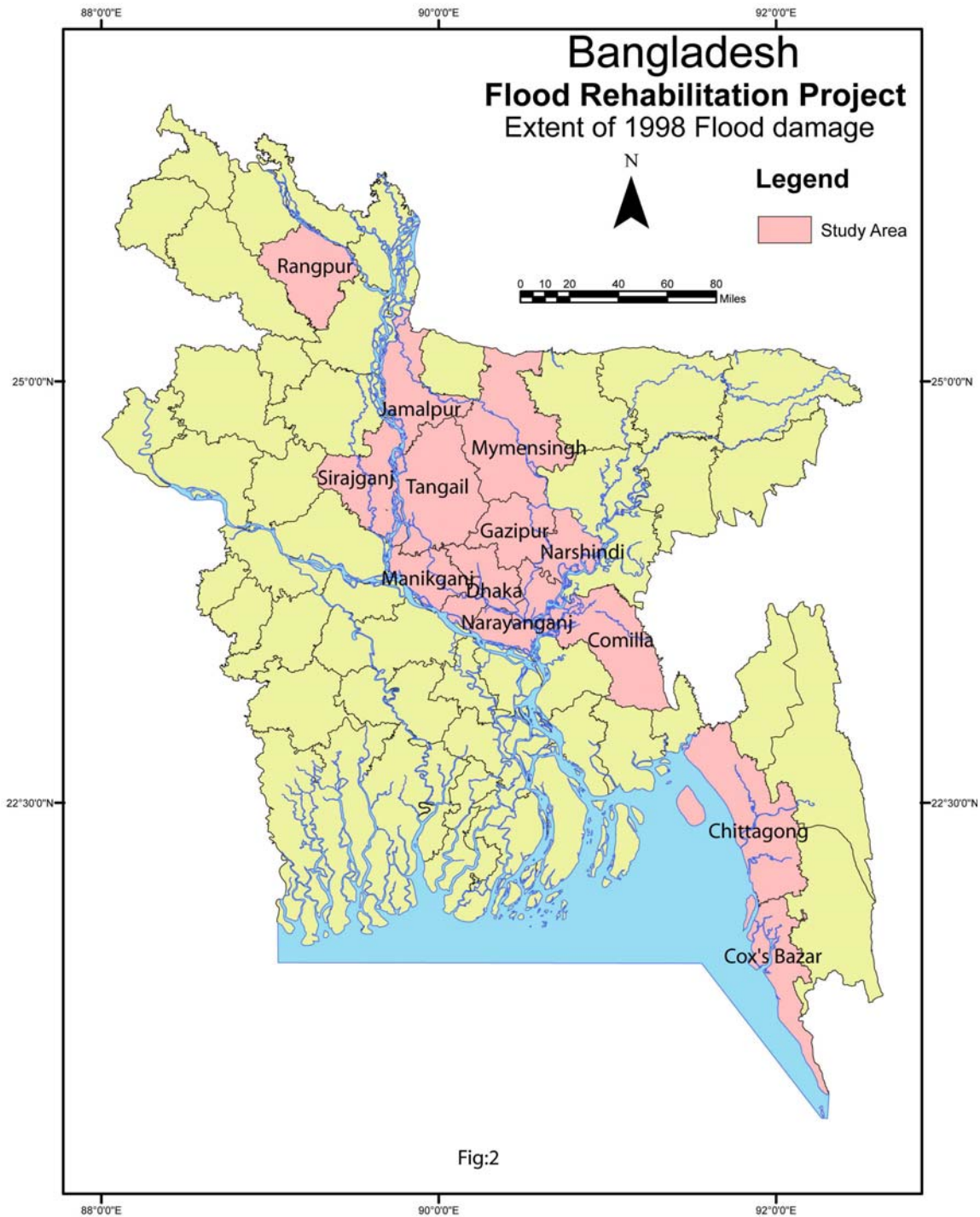
BWDB = Bangladesh Water Development Board, DSHE = Department of Secondary and Higher Education, LGED = Local Government Engineering Department, RHD = Roads and Highways Department.

Source: Operations Evaluation Mission.

4. Figure A5 illustrates the location of the study area.

¹ Dhaka zone comprised the districts of Dhaka, Gazipur, Jamalpur, Kishoreganj, Manikganj, Munshiganj, Mymensingh, Narayanganj, Narsingdi, Netrakona, Sherpur, and Tangal.

Figure A5: Area of Study of the Socioeconomic Survey



5. Of the respondents, 80% were male and 20% female, randomly selected in the selected subproject area and from various occupational groups. The largest group consisted of owners or employees of business enterprises, followed by farmers; transport operators; professionals, including teachers; doctors; and housewives.

6. Three garment industries damaged by the 1998 flood were used as case studies. They were based in Gazipur and Dhaka. Effectiveness of resettlement activities was evaluated through interviews of resettled people and stakeholders on the Teesta right embankment rehabilitation subproject in Rangpur district.

C. Analysis of the Results

7. Severity of impact can be broadly categorized based on the physiographic condition or elevation of the locations within the sample area (Dhaka). Severity of floods is measured by how much flood waters rise and for how long they stay. In 1998, the flood waters rose fairly quickly and stayed high for 11 weeks over 100,000 square kilometers or 68% of the country. The northern districts of Jamalpur, Netrokona, Sherpur, and parts of Kishoreganj and Mymensingh are low-lying areas and face flash floods almost every year. The mid-zone districts include Tangail, Gazipur, parts of Dhaka, and Narsingdi, located on a higher level and less prone to floods, although the 1998 floods badly affected them. The southern districts of Munshiganj, Narayanganj, and Manikganj are flooded every year but face much less risk, although the 1998 floods were severe. The perceptions of the people in these three categories differed owing to their diverse experiences.

D. Analysis of the Socioeconomic Situation during the Flood

8. Table A5.2 illustrates perceptions of the impact of the 1998 floods in the study area, on the basis of the three categories identified above. Most respondents mentioned that roads were unusable; the next-largest number of respondents mentioned damage to houses and public buildings and loss of trees and crops. Perception varies with the respondents' location.

Table A5.2: People's Response on Level of Severity of Damage due to Flood in 1998
(multiple responses, %)

Response	Northern Districts	Mid-Zone Districts	Southern Districts
Roads not usable	60	47	64
Damage to houses and public buildings	55	30	56
Damage to household goods	12	18	14
Loss of trees and/or crops	55	45	36
Wash out of fish ponds	15	12	23

Source: Operations Evaluation Mission.

9. During the floods, use of savings and borrowings were the most common means of managing livelihoods (Table A5.3). A number of project-affected people were heavily dependent on relief efforts of the Government and nongovernment organizations (NGOs), while some borrowed from others to weather the crisis. Loans were in the form of food grain as well as cash.

Table A5.3: Management of Livelihood during Floods
(multiple responses, %)

Livelihood Option	Northern Districts	Mid-Zone Districts	Southern Districts
Savings	29	21	31
Selling of livestock	6	5	13
Labor services	2	6	7
Rickshaw pulling	6	2	4
Plying boat	3	1	4
Provision of services in other locations	7	12	9
Borrowings	24	25	28
Small-scale business	23	9	28
Relief	28	26	13

Source: Operations Evaluation Mission.

10. From the survey, it was apparent that NGOs and people from the community were more active and effective in distributing relief than government organizations. In several urban areas, relief centers were organized by the local public representative and the local government office. These centers provided cooked food to the affected people. Most of this food was distributed by boat. Many people earned their livelihood by plying boats in about 3 feet water on the road, including some rickshaw pullers.

11. Most rickshaw pullers had migrated from rural areas before the floods. During the floods, many left for their villages to attend to their families. Some people came from other flooded areas to earn their livelihood in flooded urban areas. People moved in both directions although not for the same reasons.

12. Most of the farmers expressed a desire to have a supply of good seeds and seedlings after the floods to resume their livelihood as quickly as possible. During the field study, it was observed that many NGOs could provide this, enabling the farmers to benefit from the fertile soil left by the floods. The Ministry of Agriculture supplied seedlings of a man crop² for late sowing and for vegetables. Farmers gave more priority to farm-based support rather than improvement of transport. They perceived that quick and cheap supply of seeds was beneficial for sustaining their livelihoods. Apparently, local businessmen and traders take advantage of the post-flood situation by charging higher prices for these seeds.

13. Respondents said that in most flood-affected areas, food storage facilities were adequate (Table A5.4). Less than 25% of respondents mentioned that food was lacking during the flood, and they had generally stayed in flood shelters. However, a significant number of respondents perceived that food grain were available but at a higher price. They could not recall any deaths by starvation, so food scarcity might not have been widespread. In most places, boats were used to carry food grain for short and long distances. Damaged roads hindered transport in most places.

² Crop activities (especially those of rice) are distinguished by seasons—aus (July–August), oman (December–January), and boro (March–May).

Table A5.4: Food Availability and Storage during the Flood
(multiple responses, %)

Response	Northern Districts	Mid-Zone Districts	Southern Districts
Not available	28	17	26
Available but costly	62	76	65
Stored on high place but accessible	29	33	8
No food crisis	6	0	17

Source: Operations Evaluation Mission.

E. Analysis of Socioeconomic Situation during the Recovery Period

14. Construction on the subprojects started about 12 months after the floods receded. Work was delayed most often because of the Government's ignorance or lack of responsibility in rehabilitating these services (Table A5.5). The respondents said that local government officials were slow to meet infrastructure needs. Another reason was that the local government had to wait for the waters to recede before assessing the damage and needs. The respondents also mentioned that local business influenced the local government officials to delay the construction work to let the businessmen continue selling goods at higher prices. People said that corruption marred the award of contracts, delaying the start of construction.

Table A5.5: Reasons for Delayed Starting of Work
(multiple responses, %)

Response/Zone	Northern Districts	Mid-Zone Districts	Southern Districts
Irresponsibility of the Government	34	40	39
Noncooperation from local people	18	11	4
Waiting for water to recede	19	19	3
Corruption	19	19	5
Influence of local businessmen to make business	5	3	9
Others	6	7	12

Source: Operations Evaluation Mission.

15. Although people appreciated the benefits from the subprojects, all confirmed that they were consulted neither on subproject selection nor design. The general perception was that project decisions are made at the top. Local politicians only occasionally influence such decisions.

16. Local people appreciated the appropriateness of the Project for rehabilitation of the area, but often questioned the project designs such as road elevation in relation to flood levels, design of bridges, and side slope maintenance.

17. Awareness of the environment and the need to preserve it was high among the people interviewed. They seemed to be aware of the need to grow tree plantations along the road to prevent it from washing away during floods. Many referred to the social forestry project where benefits from the plantation were distributed between the caretaker and the implementing agency. Such programs were perceived to be effective.

18. Bridge height was an important factor affecting access during the floods. In Munshiganj, people said that many boats could not ply under the bridges as these were low and the water levels high. As a result, some areas could not be accessed at all until the water levels went down.

19. Most people interviewed said subprojects had a positive impact (Table A5.6). It can be concluded that the Project had a high positive impact on the life and livelihood of the people.

Table A5.6: Contribution of the Subprojects
(multiple responses, %)

Outcome	Northern Districts	Mid-Zone Districts	Southern Districts
Improved and easy road transportation	73	63	62
Restoration of good business opportunities	82	76	89
Enhanced importance of the locality	92	86	91
Enhanced the socioeconomic status of the people in the project area	94	76	94
Restoration of educational services	56	63	51

Source: Operations Evaluation Mission.

A number of respondents lost their means of livelihood during the flood. Some could not recover their livelihoods at all, while others did recover over time. Table A5.7 broadly indicates the time taken by the affected people to recover their livelihoods. People in the mid-zone districts took less time than others to recover because, among various reasons, they were close to urban centers, their livelihood opportunities were more diversified, and infrastructure rehabilitation was quicker.

Table A5.7: Time Taken to Recover Livelihoods after the Floods
(%)

Response	Northern Districts	Mid-Zone Districts	Southern Districts
Less than 1 year	67	78	52
1–2 years	21	16	37
3–4 years	08	04	05
5 years and more	04	02	06

Source: Operations Evaluation Mission.

20. The respondents were asked to suggest ways for the Government to reduce the impacts of floods. One was a mix of flood control and flood-proofing measures to reduce problems during and after the floods (Table A5.8). While they considered dredging of rivers useful, they highlighted the importance of adequate supply of seeds, health awareness, electricity supply, among others to reduce the impact of floods. They did not give a flood-warning system high importance, perhaps because they are unaware of its benefits.

Table A5.8: Perception of the Government's Role in Reducing Adverse Impact of Floods
(multiple responses, %)

Response/Zone	Northern Districts	Mid-Zone Districts	Southern Districts
Improved flood-warning system	65	54	55
Construction of drains and enough drainage facilities along the road	43	85	76
Dredging of rivers	85	71	78
Arrangements for clean water supply	79	90	83
Construction of barrage and embankment	56	23	49
Construction of elevated school buildings and flood shelters	49	19	57
Increase people awareness about health and sanitation with support services	86	84	93
Electricity supply during floods	75	96	79
Supply seed and seedlings with support services after floods	80	46	88
Health service facilities during and after floods	76	76	83
Special arrangements for women in flood shelter	39	10	36
Provide loans after flood	76	43	81

Source: Operations Evaluation Mission.

F. Resettlement on Right Bank of Teesta River

21. To evaluate the status of the resettlement, members of 16 project-affected households were interviewed. Resettlement activities were found to be generally satisfactory. The resettlement plan was designed following the Asian Development Bank (ADB) guidelines. People were consulted during resettlement plan design, and 62 households on the right of way were identified for relocation based on the census survey of December 1998. The Bangladesh Water Development Board (BWDB) was the Executing Agency, and an NGO, Christian Commission for Development in Bangladesh, was appointed to implement the resettlement plan in 1999.

22. The resettlement was triggered by the realignment of the river course. During implementation, it was found that many more households than the original number affected by the realignment had resettled in areas adjacent to the right of way because (i) the existing embankment was on high ground and low-lying land had been washed away by the flood, (ii) the areas were close to their farms, and (iii) the people hoped that the planned resettlement would benefit them. Households outside the proposed retired alignment were called indirectly affected because of the apparent loss of value of agriculture land and the likely adverse impact owing to flooding of homesteads near the embankment. Upon completion of the resettlement, the total number of affected people (APs) was 213.

23. The amount of land proposed to be acquired for the Project was small, but the adverse impact was significant because of smaller farmholdings in the area. Some of the APs were landless and/or sharecroppers who earned their livelihood primarily from wages and limited cultivation. The resettlement changed their sources of income, requiring a compensation of some form.

24. The resettlement plan had a few inconsistencies in the entitlements relating to the compensation payable to non-titleholders and indirectly affected people. However, because of the specific nature of ADB's resettlement policy, these inconsistencies were ironed out.

25. Out of the 213 APs identified by BWDB, 79 were indirectly affected. Compensation to some APs was delayed. The local administration headed by the deputy commissioner attributed this delay to fulfilling requirements under the Cash Compensation Law. However, some people attributed this to corruption, mentioning that they had to bribe local officials to get their compensation sanctioned from the deputy commissioner's office. They said that although the NGO paid them through bank checks, local politicians sought money from them informally.

26. The deputy commissioner's office stated that the some of the APs could not be compensated since they failed to produce the documentation to support their claim to land ownership. Some, such as squatters, were given a grant to purchase house plots.

27. There was adequate community participation in implementing the resettlement plan. People expressed general satisfaction on the performance of the NGO.

28. Most of the people who received compensation are still living in the locality, within and outside the embankment. The socioeconomic condition of some has improved, but most still live in the same condition as before (Table A5.9).

Table A5.9: Change of Socioeconomic Condition of the Affected People after the Resettlement

Response	Number of Persons	%
Much better than before	2	12.50
Marginally better than before	12	75.00
Worse than before	2	12.50
Total	16	100.00

Source: Operations Evaluation Mission.