



1. Project Data :		Date Posted : 08/03/2000	
PROJ ID: P009877 OEDID: C2241		Appraisal	Actual
Project Name : Dam Safety	Project Costs (US\$M)	196.8	115.2
Country: India	Loan/Credit (US\$M)	153	87.5
Sector, Major Sect .: Natural Resources Management, Environment	Cofinancing (US\$M)		
L/C Number: C2241; L3325			
	Board Approval (FY)		91
Partners involved :	Closing Date	09/30/1997	09/30/1999
Prepared by :	Reviewed by :	Group Manager :	Group:
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2. Project Objectives and Components

a. Objectives

To improve the safety of selected dams within Project States through (a) remedial works, (b) installation of basic safety facilities, and (c) strengthening institutions of the central government and the project states responsible for assuring dam safety. The participating states were Madhya Pradesh, Orissa, Rajasthan, and Tamil Nadu.

b. Components

- (1) institutional strengthening of central and state water management institutions through assignment of staff, training, TA, provision of equipment and consultant support (\$3 million)
- (2) reviewing the existing flood forecasting facilities in one or more selected interstate river basins and exploring the possibility of improving such facilities (\$10.7 million)
- (4) TA to the state Dam Safety Committees to be established in each state; institutional strengthening of state Dam Safety Organizations, Departments of Irrigation and Departments of Water Resources (as applicable) through additional staff, TA, training, provision of equipment and consultants (\$9 million)
- (5) improvement of basic dam safety related facilities (telecommunications equipment, real time hydrologic data acquisition equipment, dam safety monitoring equipment, power backup systems, access roads and other means) at an unspecified number of dam sites selected by the project states (427 million)
- (6) remedial works at 33 named dams (or alternative/additional higher priority dams) selected in accordance with criteria established by the state's Dam Safety Committee (\$147 million)

c. Comments on Project Cost, Financing and Dates

\$69.6 million or 45% of the Loan/Credit was canceled despite a two year extension. \$23 million was canceled in June 1995. A further \$27.2 million was canceled July 1997, \$10.4 million September 1998 and \$9 million in February 2000. Significant depreciation of Indian Rupee over the life of the project (from Rs 18.6 to Rs 42.5 = \$1.00) accounted for much of the cancellation. Overall project cost was 56% of SAR estimates in terms of \$ and 93% in terms of Rs.

The project was restructured twice due to slower than planned progress. This was mainly through reduction in the scope of component (6) that accounted for 75% of project cost.

3. Achievement of Relevant Objectives :

The relevant objectives were partially achieved. Remedial works and installation of basic safety facilities appear to meet the poorly defined SAR targets (the doubt about targets is discussed in the ICR). Institutional development and strengthening was achieved in 75% of the target states.

4. Significant Outcomes /Impacts:

- This was the first World Bank project devoted entirely to dam safety and put the issue on India's development agenda. Globally, India has the third largest number of dams (3,600) after the USA and China. Thus the project was highly relevant.
- In three of the four states there was substantial institutional strengthening that set up dam safety organizations and the Center played an active role in this process.
- Probably the most significant impact was the final ICR workshop that aired many of the dam safety criteria and

implementation issues in a forum of 58 participants who represented center and state governments, NGOs, beneficiaries, consultants and contractors. The consensus developed at this workshop provides strong guidance to government of the scope and type of future support required to ensure long term dam safety in India - it emphasized development of a cost-benefit approach. It also raised the level of the debate about maintaining investment to maintain the integrity of dams as well as new investment to reduce environmental risks.

- Dam Safety Inspection and Evaluation Systems were introduced into the four participating states that had a total of 947 large dams. 128 large dams were subject to a hydrology review (compared with the SAR target of 170), and 49 to structural review (SAR target was 44).
- Over 1,500 large dams (compared with an SAR target of 947) were inspected for potential hazards and 81 (compared with the SAR target of 147) were subject to more detailed investigation and 55 were short-listed for remedial work (the same as the SAR target).
- 33 large dams in four states (60% of SAR targets) were fully rehabilitated to meet interim dam safety criteria and another 16 remain partially completed. Access roads were provided to 181 dams, hydrological instrumentation to 172, communication systems to 148, and standby generators to 103.

5. Significant Shortcomings (including non-compliance with safeguard policies):

1. There is a lack of distinction between investments for improved design to upgrade dam safety *per se* and investments induced by inadequate and deferred maintenance that threaten dam safety. It is impossible to tell from the ICR how much of the credit went into deferred maintenance.
2. Poor appraisal ignored or downplayed well known systemic institutional issues of the water sector in India that slowed implementation. These include: uneven coordination between center and states, overlapping and hence unclear lines of authority, lack of enabling regulatory framework for the new national /state safeguard policy, and establishment norms and processes that frustrated specialized staffing for the project.
3. Cost-benefit assessment of dam safety was only just developing as the project was implemented. Accordingly, there was no means to select the most efficient investment opportunities (although this is now being redressed). There are still fundamental differences among central and state agencies on criteria to judge dam safety: 63% of the ICR workshop participants thought that the current norms for deciding the design flood need to be changed, and 53% thought that the progress with flood forecasting was not satisfactory.
4. Environmental impact assessment absent (non-compliance with OP 4.01).
5. Only 28% of stakeholders at the ICR workshop thought the project had fully achieved its objectives while 60% thought achievements were partial.
6. Dam safety in states' planning/budgeting process is still beset with problems. 61% of the 58 participants at the ICR workshop stated that dam safety, though important, is not a first charge on budget. Similarly 79% of participants said that O&M funds for dam maintenance were not based on dam inspection /investigation reports but were either token provisions or based on *ad hoc* norms per ha (of irrigated area).
7. Institutional strengthening efforts are seriously undermined by frequent staff rotations. Only 18% of 58 participants at the ICR workshop thought that adequate training had been given to more than half of the staff responsible for dam safety. And 52% of responding participants thought that training given only marginally enhanced the quality of the execution of the work.
8. Only 20% of ICR workshop participants thought that the state Dam Safety Organizations would be maintained at full complement once the project was completed. Overall, slightly more than half of participants (52%) thought that states were not in a position to sustain the dam safety program.
9. Implementation was impeded by the center's delay in allocation of Bank funds, state's slow build up of essential staffing, inadequate prior design, and procurement /contract problems. As a result, project restructuring eliminated 15 dams from the remedial list and ejected Tamil Nadu state from the project because of inadequate progress on institutional development.
10. There was little progress towards improving flood forecasting on an interstate river basin.

6. Ratings:	ICR	OED Review	Reason for Disagreement /Comments
Outcome:	Satisfactory	Marginally Satisfactory	Physical objectives partly achieved. There are still an unanswered question about deferred maintenance and sustainable funding for dam safety efforts.
Institutional Dev.:	Substantial	Modest	One state (25% of the project) dropped out of the program due to poor institutional performance (even though it has received extensive Bank assistance for reform through the WRCP project). Still coordination issues; dam safety

			criteria not yet finalized; binding regulatory environment absent; dam safety subject to tunnel vision .
Sustainability :	Likely	Uncertain	Inadequate budgets and rotation of trained staff. There is still too much emphasis on further Bank support to ensure future of dam safety efforts .
Bank Performance :	Satisfactory	Satisfactory	Deficient appraisal was more than compensated by supervision that improved markedly in the last three years of the project.
Borrower Perf .:	Satisfactory	Satisfactory	This is on the generous side: OED believes, on balance, that the good performance in the Center and among Maharashtra, Orissa and Rajasthan compensates for the lamentable performance of Tamil Nadu.
Quality of ICR :		Satisfactory	

7. Lessons of Broad Applicability :

- Future dam safety projects must aim at developing efficient investment allocation criteria that include benefit-cost analysis covering evaluation of population, economic assets and other resources potentially at risk.
- Dam safety projects must discriminate between investments needed to maintain structural integrity (i.e. deferred maintenance and the institutional issues that raises) and investments for new works to lower the environmental risk and improve flood forecasting and conveyance capacity .
- Innovative projects need thorough preparation, particularly of new institutions and organizations, and should be piloted first over 2-3 years before embarking on a major investment project .
- State's performance is only likely to improve when disbursement is linked to performance - this suggests that India may benefit from APL-type projects.
- Client satisfaction with Bank's performance does not mean that the Bank is effective in inducing sustainable reform, new institutions and higher levels of efficiency
- In-country ICR workshops provide invaluable feedback, information and raise awareness of development issues - they should be standard for all ICRs .

8. Audit Recommended? ☐ Yes ☒ No

9. Comments on Quality of ICR :

Satisfactory. The feedback from ICR workshop conducted as part of the Intensive Learning Implementation Completion Report was extremely useful . It provides good insight into design and implementation issues affecting this project and will, hopefully, enable better design of similar projects in India . Borrowers' comments were good but a little self-serving.