



1. Project Data:		Date Posted : 09/15/2004	
PROJ ID: P039281		Appraisal	Actual
Project Name: Ghazi Barotha Hydrop	Project Costs (US\$M)	2,250.0	2,067.0
Country: Pakistan	Loan/Credit (US\$M)	350.0	339.9
Sector(s): Board: EMT - Power (100%)	Cofinancing (US\$M)	900.0	
L/C Number: L3965			
	Board Approval (FY)		96
Partners involved : Asian Development Bank (ADB); Japan Bank for International Cooperation (JBIC); Kreditanstalt für Wiederaufbau (KfW); Islamic Development Bank (IDB); and European Investment Bank (EIB)	Closing Date	06/30/2002	10/31/2003
Prepared by :	Reviewed by :	Group Manager :	Group:
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2. Project Objectives and Components

a. Objectives

The development objectives of the project were to: (1) develop domestic energy resources and reduce load-shedding in a cost effective and environmentally sustainable manner, thereby supporting the country's long-term energy development objectives; (2) reinforce and complement the reform program for the power sector; (3) strengthen the capability of the Water and Power Development Authority (WAPDA) to address environmental and resettlement issues related to hydropower projects; and (4) further rationalize the use of electricity.

b. Components

The project components were:

(1) Construction of the Ghazi Barotha Hydropower Project (GBHP) composed of:

- A barrage and ancillary works to divert water from the Indus River into a power channel;
- A 52 km power channel to transmit the water to a power complex.
- A 1,450 MW power complex comprising 5 units each of 290 MW located at the confluence of the Indus and Haro Rivers.
- 500 kV transmission facilities to connect the power house to WAPDA's 500 kV grid (two transmission lines of 100 km between Barotha and Rewat, and about 150 km of loop in-and-out of existing lines between Tarbela and Gatti).

Load flow studies done during project implementation identified the need to add a 500 kV transmission line between Rewat and Lahore, extend the end substations of this line, and add a new 500 kV substations at Gakhar and a 220 kV transmission line between Barotha and Nowshehra. These additions are being financed and constructed by WAPDA under a separate project.

(2) An Environmental and Resettlement and Management Plan.

(3) A power sector reform component involving:

- Setting up GBHP as a separate project entity.
- Establishing a separate transmission and dispatch entity.

(4) A technical assistance component to assist WAPDA in:

- Engineering design, procurement and construction supervision.
- Continued participation of two Panel of Experts, one for technical aspects and one for environmental and social (resettlement) aspects.

- Managing and monitoring the implementation of other components of the project.

c. Comments on Project Cost, Financing and Dates

It took close to 11 years to complete the project –with a delay of 3 years– at a cost 8 percent lower than the appraisal estimate (US\$2,068 million actual, US\$2,250 million appraisal). Cost savings are the balance between a decrease in foreign costs (electromechanical equipment, part of civil works and interest during construction), and an increase in local costs (engineering and administration, and interest during construction). Actual project financing (excluding US\$547.6 million in contingencies, duties and taxes, and consultants and studies) are as follows:

- The Bank (US\$238 million): the 52-km long power channel and ancillary works of the power plant). Moreover, US\$101.1 million of the loan financed goods and services jointly with JBIC. The Bank loan was closed on October 31, 2003 after an extension of the closing date by 16 months, at which time US\$10.1 million was canceled from the loan.
- Bank/JBIC (US\$189.8 million): generators and auxiliary works of the power plant
- JBIC (US\$49.0 million): generators and auxiliaries.
- KfW (US\$68.5 million): penstocks, gates, transformers and auxiliaries, and Scada/telecommunications equipment.
- KfW/JBIC(US\$51.6 million): turbines and auxiliaries.
- ADB (US\$144.9 million): barrage and ancillary works and cranes.
- ADB/IDB (US\$64.9 million): transmission lines.
- EIB (US\$23.4 million): Switchgear, control and protection equipment.
- WAPDA (US\$690.1 million): resettlement villages and all preparatory works comprising access roads and colonies for the power channel and power complex, engineering and administration, and interest during construction

3. Achievement of Relevant Objectives:

The project objectives were partially achieved as follows:

- (1) Domestic energy resources were developed by constructing the 1,450 MW GBHP which is operating at a very competitive generation cost of about 1.7 UScent/kWh –over the life of the project– compared to the average generation cost of 6.0 UScent/kWh for the whole power system. GBHP generated about 4,100 GWh in the past 11 months. Load shedding was largely eliminated (less than 0.5 percent of total generation).
- (2) Reinforcing and complementing the power sector reform program was not achieved: the unbundling of WAPDA into independent entities responsible for generation, transmission and distribution has been under implementation for many years, but has not yet been completed.
- (3) Despite a number of problems, including delays in completing some components, and the difficulties in land acquisition during initial years, the environmental and resettlement program has been almost fully implemented.
- (4) The progress in rationalizing the use of electricity was negligible because the appraisal did not identify or prepare specific components to achieve it. Emphasis was rather placed on addressing the financial situation of WAPDA which, however, was still unsatisfactory at project completion.

4. Significant Outcomes/Impacts:

The most significant project outcomes – mainly physical– include:

- Successful construction, commissioning and commercial operation of: (i) the 1,450 MW GBHP comprising 5 generating units of 290 MW each (water intake, channel and discharge complexes, and the power house); and (ii) the 500 kV transmission facilities comprising the 100-km link between GBHP and WAPDA’s 500 kV grid and the 150-km loop between Tarbela and Gatti.
- Land acquisition and compensation for people affected by the construction and operation of GBHP: (i) about 900 persons were physically relocated involving the construction of about 110 houses; and (ii) about 20,000 persons were impacted by the land acquisition, i.e., all or part of their land holdings were acquired by the project. Recent surveys indicate that more than 90 percent of the people are now able to finance larger and better houses (brick and mortar, and latrine and sewerage facilities) than the previous relatively small mud houses lacking appropriate sanitation facilities.
- Enhanced capability of WAPDA to address environmental and social issues of hydropower projects and prepare and implement resettlement programs This capability is now being used in follow-up hydropower projects (for example, Mangla Raising project).

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

- Full corporatization of WAPDA and separation of hydropower generation from transmission and load dispatch

into separate companies has not yet been accomplished.

- The financial position of WAPDA remained (and continues to remain) poor through most of the past ten years. In 1998, it was realized that WAPDA was unable to contribute its agreed counterpart funding for the project, particularly to pay for land acquisition and portions of civil works contracts. The Bank helped WAPDA by increasing from 70 percent to 90 percent the disbursement to finance the power channel and ancillary works contract.
- Main culprits for the deterioration of WAPDA's finances are: (i) low tariffs (imposed by the Government) for electricity sold by WAPDA compounded with higher prices of electricity purchased by WAPDA from independent power producers (this issue is now being addressed through macro-economic Structural Adjustment Loans and Credits as a follow up to the unsatisfactory outcomes of the 1999-2000 Financial Restructuring Plan and the mid-2002 Financial Improvement Plan); and (ii) operational inefficiencies: high technical and non-technical losses, and high level of accounts receivable. As a result, WAPDA was unable to comply with financial covenants.
- A significant increase in the cost of compensation for land caused long delays in acquisition of land (US\$36.95 million appraisal estimate against US\$116.5 million actual). An investigation carried out by the National Accountability Bureau of Pakistan resulted in arrest and prosecution of a number of officials and persons affected by GBHP.
- The compensation of outstanding claims of 225 persons affected by the Tarbela Dam (who were to receive residential plots) was still pending at time of project completion. This was a Tarbela Dam retrofit added as a sub-component of GBHP. (There were also 1,744 affectees who were entitled to receive cash compensation, which was provided and completed).

6. Ratings :	ICR	OED Review	Reason for Disagreement /Comments
Outcome :	Satisfactory	Moderately Satisfactory	[The ICR's 4-point scale does not allow for a "moderately sat." rating]. Achievement of physical objectives, and 22.5 percent economic rate of return of GBHP resulting in 2.9 benefit/cost ratio at 10 percent discount rate are partly offset by shortcomings in achieving financial, institutional and social objectives.
Institutional Dev .:	Modest	Modest	This takes into account the improvement of WAPDA's capability to implement environmental and resettlement plans.
Sustainability :	Likely	Likely	Based mainly on WAPDA's technical capability to operate and maintain GBHP.
Bank Performance :	Satisfactory	Satisfactory	
Borrower Perf .:	Satisfactory	Satisfactory	
Quality of ICR :		Satisfactory	

NOTE: ICR rating values flagged with '*' don't comply with OP/BP 13.55, but are listed for completeness.

7. Lessons of Broad Applicability:

(1) Deciding to finance a project by assuming funding sources subject to great political and social influences should be carefully analyzed or better avoided at the time of project appraisal. In this project, WAPDA's counterpart funds estimated at appraisal (US\$1,000 million) depended largely on improving the finances of WAPDA through tariff increases and corporatization, two subjects highly susceptible to social and political influences. Because these two assumptions did not fully materialize due to Government intervention, WAPDA was able to contribute only about US\$690 million as counterpart funds.

(2) To avoid conflicts of interest, it does not seem to be a good practice to involve, in new projects, the persons affected in the valuation of land and other assets or charged with retrofitting a past legacy issue. In this case, the valuation of land carried out during project implementation with participation of persons affected led to significant higher valuation than the appraisal estimate by a factor greater than three. This created delays in project implementation and a legal investigation of the way the land was valued. Moreover, the retrofitting of pending compensations for persons affected by the Tarbela Dam did not work. (In response, the region pointed out that the

positive contribution of participatory and consultative approaches for valuing land, income, or other asset losses has been acknowledged in many reviews, e.g., the QAG review of this Project (July 1998), the World Commission on Dams report (November 2000), etc. Similarly, a study by the US GAO (in 1998) observed that the consultative process adopted in GBHP was one of its strengths.)

(3) The potential social impacts of a hydropower development can be reduced by a rigorous evaluation of alternatives, public consultation and awareness building. In the GBHP, the layout of the water channel and location of the barrage and power house avoided consciously existing villages and settlements, even at somewhat higher cost. This reduced the scale of resettlement and relocation without unduly affecting the economic and financial viability of the GBHP.

8. Assessment Recommended? Yes No

Why? Many lessons can be learned regarding the extent to which the intervention of the Bank has improved the power sector of Pakistan, especially in light of the controversial private power projects financed in the 1990s.

9. Comments on Quality of ICR:

The ICR is satisfactory overall. However, it presents a rather long description (24 pages of main text) of project achievement and shortcomings, providing excessive details about physical aspects of project implementation and procurement while lacking detailed information and indicators on sector reform and financial performance of WAPDA. Tables 2 and 3 in the main text of the ICR do not fill the gap of Annex 2 where the Table on Project Financing is missing.