

## **Case Study of a World Bank Project:**

### **Tarbela Dam, Indus River, Pakistan**

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#### Introduction

Earlier class presentations gave a broad overview of International Financial Institutions and of the World Bank's role in negotiating the Indus Waters Treaty. This paper examines a development project (Tarbela Dam) that resulted from the Indus Waters Treaty and was funded by the World Bank. The Tarbela Dam Project is an instructive case study because the project is:

- (1) Well documented, with the original feasibility study and many other reports available for review;
- (2) Old enough that the planning projections can be compared with observed values; and
- (3) Large enough to warrant historical review.

The World Commission on Dams published a comprehensive case study of the Tarbela Dam Project in the year 2000. The present paper relies almost exclusively on the case study for information.

#### Background

In 1947 British India separated into India and Pakistan. India's territory included three tributaries of the Indus River. India decided to withhold water from these tributaries from Pakistan. The World Bank mediated negotiations between the two countries. The result of the negotiations was the Indus Waters Treaty of 1960 which included provisions for a dam on the Indus River to provide reliable irrigation water to Pakistan.

The World Bank established the Tarbela Development Fund to finance construction of the dam. The feasibility study was completed by a team led by Dr. Pieter Lieftinck in 1967. Construction was substantially complete in 1974 but structural issues delayed commissioning of the reservoir until 1976.

## Project Goals

The stated goals of the Tarbela Dam Project were to:

- Provide reliable irrigation water for Pakistan;
- Achieve food security, especially in wheat; and,
- Generate cheap electricity.

The dam succeeded in providing a reliable supply of water. Actual releases were 20% more than predicted because the river produced less sediment than expected. The lower sediment volumes extend the reservoir's useful life from 50 years to 85 years.

The abundance of irrigation water increased the cropping density and new technology increased crop yields. However, crop yields did not reach expected levels and market conditions encouraged farmers to grow cash crops like sugarcane instead of wheat. As a result, Pakistan has imported wheat to satisfy domestic demand.

Electricity production exceeded expected values due to the installation of additional generating capacity. Most Pakistanis are considered to have benefited from the conveniences of electric service. The value of electricity produced at the dam was 41% higher than predicted.

## Resettlement

The resettlement process was one major social problem of the project. The number of displaced persons was actually 96,000 in 120 villages instead of the 80,000 persons in 100 villages that were expected. Only two thirds of directly affected people qualified for replacement land. Replacement land was not always available prior to displacement and the government did not release all of the land allocated for replacement. The displaced population had very little involvement in the resettlement process, and is still extremely unhappy with the project outcomes.

## Environmental Impacts

Environmental effects of the project are difficult to quantify because the feasibility study did not include an Environmental Impact Assessment. Effects due to the dam are especially difficult to pinpoint because Tarbela is just one part of the larger Indus Basin Irrigation System. Most environmental effects are due to the system as a whole, and not just the dam. The primary environmental effects were reductions in fish migration, sediment flow, and peak discharge. The minimum discharge increased because the dam provides irrigation water in the dry season.

## Questions

- With such a mixed bag of effects, should we do these large projects?
- How to value sacrifices of a few for the benefits of many?

### Required Reading

Executive Summary of the Case Study:

[http://www.dams.org/kbase/studies/pk/pk\\_exec.htm](http://www.dams.org/kbase/studies/pk/pk_exec.htm)

### Additional Reading:

The entire report:

<http://www.dams.org/docs/kbase/studies/cspkmain.pdf>