Bohol Irrigation Project (Stage 1)

Report Date: March 2000

1 Project Summary and Japan's ODA Loan

This project aims develop an irrigated area on the island of Bohol in the Philippines to promote agricultural development, consisting of building a dam, irrigation waterways (irrigation canals and drainage canals) and access road, and on-farm development.

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

Borrower	Republic of the Philippines
Executing Agency	National Irrigation Administration (NIA)
Loan Amount	¥4,600 million
Loan Disbursed Amount	¥4,526 million
Date of Exchange of Notes	July 1983
Date of Loan Agreement	September 1983
Final Disbursement Date	March 1998

2 Analysis and Evaluation

(1) Project Scope

The dam spillway was changed from the side-channel type to the bath-tub type for hydraulic reasons. The total length of irrigation canals was reduced for reasons of alignment, and the drainage canals were lengthened for the same reasons, but the area irrigated was largely unchanged. Some of the service access roads were built by the local government, which reduced the portion covered by the ODA loan.

(2) Implementation Schedule

The completion of this project, including the preparation of farms, was delayed for eight years and seven months by irregular weather, shortage of local funding, technical problems (measures to cope with weak soil structures), and poor performance by contractors. For the construction of the dam, the irrigation channels and the drainage channels, the executing agency took measures including changing contractors, to promote implementation, but delayed. The civil engineering works for the irrigation facilities were completed in December 1996, but the farms were still not completed until a year later, in December 1997, because the farmers, seeing the severe delays in the construction of the irrigation facilities, did not begin preparing the farms before the facilities were ready. The measures described in (4). below

meant that the farms were completed in one year, minimizing the delay to the start of the irrigation facilities' operation.

(3) Project Cost

The delays in implementation schedule and the measures taken to solve technical problems (see above) necessitated additional expenditure. In the local currency portion of the project cost was increased by inflation, producing a fourfold increase in project cost. The foreign currency portion of the project cost was increased by additional expenses. Due to the appreciation of the Yen, the Yen-based project cost was largely as planned.

Comparison of Original Plan and Actual

Item	Plan	Actual
1.Project Scope		
・Civil works, development of farm		
Dam		
Type	Earth-fill dam	Earth-fill dam
Crest length	835m	846m
Storage	5,990,000m^3	5,990,000m^3
Spillway	Side-channel type	Bath-tub type
Intake	7.07m^3/sec.	11.8m^3 / sec.
Irrigated area	4,960ha	4,973ha
Irrigation canal (Main /Lateral)	28,290m / 40,030m	26,880m / 35,990m
Drainage canal (Main /Lateral)	34,100m / 88,010m	34,206m / 93,270m
Service access roads	101,200m	78,600m
On-farm development	14,560m / 2,975ha	129,870m / 2,645ha
(farm ditches / land leveling)	(Implemented by beneficiary farmers)	(Implemented by initiative of NIA)
・Consulting Services		
Bidding assistance / Construction management etc.	165M/M	207M/M (original TOR portion) 19M/M (additional TOR (land leveling) portion)
2.Implementation Schedule		
Civil works (dam, main canal)	March 1985 to November 1988	January 1988 to December 1996
Civil works (lateral drainage canal, road)	March 1985 to December 1988	January 1988 to December 1996
On-Farm development (farm ditches / land leveling)	(Implemented by beneficiary farmers)	to December 1997
Consulting Services	March 1984 to July 1988	August 1986 to December 1997
3.Project Cost		
Foreign currency	¥4,600 million	¥4,526 million
Local currency	163.5 million peso	669.4 million peso
Total	¥9,504 million (317 million peso)	¥7,855 million (1,579 million peso)
Exchange Rate	1 peso = ¥30	1 peso = ¥4.973

(4) Project Implementation Scheme

The executing agency was National Irrigation Agency (NIA), with Japanese consultants employed to support NIA in technical matters. The poor performance of the local contractor caused prolonged delays, leading NIA to terminate their contract and hire another contractor (a South Korean company) under a new contract.

The farm preparation (terminal canals and land leveling) was carried out as planned by the beneficiary farmers. However, under the initial plan NIA was not supposed to participate in the farm preparation stage, but NIA rented * its own construction machinery to the farmers. The change was based on the JBIC's advice and guidance to NIA. Making the farmers bear the cost of preparing the farms made them more cost conscious and made the process more efficient. The fact that the fields were prepared in only one year suggests that the JBIC's advice and guidance was appropriate and timely.

* The farmers pay rental charges for the equipment (including costs of operators) to NIA by deferred payment.

(5) Operations and Maintenance

The operations and maintenance of the dam, the irrigation canals, the drainage canals and other facilities is good. However, due to the lie of the land, some of the lateral canals exceed 1km. Therefore, when the volume of irrigation water is being adjusted, the volume at the downstream ends of the canals can be inadequate if the permeability of the canals is not considered. If the lateral canals were lined it would prevent water losses, make it possible to guarantee the amount of water supplied downstream and make maintenance easier.

In the irrigated area the maintenance of the irrigation facilities is handled by 13 water cooperatives with a combined

membership of 2,673 farmers. Under the current contracts between the NIA and the water cooperatives, the cooperatives are responsible for the maintenance of the main water canals, but in future the form of the contracts should be revised so that the water cooperatives own all irrigation facilities and bear all maintenance obligations. That change would encourage farmers to participate in water management and reduce the burden on NIA.

(6) Project Effects and Impacts

The irrigated area was increased from 1,802ha to 4,973ha and the rice harvest increased from 1.7t/ha to 4.5t/ha in the rainy season and from 1.6t/ha to 5.0t/ha in the dry season. This improvement in productivity contributed to improvements in the standard of living in the area.

The EIRR was put at 14.6% in the original plan, but the actual figure was 6.7%. The reduction was apparently due to the nearly fivefold increase in the Peso-based project cost.

3 Lessons Learned

(1) In order to secure the services of high-quality contractors, it is important to improve preliminary appraisal at the procurement stage and performance monitoring at the implementation stage.

The performance of the contractors used in this project for dam construction was inadequate, necessitating a change of contractor and considerably delaying the completion of the project.

In order to avoid such situations, contractors of high quality must be employed. Better prequalification appraisal at the procurement stage is an important first step towards that end. In addition, the performance of contractors must be closely and continuously monitored.

(2) Even in cases where a portion of the project is implemented by the beneficiaries, the executing agency (and JBIC) should include those parts of the project in its monitoring of implementation and provide assistance facilities where necessary.

In this project, a further year was required after the completion of the watercourses and other irrigation facilities before those facilities started working. This delay occurred because, despite the plan for the farms to be prepared by the beneficiaries (the farmers), they made no progress on the preparation work and the farms were not ready before the irrigation facilities were completed. The advice and guidance provided by JBIC, and the help provided by the executing agency succeeded in minimizing the delay, but if the farmers and the executing agency had met at an earlier stage to discuss the farmers' participation and the mobilization of construction machinery and to prepare the farms in a planned manner, the delay could have been avoided. In short, it was necessary to organize the farmers and mobilize the construction machinery in a planned manner.

Thus even if a portion of the project is implemented by the beneficiaries, the executing agency (and JBIC) should include those parts of the project in its monitoring of implementation and monitor the progress made. Under such a system, if a delay was noticed, the implementation method for the part concerned could be changed if necessary, enabling the early completion of the project as a whole and the early realization of its benefits.

Malinao Dam Spillway

Tailend of Lateral Canal

Sluice Gate in Main Canal