

JBIC ODA Loan project Mid-Term Review 2006

Evaluator: Asahi Ltd. (Teruo Kawakami)

Time of Mid-Term Review Field Survey: January 2007

Project Title: The Republic of the Philippines “The Laoag River Basin Flood Control and Sabo Project” (PH-P224)

[Loan Outline]

Loan Amount / Contract Approved Amount / Disbursed Amount: 6,309 million yen / 5,778 million yen / 2,356 million yen (As of the end of September 2006)

Loan Agreement: May 2001 (5 years after L/A signing)

Original Project Completion Date: September 2006

Revised Project Completion Date: June 2008

Loan Expiry Date: September 2009

Executing Agency: Department of Public Works and Highways (DPWH)

Operation and Maintenance Agency: Department of Public Works and Highways (DPWH)

Selection Criteria for Mid-Term Review: Specific Subject (erosion, sediment and flood control)

[Project Objective]

The objective of this project is to 1) construct Sabo dams, 2) construct and repair dikes, and 3) construct spur dikes, 4) construct groundills and 5) construct sluiceways on the Laoag River in the province of Ilocos Norte in northern Luzon for the purpose of addressing 25-year flood probability and reducing flood damage in the Laoag River drainage basin, thereby improving the region's living environment and sanitation, and contributing to its socioeconomic development.

Consultant: Pacific Consultants International (Japan)

Contractor: Package 1: HANJIN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD. (Korea); Package 2: Toyo Construction Co., Ltd. (Japan)

[Mid-Term Review Result]

Item	Ex-ante Evaluation (at the time of appraisal) (March 2001)	Result of mid-term review and ex-post evaluation results as estimated at the time of mid-term review
[Relevance]	<p>(1) National policy level</p> <ul style="list-style-type: none"> • The Medium-Term Development Plan (1999–2004) had the aim of continuing the improvement of flood control facilities mainly in Metro Manila and industrial and agricultural areas in flood prone regions while promoting comprehensive watershed management including forestation. <p>(2) Policy level</p> <ul style="list-style-type: none"> • At the time of appraisal, no comprehensive water control/erosion control plan was in place. <p>This project is based on the Master Plan for the “Laoag River Basin Flood Control and Sabo Project” developed by JICA in December 1997 and the feasibility study (F/S).</p> <p>(3) Planning level</p>	<p>(1) National policy level</p> <ul style="list-style-type: none"> • In the Medium-Term Development Plan (2004–2010), reduction of natural disaster damage is listed among the five strategies in the environment and natural resource sector with the goal of constructing flood control and drainage facilities in all areas affected by flood and drift sand. Therefore, this project remains consistent with the national plan of the Philippines. <p>(2) Policy level</p> <ul style="list-style-type: none"> • In the Regional Development Plan for Region I (2004–2010), major flood management projects are mentioned as measures to be promoted to prevent flood in the growth center of this region and agricultural areas. • Pursuant to Executive Order No. 510 issued in March 5, 2006, the River Basin Control Office was established under the Department of Environment and Natural Resources (DENR). This office is responsible for: 1) working jointly with DPWH to examine appropriateness of water control projects on major rivers; 2) working jointly with DPWH and the National Disaster Coordinating Council (NDCC) to develop a national water control master plan; and 3) examining appropriateness of reforestation plans and setting orders of priority. These tasks are intended to realize comprehensive administration composed of the structure portion such as water control facilities and the non-structure portion such as reforestation. The coordination with DPWH and DENR is an issue to be addressed for the future. <p>(3) Planning level</p>

	<ul style="list-style-type: none"> • In the Laoag River Basin that suffers damage from flood and landslide disasters almost every year, it was urgently needed to implement comprehensive and drastic measures to control flood including the construction of the Sabo dams to prevent inflow of sediments from the upstream of the river and to improve rivers that join the Laoag River. 	<ul style="list-style-type: none"> • After the signing of the ODA Loan Agreement in 2001, the Laoag River Basin was hit by flood and landslide disasters caused by major typhoons such as Igme (June 2004) and Labuyo (September 2005) (Note 1) and therefore this project remains necessary. • On the other hand, due to the topographic changes, large-scale sediment deposition, and destruction of the structures that have been constructed caused by those major typhoons, additional works became necessary. The additional budget is now submitted for approval. The office in charge of the preliminary review (the National Economic and Development Authority (NEDA)) demands, in light of the establishment of the above-mentioned River Basin Control Office, the executing agency to cooperate with DENR and local governments as a condition for the recommendation to ICC concerning approval of the additional budget, saying that the water control structures that are planned to be constructed would not work unless the issue of forest loss in the hinterland, which is the root cause of incessant floods, is addressed. (Based on this advice, the executing agency is requesting the local government (Ilocos Norte Provincial Government) to exchange a Memorandum of Agreement (MOA) on the cooperation in water control administration. However, there are issues to be solved prior to executing MOA, such as the establishment of the structure to cooperate with municipalities in the basin, allocation of necessary personnel, budget determination, and cooperation with DENR.
<p>Effectiveness (Impact)</p>	<p>(1) Operation and effect indicators</p> <p>1. Quantitative effects</p> <p>1) Monitoring indicators</p> <p>On extending the ODA Loan, JBIC and DPWH agreed that DPWH will conduct monitoring of the operation and effect indicators after the project completion shown in the table below, which was prepared based on the values present in the feasibility study (1996).</p>	<p>(1) Operation and effect indicators</p> <p>1. Quantitative effects</p> <p>1) Proposed operation and effect indicators for monitoring</p> <p>The executing agency indicated an intention to modify the effect indicators among the indicators subject to monitoring after the project completion as follows to reflect the price rise, increases in population and income, increase in buildings, etc. during the 1996–2006 period (reply from the</p>

	Scale of Flood	10-year Probable Flood		25-year Probable Flood	
		At Present	After Project	At Present	After Project
Operation Indicators	Peak Flow Rate (m³/s)	8,900	8,900	10,900	10,900
	Peak Water Level (EL.m)	9.06	9.06	9.90	9.90
Effect Indicators	Amount of Damage (million pesos)	559	20	696	31
	Number of Houses Damaged	10,000	1,750	12,100	2,270
<p>(Note)</p> <ul style="list-style-type: none"> In this project, operation indicators of peak flow and water level are not expected to change after the project completion because 1) flood control facilities such as dams do not exist, and 2) upstream inundation is not included in the assumption. In this project, necessary repair and construction works are carried out only in the priority areas (urban areas). Therefore, the damage caused by a 25-year probable flood would not be reduced to zero. 					
<p>3) EIRR 16.7%</p> <p>Costs: Cost of river repair and construction of river facilities, increase in the operation and maintenance cost resulted from the implementation of the project</p> <p>Benefits: Reduction in the estimated total amount of damage (amount of</p>					

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Operation Indicators	Peak Flow Rate (m³/s)	8,900	8,900	10,900	10,900
	Peak Water Level (EL.m)	9.06	9.06	9.90	9.90
Effect Indicators	Amount of Damage (million pesos)	1,180	42	1,466	65
	Number of Houses Damaged	13,000	2,280	15,400	2,900

executing agency to the inquiry).
As mentioned in the sections of relevance and efficiency, the executing agency is currently applying for approval of the government for the additional budget. The values for after the project are estimated on the assumption that the additional budget will be approved as it is and the project will be implemented as planned.

2) EIRR
• The NEDA Secretariat calculated EIRR after the execution of the additional budget at 14.8%.

Costs: Cost of river improvement and construction of river facilities, increase in the operation and maintenance cost resulted from the implementation of the project

	<p>damage caused by a smaller flow rate than that of a 25-year probable flood)</p> <p>2. Qualitative effects Flood damage will be reduced and the living environment in the target region will improve. Regional socioeconomic development will be accelerated.</p>	<p>Benefits: Reduction in the amount of flood damage, prevention of land loss, recovery of land utilization, negative benefits, and the benefits brought by the restoration of irrigation facilities in the project target region</p> <p>2. Qualitative effects</p> <p>1) After the completion of the project, reduction in the flood damage is expected to help substantially decrease diarrhea, etc. transmitted through or caused by water, and the epidemic mortality and morbidity rates of local residents including infants are expected to decline. In the City of Laoag adjacent to the Laoag River, the construction of dikes will alleviate the fear of flood damage and as a consequence economic activities will be activated with the construction of houses and commercial facilities.</p> <p>2) Agricultural production increase effect (impact) As an effect other than the reduction in the amount of damage included in the monitoring indicators, when the Ilocos Norte irrigation system is restored with the completion of the project, agricultural production is expected to increase by 660 million pesos on an annual basis as a result of the construction of Sabo dams and the irrigation diversion weir. However, the cost of restoration of irrigation facilities is not covered by the additional budget under review this time. This effect will be generated if irrigation facilities are restored by NIA in the near future. (The damage caused by typhoon Igme to the irrigation facilities to be covered by such project includes sediment deposition in irrigation canals over 14 km in length and destruction of 5 intake dams (headworks). If DPWH carries out the restoration work, it would cost 508 million pesos. The intake dam of the Madogaon River is half destroyed and the irrigation canal near the dam is also damaged. They need to be addressed urgently in order to realize an increase in agricultural production by the restoration of the irrigation system which makes a large part of the effects of this project.)</p>
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		<p>in the future.</p> <ul style="list-style-type: none"> • Compliance of EMP (Environmental Management Plan) required under ECC <p>Mostly complied</p> <p>(3) Factors which may influence the sustainability</p> <ul style="list-style-type: none"> • As mentioned in the section on relevance, with the aim of realizing comprehensive water control administration, the River Basin Control Office was established in DENR to engage in comprehensive implementation of flood control measures such as the construction of water control structures under the jurisdiction of DPWH and forestation and other works under the jurisdiction of DENR not involving structures such as forestation. In this regard, NEDA requested DPWH to cooperate with DENR and local governments in flood control works other than the construction of structures as a condition for the review of the additional budget and also advised to seek cooperation of local governments in securing the budget for the maintenance of water control facilities. Also, as the diversion weirs and drainage weirs constructed at 26 sites under the project are scattered over the basins of the Laoag River and its branches, establishment of the system for their operation and maintenance such as emergency opening and closing in the event of flood is being considered including transferring the operation and maintenance function from DPWH to local governments as well as seeking understanding and cooperation of local residents. It is desirable that such system will be established and reinforced at an early date.
Information for reference		
[Efficiency]	<p>(1) Outputs</p> <ul style="list-style-type: none"> • Civil engineering 1. Construction of Sabo dams (5) 	<p>(1) Outputs</p> <ul style="list-style-type: none"> • Although there is no change in the outputs, design change was necessitated due to the large-scale sediment deposition and changes in

	<p>2. River improvement at the lower reaches (construction and repair of dikes over approximately 13 km in total)</p> <p>3. Improvement of alluvial fan rivers in the middle reaches (construction and repair of dikes over approximately 40 km in total, construction of spur dikes)</p> <ul style="list-style-type: none"> • Amount of consulting services estimated at the time of ex-ante evaluation: 558 M/M <p>(2) Project period May 2001 – September 2006 (65 months)</p> <p>(3) Project cost 6,309 million yen (2,253 million pesos) Total project cost approved by the Government of the Philippines: 3,004 million pesos (ODA Loan portion: 2,253 million pesos (6,309 million yen (1 peso=2.8 yen); Philippines Government's: 751 million pesos)</p>	<p>the river conditions caused by major typhoons, as already mentioned, and additional works are needed (extension of open levees, strengthening of the dike slopes and consolidation of foundation, etc.). The additional budget is being submitted for approval as mentioned in the section of relevance.</p> <ul style="list-style-type: none"> • Amount of consulting services necessary for completion as estimated at the time of the mid-term review: 642 M/M (115% of the planned amount) <p>This increase is caused by the delay in project implementation and the increase in the period of construction supervision for the additional works that became necessary due to the damage from typhoons.</p> <p>(2) Project period May 2001 – June 2008 (scheduled) (85 months) (131% of the planned period)</p> <p>The delay is mainly caused by the delay in the procurement procedure (process for selecting contractors) and additional works that became necessary due to the damage from major typhoons.</p> <p>(3) Project cost The executing agency is now applying for approval for the additional budget of 1,828 million pesos over the total project cost. It includes 1,717 million pesos for the construction cost, 124 million pesos for consulting services, 30 million pesos for land acquisition, 10 million pesos for the management cost, and 61 million pesos for the contingency for inflation, less the reduced amount of the physical contingency 116 million pesos (according to calculation by NEDA. The total of each item is not equal to the total amount because of rounding errors.) However, ICC Secretariat of NEDA issued a recommendation that DPWH should promote</p>
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		cooperation with DENR and the local government, saying that flood damage in this region should be reduced not only by carrying out the works covered by the additional budget but also by establishing comprehensive measures in the flood control project, and also advised DPWH to promote cooperation with local governments (11 bodies including the province, cities and towns) in the operation and maintenance of flood control facilities after completed.
Lessons Learned and Recommendations	<ul style="list-style-type: none"> For proper and sustainable operation and maintenance of water control facilities scattering over a wide area, it is essential to establish a structure for cooperation among DPWH, DENR and local governments (state, city, town and village). Such system needs to be established as soon as possible. In connection with the foregoing, it is important to implement reforestation of the hinterland as part of the non-structure portion of the comprehensive administration of water control which is to be realized, in order to ensure sustainability of water control facilities constructed under this project and generate further effects of the project. Therefore, the executing agency is advised to consult with DENR, which is the department in charge, and local governments at an early date and develop an implementation plan. 	
Indicators set for use at time of ex-post evaluation	<p>Operation indicators:</p> <ul style="list-style-type: none"> Peak flow rate (m³/s) Peak water level (EL.m) <p>Effect indicators</p> <ul style="list-style-type: none"> Amount of damage (million pesos) Number of houses damaged 	<p>Operation indicators:</p> <ul style="list-style-type: none"> Peak flow rate (m³/s) Peak water level (EL.m) <p>Effect indicators</p> <ul style="list-style-type: none"> Amount of damage (million pesos) Number of houses damaged

(Note 1) Damage from typhoons

	2001 (Typhoon Felia)	2002	2003	2004 (Typhoon Igme)	2005 (Typhoon Labuyo)
Flood frequency	15 years	No record	No record	20 years	12 years
Flood duration	12 hours	No record	No record	48 hours	24 hours
Amount of damage to agriculture, irrigation facilities, bridges, road,	1.5 billion pesos	No record	No record	2.48 billion pesos	109.5 million pesos

etc.					
Damage to houses	767 completely destroyed, 2702 half destroyed, 5471 submerged	No record	No record	38 completely destroyed, 151 half destroyed, 14197 submerged, 797 isolated	No record
Flood casualties	1 died, 2 missing, 14 injured	No record	No record	No record	No record