Ex-Post Project Evaluation 2010: Package IV-6
The Republic of the Philippines

December 2011

JAPAN INTERNATIONAL COOPERATION AGENCY

IC NET LIMITED

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Preface

Ex-post evaluation of ODA projects has been in place since 1975 and since then the coverage of evaluation has expanded. Japan's ODA charter revised in 2003 shows Japan's commitment to ODA evaluation, clearly stating under the section "Enhancement of Evaluation" that in order to measure, analyze and objectively evaluate the outcome of ODA, third-party evaluations conducted by experts will be enhanced.

This volume shows the results of the ex-post evaluation of ODA Loan projects that were mainly completed in fiscal year 2008, and Technical Cooperation projects and Grant Aid projects, most of which project cost exceeds 1 billion JPY, that were mainly completed in fiscal year 2007. The ex-post evaluation was entrusted to external evaluators to ensure objective analysis of the projects' effects and to draw lessons and recommendations to be utilized in similar projects.

The lessons and recommendations drawn from these evaluations will be shared with JICA's stakeholders in order to improve the quality of ODA projects.

Lastly, deep appreciation is given to those who have cooperated and supported the creation of this volume of evaluations.

December 2011
Masato Watanabe
Vice President
Japan International Cooperation Agency (JICA)

Disclaimer

This volume of evaluations, the English translation of the original Japanese version, shows the result of objective ex-post evaluations made by external evaluators. The views and recommendations herein do not necessarily reflect the official views and opinions of JICA. JICA is not responsible for the accuracy of English translation, and the Japanese version shall prevail in the event of any inconsistency with the English version.

Minor amendments may be made when the contents of this volume is posted on JICA's website.

JICA's comments may be added at the end of each report when the views held by the operations departments do not match those of the external evaluator.

Ex-Post Project Evaluation 2010:

Package IV -6 (The Republic of the Philippines)

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The Republic of the Philippines

Ex-Post Evaluation of Japanese ODA Loan Project
Metro Manila Flood Control Project – West of Mangahan Floodway

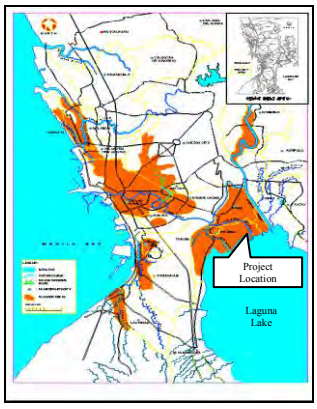
External Evaluator: Kinuko Mitani, IC Net Limited

0. Summary

The project objective is to mitigate flood damages which are caused by the high water level of Laguna Lake, by improving the inland drainage system, dike, and bridge near the Lake, thereby contributing to the enhancement of the living conditions of Metro Manila and the Rizal Province.

The project is highly relevant to the Philippines's development plan and development needs. It is also in line with Japan's official development assistance policy for the Philippines, thus increasing its relevance. The project, which has reduced the flood damages in the project area, has been effective and has had a positive impact on local communities: 93% (response rate) of the residents in the project area claimed that their living conditions have improved because of the project. Thus the project's impact is high. The project cost slightly exceeded the planned cost, while the project period significantly exceeded the planned period; therefore, the project efficiency is low. Moreover, the project sustainability is considered fair owning to certain problems related to the organizational and financial aspects of operation and maintenance. Overall, the project, which was jointly evaluated by the Japan International Development Cooperation and the National Economic and Development Authority of the Philippines, is rated as partially satisfactory.

1. Project Description



Project location

Developed bridge in the project

Developed pumping station in the project

1.1 Background

Metro Manila is the economic and political center of the Philippines, and hit by typhoons and floods every year, which rapidly increase rainfall level. As a result, floods are developed in the area. The Japan International Cooperation Agency (JICA) has implemented projects in the areas of flood control and drainage system, with high priority given to Metro Manila. Particular examples are projects related to flood control and drainage system and flood forecast and warning system.

The water level of Laguna Lake, which is located southeast of Metro Manila, rises during the rainy season, particularly during heavy rainfall due mainly though not limited to typhoons in the West of the Mangahan area (land area of approximately 39km^2, population of approximately 500,000, land use classification of residential, commercial, and agricultural). As a result, this area suffers from frequent inundation damage.

Metro Manila was greatly affected by a typhoon occurred in November 1988. Extensive flooding was created due to a typhoon in November 1995, and severely damaged the Mangahan area. During this flooding, 150,000 residents were affected by over 1 meter of inundation.

To improve the situations highlighted above, the need to implement projects on flood control targeting Metro Manila was very high. Therefore, the Government of the Philippines (GoP) petitioned JICA for loan assistance given the experience and knowledge of flood control, which the Government of Japan (GoJ) has.

1.2 Project Outline

The project objective is to mitigate flood damages by developing lakeshore dike, pumping stations and bridge(s) in the West of Mangahan area located in the north side of Laguna Lake, Metro Manila, thereby contributing to the enhancement of the living conditions of residents in the area.

Loan Approved Amount/ Disbursed Amount	9,411 million yen/ 8,958 million yen
Exchange of Notes Date/ Loan Agreement Signing Date	March 1997/ March 1997
Terms and Conditions	Interest Rate: 2.5% Repayment Period: 30 years（Grace Period: 10 years） Condition for Procurement: General Untied
Borrower/ Executing Agency	The Government of the Republic of the Philippines/ Department of Public Works and Highways
Final Disbursement Date	June 2008
Main Contractor	Kubota Cooperation (Japan)・Shimizu Corporation (Japan)(JV), Taisei Corporation (Japan)・Ebara Corporation (Japan)(JV),

	Daewoo Engineering and Construction Co. Ltd. (Korea), China International Water and Electric Corp. (China)
Main Consultant	CTI Engineering Co., Ltd. (Japan)・Regional Planning International Co., Ltd. (Japan)・Basic Technology and Management Corporation (Philippines) ・Wood Fields Consultants, Inc. (Philippines)(JV)
Related Studies (Feasibility Study：FS）etc.	The Metro Manila Flood Control Master Plan (1990) and the feasible study of prioritized projects
Related Projects	<Yen loan project> • North Laguna Lakeshore Urgent Flood Control and Drainage Project • Post Ondoy and Pepeng Short-Term Infrastructure Rehabilitation Project

2. Outline of the Evaluation Study

2.1 External Evaluator

Kinuko Mitani, IC Net Limited

For this project, a joint evaluation was conducted with the National Economic and Development Authority (NEDA), the Philippines.

2.2 Duration of Evaluation Study

Duration of the Study: January- December 2011

Duration of the Field Study: March 29-April 20, June 13-July 12, September 25-October 4, 2011

2.3 Constraints during the Evaluation Study

During the ex-post evaluation, the external evaluator attempted to collect data related to flood damages (inundated area, affected population, damage costs, etc) in the project area from the Department of Public Works and Highways (DPWH), Metro Manila Development Authority (MMDA), local government units (LGUs) in the project area, and other relevant organizations. However, these organizations do not retain any detail record of the flood damages limited to the project area. Therefore, the evaluator relied on the results of the interviews with LGUs and residents in the project area to evaluate the project's effectiveness. The evaluator also reflected the limited data that were available related to flood damages in the project area. The physical conditions of the facilities developed by the project such as four pumping stations, floodgates, bridges, dikes, etc. were evaluated by visual inspection and interviews as well as the interview with the Operation and Management (O&M) responsible persons. Owing to the limited study and budget, structural deterioration and disturbance were not assessed in a quantified manner.

3. Results of the Evaluation (Overall Rating: C[1])

3.1 Relevance (Rating: ③[2])

3.1.1 Relevance with the Development Plan of the Philippines

At the time of the appraisal, the Medium-Term Philippine Development Plan (1993-1998) gave high priority to infrastructure development and disaster management as ways to reduce flood damages. The Metro Manila Flood Control Plan was developed in 1990 by the DPWH, including project formation and implementation of flood control and drainage development in the West of Mangahan area. The plan to reduce flood damages comprising three stages spread across thirty years for project implementation. The first stage (1991-2000) consists of four projects; the second stage (2001-2010), seven; and the third stage (2011-2020), five.

During the ex-post evaluation, the current Medium-Term Philippine Development Plan (2011-2016) states that the total flood-prone area is approximately 2,780,000 hectares (ha), equivalent to 9% of the Philippines' total land area[3]. The GoP has set the goal that 50% of the flood-prone area be converted to flood protected area by 2016 (see Table 1). According to the plan, the DPWH sets the following goals for infrastructure development:

- Place adequate flood control and drainage facilities;
- Pursue nonstructural measures for flood mitigation (flood forecasts, early warning system, evacuation plan, etc); and
- Coordinate with LGUs and secure flow-down capacity of river channel, floodways, and so on by protecting flood control and drainage facilities.

Table 1: Data related to flood control in the Philippines

Indicator	Amount
Total flood prone area (ha)	2,778,692
Flood protected area (ha) (2003)	579,264
Target flood protected area (ha)	1,393,312

Source: Medium-Term Philippine Development Plan (2011-2016)

The DPWH was implementing other Japanese loan projects in the field of flood control in Metro Manila at the time of the ex-post evaluation. Specifically, the DPWH has been involved in the Post Ondoy and Pepeng Short-Term Infrastructure Rehabilitation Project since 2009, and Pasig-Markina River Channel Improvement Project (II) since 2007.

Therefore, the project has been consistent with the development policy of the GoP from the time of the appraisal to the time of the ex-post evaluation. At the time of the ex-post evaluation, the current Medium-Term Philippine Development Plan also illustrated the importance to continue assisting matters related to flood control.

[1] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

[2] ③: High, ②: Fair, ①: Low

[3] When 2,780,000 hectares is converted to square kilometer, it becomes 27,800. According to the Ministry of Foreign Affairs, Japan, the total Philippines' land area is 299,404 square kilometers.

3.1.2 Relevance with the Development Needs of the Philippines

At the time of the appraisal, Metro Manila was hit by typhoons and heavy rainfall every year. As a result, the area developed large-scale flooding. As shown in Table 2, the floods that occurred in the project area between 1990 and 1996 not only caused significant loss of lives and damage to property but also affected the development and economic viability of the project area. Therefore, the necessity and urgency of assistance in the field of flood control was severe.

Table 2: Flood damages during 1990's in the project area

Flood damage		1990	1992	1994	1996
No. of typhoons occurred in the Philippines		10	7	13	10
In the project area	No. of typhoon hit	5	4	2	2
	No. of affected houses	All: 222,831 Partly: 634,676	All: 222,066 Partly: 630,855	All: 14,596 Partly: 44,472	All: 715 Partly: 6,809
	No. of affected families	1,135,433	296,453	70,107	182,112
	No. of affected persons	6,092,959	1,464,989	343,849	878,901
	No. of death due to floods (person)	660	86	48	77
	Damages amount (million peso)	12,457	3,974	1,433	2,120

Source: National Disaster Risk Reduction and Management Council (August 2011)

At the time of the ex-post evaluation, flood damages were reduced to some extent in the project area; therefore, the relevance of the development needs in the field of flood control in the project area was severe at the time of appraisal as well as ex-post evaluation.

3.1.3 Relevance with Japan's ODA Policy

The Country Assistance Program (1997) stated that the GoJ would give high priority to 1) basic economic infrastructure development, 2) strengthening of industrial structure and agricultural development, 3) poverty alleviation and improvement of basic living conditions, and 4) environmental protection. In particular, disaster mitigation was addressed as an important issue in environmental protection. Similarly, the Country Assistance Program (2000) emphasized environmental protection and disaster management as one of the four most critical areas for assistance. The objective was to provide assistance in disaster management in the Philippines so that communities and the environment in affected areas were protected from frequent natural disasters.

Similarly, the Japan Bank for International Cooperation[4] (1999) gave high priority to environmental projection including disaster management as well as the strengthening of the Philippines economy toward achieving sustained growth and overcoming growth constrains. Hence, the project has been consistent with the GoJ and JICA's policy for assistance to the Philippines at the time of the appraisal.

For the above reasons, the project has been highly relevant with the Philippines' development plan and development needs, as well as Japan's ODA policy. Therefore, its

[4] At the time of the project appraisal, JICA and JBIC were not yet merged. Hence, JBIC document was referred.

relevance is high.

3.2 Efficiency (Rating: ①)

3.2.1 Project Outputs

Civil works and consulting services were planned and implemented in the project. These components were covered by the Japanese loan portion. The DPWH was the executing agency of the project. The following are the actual outputs per component.

(1) Civil Works

The civil works consisted of four packages and resettlement site development. Table 3 shows the planned scope and actual outputs. Packages 1 and 2 include changes, and Packages 3 and 4 include additional works. Description and reasons for the changes are as follows:

- Package 1: Length was added to the Lakeshore Dike. Capacity of two regulations ponds was reduced. These changes were made to reduce the number of affected residents in the project area. The DPWH contracted the National Hydraulic Research Center, which is attached to the University of the Philippines as a third party to study the community needs in the project area and to prepare an alternative plan of the scope based on the findings of the study. Additionally, a decision was made to upgrade the Napindan River Bridge instead of the Mangahan Floodway Bridge in line with the above change in the scope.
- Package 2: Within the scope of the Napindan River Dike, the east bank of the earth dike was reduced by approximately one-half, and the parapet wall was reduced to 88%. The rationale for the changes was the same as that for Package 1, namely, to reduce the number of affected residents in the project area.
- Package 3: Construction of a small fishermen's wharf next to the Taguig Pumping Station was added based on the request of a local fishermen's group in the project area. According to the interviews with the DPWH, LGUs, and local fisherman's group, the DPWH and fishermen's group were consulted regarding the design of the wharf[5].
- Package 4: Construction of the San Agustin Pumping Station was added as per the request of local LGUs in the project area. The additional scope in Packages 3 and 4 was realized in response to the requests expressed by the local LGUs and the residents in the project area.

[5] There was no memorandum between the DPWH and the fisherman's group. Hence, whereabouts of equipment procured and O&M structure of the wharf agreed could not be reviewed. During the ex-post evaluation, there was no longer any wharf where it was constructed during the project implementation. According to the fisherman's group, it was destroyed by typhoons.

Table 3: Civil works – plan and actual

Facility	Plan	Actual
＜Package 1＞		
Lakeshore Dike	Length 9.5km Crest elevation: EL15m	Length 10.8km As planned (partly constructed at 14m according to the change in scope)
2 Bridges	1) Mangahan Floodway Gates 2) Napindan River Bridge	1) Omitted 2) As planned
4 Regulation Ponds - Capacity	1) Tapayan 141,000m^3 2) Labasan 80,000m^3 3) Taguig 101,000m^3 4) Hagonoy 58,000m^3	1) 119,000m^3 2) As planned 3) 99,000m^3 4) As planned
＜Package 2＞		
Napindan River Dike	1) Earth dike: 0.3km (East bank)+0.1km (West bank), EL14.6m 2) Parapet: 5.8km, EL14.1m	1) 0.12km (East bank)+0.1km (West bank), EL14.6m 2) 5.16km, EL14.1
Floodgates	4	As planned
＜Package 3＞		
Tapayan Pumping Station	Submersible motor pump 3m^3/s（3 units, 9m^3/s capacity）	As planned
Labasan Pumping Station	Submersible motor pump 3m^3/s（3 units, 9m^3/s capacity）	As planned
Floodgate	2	As planned (Additional Scope) Fisherman's wharf near the Taguig Pumping Station
＜Package 4＞		
Taguig Pumping Station	Submersible motor pump 3m^3/s (4 units, 12m^3/s capacity)	As planned
Hagonoy Pumping Station	Submersible motor pump 3m^3/s (2 units, 6m^3/s capacity)	As planned
Floodgate	2	As planned (Additional scope) San Agustin Pumping Station

Source: Executing agency

The changes in the scope of the civil works, as previously outlined, were made to reflect the requests expressed by the communities in the project area, such as the fishermen's groups and the informal settlers. The DPWH placed importance on the social impact of the project within the project area. As a result, the number of individuals negatively affected by the project was reduced, and no negative effects were found.

Resettlement site development was planned as part of the civil works, but was not implemented. According to the DPWH, the followings are the status of the resettlement site development. During the project implementation, the DPWH announced the project to allot the resettlement site already developed for use. The DPWH explained that the need to develop a new resettlement site was greatly reduced, and it was omitted. At the same time, the DPWH financially compensated the residents as indicated in Table 4. Thus the need to provide a resettlement site was eliminated (451 households were eligible for compensation).

Compensation was made to 154 households before project completion. The remaining 297 households have not yet received compensation due to a shortage in DPWH funding. Of the 922 households that were subject to relocation, 919 households received compensation. Compensation was only available to households who could provide legal land titles.

Regulating informal settlers before and during the project implementation period was a difficult task. A major challenge for the executing agency was to determine the most efficient method to relocate and resettle this population in a humane manner[6].

Table 4: Resettlement compensation payment status

Items subject to compensation	Eligible Households for compensation	Households received compensation
Land acquisition	451	154
Constructions	922	919

Source: DPWH (September 2011)

(2) Consulting Services

The consulting services were composed of 1) a review of the detailed design and tender documents, 2) assistance in tendering, 3) construction supervision, 4) study on the land development plan, and 5) transfer of technology and experience. The services were provided as planned. Owing to an extension of the civil works component, the consulting services were also extended. As shown in Table 5, the Man/Month (M/M) of the national consultants was significantly higher when compared with the M/M of the international consultants.

Table 5: Consulting services – plan and actual

M/M	International	National
Plan	245	1,375
Actual	251	1,994
Ratio (%)	102	145

Source: DPWH's responses to the questionnaire (July 2011)

3.2.2 Project Inputs

3.2.2.1 Project Cost (Sub-rating: ②)

The planned project cost was 12,548 million yen (of which 9,411 million yen corresponds to the yen loan portion). The actual project cost was 13,188 million yen, and exceeded by 5% against originally planned.

When examined the project cost in Philippine peso, the actual cost for civil works significantly exceeded the planned and the revised planned cost. The actual cost for land acquisition was slightly higher, although the actual cost for administration was slightly lower. Overall, the actual project cost significantly exceeded the planned cost in peso. However, the

[6] According to the DPWH, no further information is available related to the households, which were not yet paid as shown above.

actual project cost overrun was minimum in yen[7] owing to yen appreciation during the project period.

As shown in Table 5 above, the international portion of the consulting services was most likely provided as planned. Although the national portion of the services significantly exceeded the planned M/M, the negative influence to the project was minimized due to yen appreciation.

The civil works of the project was reduced to 73% of the original plan. Additional scope was implemented in Packages 3 and 4. Thus it is appropriate to revise the planned project cost and compare the actual cost against the revised planned project cost. The reduced project cost was 402 million yen, and the additional cost was 122 million yen. The revised planned project cost was 12,268 million yen as the result of reflecting the changes above. When compared to the actual project cost of 13,188 million yen (8,958 million yen as yen loan portion), the actual cost exceeded by 7% from the original plan, thereby, slightly exceeded the revised project cost.

3.2.2.2 Project Period (Sub-rating: ①)

The planned project period was from March 1997 to January 2004 (83 months). The actual period was from March 1997 to August 2007 (126 months). Hence, the actual period exceeded by 52% from the original plan, thereby, significantly exceeded the planned period.

The project was suspended for six months from November 2001 to April 2002. According to the DPWH, issues related to a rapid increase of informal settlers in the project area had to be resolved in a participatory manner. Public hearings were organized to understand better the community needs, and an alternative design of the Lakeshore Dike was proposed. Other factors that delayed and extended the project included procurement of contractors, land acquisition as well as bad weather conditions, which interrupted construction works. Similarly, natural calamities such as typhoons, heavy rains, floods, and natural disasters were identified as the cause of extension and delay of the project period. As shown in Table 6, the main reasons for the extension of the project period were the delayed procurement of contractors and prolonged implementation period of the civil works Package 1. The extension of the project period caused a delay in securing and enhancing the flood control capabilities of the project area.

Table 6: Project period – principal reason for delay/extension

Scope	Plan	Actual	Principal Reasons	Gap
Procurement of contractor	February 1998-January 1999 (12 months)	June 1998-March 2001 (34 months)	Selection of contractors	22 mos.
Civil works (Package 1)	February 1999-September 2004 (68 months)	August 2000-August 2007 (85 months)	Change in the scope	17 mos.

Source: DPWH (July 2011)

[7] The exchange rate applied in calculating the actual cost, average rate from 1997 to 2007 was 1 peso=2.58 yen. The exchange rate was 1 peso=4 yen at the time of the project appraisal. During the project period, yen was significantly appreciated.

For the above reasons, the project cost slightly exceeded the planned costs, and the project period significantly exceeded the planned project period. Therefore, the project's efficiency is evaluated low.

3.3 Effectiveness[8] (Rating: ③)

3.3.1 Quantitative Effects

3.3.1.1 Results from Operation and Effect Indicators

It is ideal to compare and analyze flood damages on the project area before and after the project to assess the project effectiveness. Indicators such as number of affected families and properties, damage situation, lake water level, and inundated area are appropriate to evaluate effectiveness. According to the DPWH, the MMDA and LGUs in the project area at the time of the ex-post evaluation, no record of flood damages such as the indicators listed above specific to the project area was available. Therefore, flood damages due to typhoons in the project area before and after the project were examined using available data of the National Risk Reduction and Management Council. As shown in Table 7, the numbers of affected families prior to the project intervention were 4,186 in 1995, 632 in 1998, and 61,942 in 2006. Upon termination of the project in 2007, the number was 200[9]. In the years following the termination of the project the numbers of affected families were 54 in 2008, 9,315 in 2009, 826 in 2010, and 3,358 in 2011. Scale and intensity of typhoons vary from one to another, making comparison by random selection difficult. It is possible, however, to observe a general tendency. For example, the total number of families affected by the two typhoons prior to the project (2006) was 61,942 whereas the number of families affected by two typhoons posterior to the project (2011) was 3,358. According to an explanation by a local expert in flood control, *61,942* families affected in 2006 could have been reduced by half should a measure similar to the project had been taken. As for the flood in 2011, damages could have been larger without the project intervention. This allows us to consider that the project has had enough effect.

The scale of Typhoon Ondoy, which hit the project area in 2009, was far beyond the expected scale of flooding that the facilities developed in the project cope with. Hence, the damages related to Typhoon Ondoy are not reflected in Table 7.

[8] Dimension of the project's impact is added when rating the project's effectiveness was determined.
[9] Both the project completion and two floods developed in the project area were taken place in August 2007.

Table 7: Recent flood damage in the project area

Year	No. of Typhoon occurred	No. of affected barangay	No. of affected family	No. of affected house	No. of casualty
1995	1	No data*	4,186	No data	0
1998	3	No data	632	No data	0
2006	2	29	61,942	31,329	5
2007	2	7	200	0	0
2008	1	2	54	0	0
2009	3	8	9,315	No data	0
2010	1	5	826	0	2
2011	2	5	3,358	No data	0

Source: National Disaster Risk Reduction and Management Council (August 2011)
*No data indicates no data was recorded since levels of damages were minimal.

The following is an analysis of flood damages in the project area due to Typhoon Ondoy as a case study (see Table 8). The typhoon caused 1,030 casualties, affected 185,004 houses, and created 11 billion peso[10] in damages. Typhoon Ondoy was one of the worst typhoons to ever hit in the Philippines and severely affected the country from both economical and human view points.

Table 8: Flood damages due to Typhoon Ondoy in the project area

Indicator	Situation at the time of Typhoon Ondoy in the project area	Project impact – if the project was not implemented
Lake water level	The expected maximum lake water level for the project was elevation 13.8 meters. When Typhoon Ondoy hit the project area, the level was recorded as elevation 14 meter. The crest elevation of the lakeshore dike was 15 meters*, so that extra 1 meter was secured. Hence, damages caused by flooding in the project owing to overflow of Laguna Lake was reduced.	Typhoon Ondoy brought large-scale rainfalls, which was described as one in 150-year event. Therefore, the flood damages could have been much worse without the project, particularly so in the project area including Metro Manila, the nation's political and financial center.
Situation after flooding	Main reason for flooding was overflow of Markina River, which runs through the project area including Metro Manila, as well as lack of adequate drainage system in the project area.	As illustrated above, the scale of flood damages would have been larger without the project.
	Inundation period was approximately 2 weeks.	Inundation period could have been up to 6-7 months without the project.

*In some areas the crest elevation of the lakeshore dike is 14 meters.

For the above reasons, the facilities developed in the project are contributing factors for reducing the loss of lives in the project area. Similarly, the project was considerably effective for the reduction of flood damages in the project area even when the volume of rainfalls was much more than the GoP predicted.

3.3.1.2 Results of Calculations of Internal Rates of Return (IRR)

The Economic internal rate of return (EIRR) at the time of the appraisal was 17.7%. When it

[10] Source: Situation Report No. 50, National Disaster Coordinating Council

was re-calculated at the time of the ex-post evaluation, it had increased to 21.3%. The increase is most likely due to the increased population and houses in the project area, as well as the increased price of real estate, which contributed to improvement of the economic benefits. The conditions of the recalculation were the same as those conditions at the time of the appraisal:

- Life of project: 40 years
- Cost: project cost
- Benefit: reduced flood damages amount (discharge level of below 40-year return period)

3.3.2 Qualitative Effects

The qualitative effect of the project was to mitigate flood damages in the project area by developing dikes, bridges and pumping stations. The results of the interviews with the LGUs in Pasig City and Taguig City and a beneficiary survey[11] that targeted the communities in the project area were studied to evaluate the project effectiveness and impact.

Interviews were conducted on the basis of the questionnaire prepared for the communities in the project, who were the project beneficiaries. Participants chose from two to five optional responses on the questionnaire. With regard to the question "What is the extent of improvements in living conditions in the project area because of the project?," 46% of the respondents selected improved considerably, 47% selected improved slightly, and 7% selected no change. In other words, 93% of the respondents considered the effect of the project to be high. The main factors that accounted for the project's effectiveness were the development of the facilities identified as needs in the communities in the project area and reduced flood damages due to improved O&M effectiveness of the facilities, to some extent. The main qualitative impacts of the project which were confirmed during the beneficiary survey are shown below.

Indicator	Response
Observed number of annual flooding from Laguna Lake	Decreased considerably 61% Decreased slightly 28% No change 6%, Increased 5%
Extent of flooded area	Decreased considerably 53% Decreased slightly 32% No change 10%, Increased 5%
Observed flooding duration in days	Decreased considerably 58% Decreased slightly 30% No change 8%, Increased 4%
Extent of damages of lives and properties	Decreased considerably 55% Decreased slightly 33% No change 8%, Increased 4%
Improvement in access to market/ basic services	Yes 94% No 6%

[11] Beneficiary survey was conducted in the project area, using random sampling approach. 125 persons were interviewed during the survey. The questionnaire used during the survey was developed by the external evaluator, and the response style was a combination of multiple choice and narrative form.

Based on the results of interviews with LGUs, it was verified that the project has clearly contributed to reducing flood damages in the project area to large extent. In particular, loss of lives and properties in the outside area of the lakeshore dike (inland side) has decreased. Even when flooding occurred, the project has significantly reduced the inundation period. The satisfaction level with the project was very high among the LGUs in the project area. The project has complimented the LGUs' flood management efforts, such as the issuing of warnings and setting up of evacuation centers in the project area. However, flooding has not completely stopped in the project area (inland side) owing to external factors such as an insufficient/under-developed drainage system, solid waste accumulated in the waterways, limited capacity to absorb rainwater in the project area.

In summary, the project has largely achieved its objectives: therefore, its effectiveness is high.

3.4 Impact

3.4.1 Intended Impacts

According to the results of interviews with LGUs and beneficiary survey conducted in the project area, the project's impact was assessed and illustrated as follows. The LGUs and communities in the project area indicated that their communities are safer and more assured during rainy season owning to the facilities developed in the project. Majority of the beneficiaries in the project area indicated that flood damages were reduced after the project completion; therefore, they no longer faced major difficulties in carrying their daily economic activities. As a result, negative impact due to flood damages was mostly prevented.

The following responses indicated that the project brought positive impact to the project area.

(1) Improvement of living conditions owing to reduced flood damages in the project area

The beneficiary survey conducted in the project area showed that 46% (response rate) felt that their overall living conditions had considerably improved because of the project, 47% felt it had improved to some extent, and 7% felt there was no change. The following figure outlines other questions and the beneficiaries' responses. These responses also indicated an improvement in the living conditions in the area, thus, the project is considered to have had a positive impact on the project area.

Question	Response
How do you feel safe/assured from fear from flooding after the project completion?	Highly assured 64% Slightly assured 30% Not assured 6%
How were your risks reduced during flooding after the project completion?	Highly reduced 49% Slightly reduced 44%, Not reduced 7%

Was flood risk reduction leading to increase your income after the project completion?	Substantially increased 52% Slightly increased 34% No increase 14%
Was your access to market/basic services improved after the project completion?	Yes 94% No 6%
Was there any improvement in health situation in the area after Flood Control Project completion (i.e., sanitation and reduction of incidence in water borne diseases, etc)?	Yes 72% No 28%

(2) Economic growth of the project area

According to the results of interviews with LGUs and beneficiary survey conducted in the project area, the project's impact was as follows.

Based on the result of interview to Pasig City, which is one of the cities in the project area, classification of land use has changed since 1990. In 1990, there was 10% increase in land use as residence and commercial buildings, as a result, the percentage increased from 65 to 75. Such percentage is expected to increase to 87 by 2020. Hence, it can be said that land value as residence and commercial buildings in Pasig City is increasing.

Figure 1 showed that 54% felt disruption of economic activities after the project was *decreased considerably*, 35% felt *decreased slightly*, 9% felt *no change*, and 2% felt *increased*.

In regard to net household income, more than half of the respondents felt *increased to some extent.* According to the DPWH and Metro Manila Development Authority (MMDA[12]) that accompanied the external evaluator when site inspection of the facilities developed in the project was conducted, number of small shops and taxi service providers has been increased. Although this increase is not realized owning to any planned land use, observed phenomenon evidences the development of residence and commercial facilities.

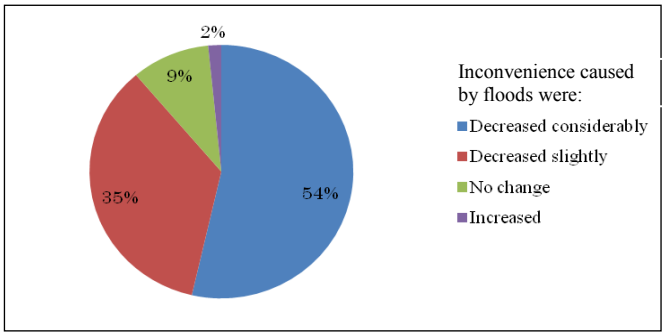


Figure 1: Responses to the beneficiary survey on the living environment in the project area

Source: Beneficiary survey at ex-post evaluation (September 2011)

As the result of interviews with LGUs and beneficiary survey conducted in the project area, the lakeshore dike constructed in the project has been utilized as a communal road among the

[12] MMDA is an organization, which is responsible for planning and implementation of development projects for 17 government organizations belong to Metro Manila. In particular, the MMDA provide assistance in the field of traffic, water management, climate change, and disaster managements. Time to time, roles of the MMDA and LUGs were unclear.

local communities as unexpected impact of the project. DPWH has been planning to construct a ring road (named C-6). At the time of the ex-post evaluation, such road had not been constructed. The communities in the project area are using the dike as a road. Hence transportation time has been reduced within the project area; thereby distribution of goods has become easier.

Had the project not been implemented, reduction of loss of lives and properties would not be realized. Hence negative impact on economic growth in the project area would have been found. Therefore, it can be said that the project reduces flood damages such as loss of lives and properties, thereby is contributing to economic growth in the project area.

3.4.2 Other Impacts

The other impacts of the project are as follows.

(1) Impact on the natural environment

The interviews were conducted with the LGUs, Laguna Lake Development Authority (LLDA), Department of Environment and Natural Resources, and the communities. Based on the responses from the interviews, no major environmental hardship was found related to noise, dust, or vibration caused by the civil works. That is, no negative impact was reported regarding noise, vibration, or pollution from traffic after the project completion. However, the increase in traffic in the project area may be considered a future air pollution threat from an environmental view point.

Laguna Lake Environmental Monitoring Report 2007[13], which is annually published by LLDA stated that there was no problem with the water quality of Laguna Lake when dissolved oxygen[14] was analyzed from 2004 to 2006. At the time of the project appraisal, an environmental protection group raised desalinization of the Lake as a potential concern.

Reasons for finding no relationships between the project and desalinization are as follows:

- No floodgate was neither planned nor conducted along the Pasig-Markina River in the project. Thus, there was no factor to lower functionality of the Mangahan Floodway, which connects Laguna Lake and Pasig as well as Markina River.
- Napindan Hydraulic Control Structure (NHCS) was developed with assistance of the Asian Development Bank, and its objective is different from this project. The objectives of NHCS are 1) to improve water quality of Laguna Lake by preventing backflow of saltwater and sewage from Pasig River, 2) to manage passing and draining of the lake water, and 3) to reduce flood damages in Manila city by preventing flow of water from Laguna Lake to Pasig River when Pasig River gets flooded.
- The floodgates constructed in the project were closed only when flooding. Frequency of the

[13] It was published in 2006.

[14] Dissolved oxygen is oxygen, which soluble in bodies of water. Dissolved oxygen volume is affected by pressure (low), water temperature (high), salinity (high), and so on. In bodies of highly contaminated water, oxygen gets reduced, which is required for organic compounds to consume oxygen. As a result, lives of fish and shellfish are threatened (source: weblio dictionary – translated from Japanese to English by the external evaluator).

gate closure was low.

The Environmental Compliance Certificate (ECC), reissued in October 2005 in accordance with the project's scope of public works, introduced modifications such as changes in the project name and amplification of soil range for rehabilitation of flood and drainage system from 10.9 km to 11.7 km.

(2) Land Acquisition/Resettlement

The project required land acquisition and resettlement in the project area. Land was acquired using a phase approach, and land acquisition began after the project's implementation was initiated. The affected population in Lupang Arenda, which is within the project area, significantly increased when compared with the plan. As a result, land acquisition in the area became extremely difficult. According to the DPWH, approximately 2,000 families were expected to be affected by the project. After project implementation, however, more than approximately 20,000 families were affected by the project. The rapid increase may be related to the compensation payment offered to affected families. The significant increase may also be due to the wide coverage of the project area, which is along Laguna Lake. The executive agency is held responsible for creating such situation. However, it was thought that this situation could not be easily solved or sorted out

A local university, being a third party to the project, was invited by DPWH to warrant impartiality as well as accountability for the local resident by providing accurate explanation on the project objectives. The involvement of a third party was appropriate as understanding and consent were obtained from the residents. Although unexpectedly lengthy process of land acquisition negatively affected the efficiency in project implementation, it led to conservation of livelihood in the project area and a smooth completion of public works thereafter. The efforts of attaching importance to the social concerns are worth noting as being adequate.

The DPWH decided that legal residents are subject for relocation owing to land acquisition. Compensation was paid, according to the asset values of lands and constructions, to residents who could provide land titles as required condition. Compensation was made according to the DPWH, 154 out of 451 cases have been subject to compensation and the remaining 297 are expected to be in the future. As for buildings, compensation to 919 out of 922 cases has been conducted[15]. Insufficient funding is among the principal reasons for the uncompensated cases. No follow-up study is made by DPWH on the resettlement of compensated households. Hence, no data is available in regard to these unpaid households.

[15] The DPWH did not know whether any compensation was paid to the remaining three cases. Hence, the actual status of compensation payment to these 3 cases could not be found.

(3) Land development use

The project prepared a Land Use Development Plan (draft) as part of the consulting services. The plan suggested that 10 hectares of available land be set aside for development into recreational grounds to provide a place for the population of Metro Manila to relax it. According to the LGUs in the project area, the population in the project area is increasing; however, whether this phenomenon is related to the project is unclear. In addition, according to the interviews with the DPWH and the MMDA, unplanned and unauthorized development is taking place in the project area. Both the DPWH and the MMDA do not hold any legal rights either to authorize or restrict land use in the project area. Thus, the DPWH and the MMDA, along with the LGUs, must develop a platform that addresses unplanned development. If unplanned development continues to proceed in the project area, the scale of flood damages will most likely rise.

For the above reasons, the project has reduced flood damages in the project area, thereby, has contributed to the improvement of living conditions within the communities in the project area.

3.5 Sustainability (Rating: ②)

3.5.1 Structural Aspects of Operation and Maintenance

At the time of the appraisal, the regional office (National Capital Region or Region IV-A) of the DPWH was slated to be responsible for O&M on the project completion. According to the O&M plan, it was expected that the DPWH's knowledge, technology, and equipment would be utilized. However, responsibilities related to flood control operation in Metro Manila were re-defined according to the presidential order. As a result, management responsibility of flood control in Metro Manila, which was under the regional office of the DPWH, was moved to the MMDA umbrella. Thereafter, the whole O&M responsibilities of the facilities developed in the project were shifted to the MMDA at the time of the project completion.

The O&M status was studied at the time of the project ex-post evaluation. The external evaluator found out that the MMDA was not conducting O&M on the dikes and bridges as shown in Table 9. The reason was thought was inadequate human capacity and material resources to carry out O&M activities of the lakeshore dike and the bridge[16]. As one of the tentative solutions to this problem, the DPWH may be able to assist in O&M of the dike and bridge.

LGUs in the project area are not part of the O&M structure. Thus, their role in the project is unclear. As a result, no collaboration with LGUs in waste management ever occurred. Specifically, the MMDA does not own trucks to collect waste from the pumping stations;

[16] As a related background, there is also a fact that the administrative jurisdiction of MMDA is limited to Metro Manila. Hence, MMDA was not able to carry out O&M activities in Rizal Municipality, which is a part of the project area. MMDA had also limited funds for the O&M of the flood control facilities turned-over by DPWH, which affected its O&M activities.

therefore, it cannot dispose waste collected at the pumping stations. Improvised waste collections with borrowed DPWH trucks have been reported in the past. In conclusion, the roles and responsibilities of the DPWH, the MMDA, and concerned LGUs in the field of flood control in Metro Manila have not been cleared. It is therefore pertinent to specify each organization's responsibilities to secure an efficient O&M structure.

As previously discussed, the memorandum of agreement (MOA) signed between the DPWH and MMDA had not been realized at the time of the ex-post evaluation. Primarily, the O&M activities are expected to be conducted as per the MOA. If it is difficult to enforce the agreed O&M structure, collaboration in O&M of the facilities between the DPWH and the MMDA is thought as acceptable.

Table 9: Plan and the current situation of O&M Structure

Facility	At completion (2007)	At ex-post evaluation (2011)
Dikes	MMDA	No O&M conducted
Bridges	MMDA	No O&M conducted
Regulation Ponds	MMDA	MMDA
Floodgates	MMDA	MMDA
Pumping Stations	MMDA	MMDA

Source: Executing agency

3.5.2 Technical Aspects of Operation and Maintenance

According to the DPWH and the MMDA, officers dispatched to the pumping stations have basic day-to-day O&M technology skills and knowledge. These officers were trained on O&M by the DPWH before the project completion; therefore, their technical expertise is likely to be at the required level.

With regards to the electronics of the equipment installed in the pumping stations (i.e., engines and control panel) by the project, the O&M system is designed as such that the providers of the equipment facilitate necessary services. Therefore, the MMDA immediately requests the provider for reparation and/or parts exchange when malfunction is reported as a way of the O&M of the pumping stations.

Up to the time of ex-post evaluation, the MMDA conducted exchange/repair works when breakage occurred to the facilities developed in the project. This reactive approach of the O&M system works only when minimum repair work is required. According to the MMDA, there had not been very few repair works required from the project completion to the time of the ex-post evaluation. To be prepared for unexpected malfunctioning of the facilities, it is best to enhance risk management capacity by improving technical skills.

3.5.3 Financial Aspects of Operation and Maintenance

The MMDA agreed to be fully responsible for the O&M of the facilities developed in the project at the time of project completion. The MMDA allocated the Flood Control and Sewerage

Management Office funds for O&M from 2008 to 2012 as shown in Table 10. At the time of the ex-post evaluation, the MMDA was responsible for the O&M of fifty-four pumping stations including the four stations developed by the project.

Table 10: MMDA annual budget summary – O&M for flood control

Unit: 1,000 peso

Year	O&M	Capital outlay	
	Flood control	Urgent disaster	Flood control (NCR)
2008	42,818	50,000	53,863
2009	25,397	36,199	52,283
2010	238	38,724	147,013
2011	8,958	50,000	58,000
2012	7,406	50,000	58,000

Source: MMDA (July 2011)

As shown above, the capacity of the O&M budget for flood control has been decreasing every year except for 2010. The O&M budget for 2012 amounted to approximately 17% of that of 2008. The MMDA does not allocate O&M funding exclusively for the fifty-four pumping stations that it is fully responsible for. The MMDA transfer of funds from other O&M funds when conducting repair works to the pumping station(s) is necessary. Only because no major repair works have been requested up to now, has the MMDA not faced any major issues. It was verified that no budget is allocated to promptly attend the troubles detected at the pumping facilities. The external evaluator detected that an approval for equipment procurement has been put on hold for more than half-a-year within MMDA, and found that no budget has been allocated for the purchase.

3.5.4 Current Status of Operation and Maintenance

According to an assessment by the MMDA and the visual inspection of the facilities, the conditions of the facilities are mostly in good condition. The areas for improvement are as follows.

(1) Pumping stations (including the floodgates and regulation ponds)

According to the visual inspection of the pumping stations, the facilities are in good conditions for the most part, although some equipment needs to be replaced with new equipment. Although the MMDA is expected to attend to the issue as soon as possible, procurement of equipment (i.e., request for purchase of equipment) is a long process, beginning with approval within the MMDA[17]. Fortunately, since 2009, there has not been a typhoon of the scale of Typhoon Ondoy[18] to hit the project area. In addition, no major flood damages have

[17] The request for purchase of equipment was submitted for approval in February 2011, and was not yet approved in July 2011.

[18] The scale of Typhoon Ondoy exceeded the project's projection considerably. Hence, damages caused by Typhoon Ondoy would be considered as exception, thereby, detail review of such damages was not conducted during the ex-post evaluation.

occurred owing to malfunctions in the pumping station(s), which has reduced the critical need to procure equipment. The MMDA has used alternative goods to temporarily fix the problems, which has been a positive factor in reducing risk.

The number of water hyacinth has increased enormously in the regulation ponds as shown in the photo below. Because of the water hyacinth, the ponds' capacities have reduced, which now poses a problem. Further, waste from the nearby areas of the pumping stations also flows into the regulation ponds. During the rainy season, the MMDA had to collect and remove the waste, which was more than the designed capacity, affecting the regular functionality of the pumping stations. At the time of the ex-post evaluation, it was found that a coordination mechanism in waste management had not been arranged and established. This problem is severe, and the MMDA is expected to attend to it.

Generally, LGUs are responsible for waste management in the Philippines. However, the LGUs in the project area had not been collecting waste from the waterways and the regulation ponds regularly. The MDMA has been collecting it instead. The MDMA and Taguig City, located in the project area within Metro Manila, have a good relationship. Taguig City collects waste from the Taguig Pumping Station. This arrangement can be adopted to Pasig City and other areas. MMDA needs to enhance the collaboration with the LGUs to raise the awareness of the communities in flood control, information exchange, and update status.

Figure 2: Water hyacinth grown in the regulation pond

Based on the responses from interviews with MMDA, the water level has been measured based on a fixed method by officers at the pumping stations. MMDA closes the floodgate when the water reaches 12 meters. Some members of the communities and LGUs have requested a revision to the level at which the floodgate is closed. After consultation with DPWH on this matter, DPWH explained the relevance of the water level according to its experiences in flood control. The pumping stations outside the project area of this project also follow the same water level for closure of floodgates. The engineer of MMDA responsible for O&M of the pumping facility explains that operating the pumping facility at 12 meter-high water level is not optimum for preventing flood in the project area. Rather, releasing the flood control at 11.5 meter is considered adequate. A scientific study had not been conducted at the time of the ex-post evaluation; therefore, the relevance of the set water level cannot be confirmed. The adequacy of the water level may be modified if necessary.

(2) Lakeshore Dike

According to the LGUs in the project area, the Lakeshore Dike was partly collapsed when Typhoon Ondoy hit the area in 2009. The damage caused the worst flood damages in Pasig City. Typhoon Ondoy hit the project area at the scale at which the GoP was not prepared, because it

was beyond the designed capacity of flood control facilities in the Philippines and elevated the water of the rivers and lakes to very high levels. DPWH has been implementing the Post Ondoy and Pepeng Short-Term Infrastructure Rehabilitation Project.

(3) Service road

Big pot holes were found along the service road developed in the project due to deterioration of the road conditions. The road was designed to connect the four pumping stations in the project area, but is currently utilized as an essential road for the community members[19]. The road is also used to transport construction goods by private companies for building houses and commercial buildings in the area. This has led to traffic volume beyond planned capacity, which is the reason of its deterioration. The DPWH is expected to assess the road's conditions and complete repair work as necessary.

Figure 3: Service road developed in the project

For the above reasons, some minor problems have observed in terms of the structural and financial aspects of the O&M. Therefore, the project's sustainability of the project effectiveness is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The project objective was to improve the living conditions of residents in the in the project area by reducing the flood damages caused by typhoons and heavy rains that occur every year in West Mangahan. West Mangahan is located in Metro Manila. Therefore, the relevance of the project implementation in the area is high. The efficiency, however, is low because the actual project cost was slightly higher than originally planned, and the actual project period was significantly longer than originally planned. Because of the facilities developed by the project, flood damages have been reduced in the project area, therefore the effectiveness is high. As a result, the living conditions of the project area have also been improving; therefore, the impact is high as well. Some unstable factors have been observed in terms of the structure and finance of the O&M of the project; therefore the sustainability of the project effect is fair. In the coming months, discussion on confirmation and/or re-establishment of the most adequate O&M structure(s) in the project area shall be immediately organized between the DPWH and MMDA, additionally with concerned LGUs.

In light of these factors, the project is evaluated to be partially satisfactory, since the project period significantly exceeded the plan, although the expected outputs were mostly realized.

[19] The DPWH paved the road independently.

4.2. Recommendations

4.2.1 Recommendations to the Executing Agency

As discussed in 4.1. Conclusion, there are some problems have been observed in terms of the structure and finance of the O&M of the project. Therefore, between the DPWH and MMDA, additionally with concerned LGUs, discussion on confirmation and/or re-establishment of the most adequate O&M structure(s) in the project area shall be organized. Similarly, it is expected that not only roles of these organizations shall be clearly defined, but also these organizations shall be held responsible for the given roles.

Furthermore, the DPWH is expected to work with MMDA who is responsible for O&M as follows:

- Secure adequate budget specific to O&M of the flood control facilities, including risk management of pumping stations (i.e., preventive maintenance, purchase and storage of spare parts).
- Expedite necessary internal procurement procedures and promptly procure parts that need to be replaced at pumping stations.
- Establish a coordinated mechanism with LGUs: 1) work with MMDA and Pasig City to establish a coordinated mechanism in waste management in the project area; 2) work with MMDA and Taytay Municipality to form a joint coordination mechanism in water hyacinth management in the regulation pond(s).

Similarly, it is important to establish a supporting system upon discussion that meets financial, personnel, and material needs, at least at minimum level with involvement of the LGUs in the project area, so that the project's sustainability is secured.

4.2.2 Recommendations to JICA

It is recommended that JICA, jointly with the Philippines side, monitors the progress of the O&M structure (including financing) enhancement for the facilities developed in the project.

4.3 Lessons Learned

(1) Land acquisition and resettlement

When any executing agency of project(s) require consensus-building related to land acquisition and resettlement, appropriate explanation to concerned community members and organization of public hearing(s) at an early stage of project implementation are relevant. It is important to involve academia/expert(s) such as local university, and is essential to invite a large number of beneficiaries to public hearing(s) for information sharing. In the project, the DPWH requested that the University of the Philippines conduct a study to understand better the needs of the communities in the project area. Because of the study, part of the scope of the civil works was modified. This is a good example of the executing agency giving high importance to social

consolidations in the project area.

(2) Sustainability

- Establishing an appropriate O&M structure at the time of project completion is very important. It is especially critical to plan and establish a new and sustainable O&M structure by careful analysis of consequences when an executive agency of project goes through organizational reform during project implementation.
- Conducting O&M activities of facilities developed under project(s) more effectively, not only the LGU whose technical and financial capacities are not stable, but the central government of the Philippines shall also take part when necessary.

(3) Flood related data

Adequate indicators shall be set when a project in the field of flood control is formulated in the future. Necessary data according to the indicators set shall be monitored and recorded regularly.

Comparison of the Original and Actual Scope of the Project

Item	Plan	Actual
1.Project Outputs		
Package 1		
Lakeshore dike	Length 9.5km Crest elevation EL15m	Length 10.8km Crest elevation EL15m
2 bridges	①Mangahan Floodway Bridge ②Napindan River Dike	①Omitted ②As planned
4 regulation ponds - capacity	①Tapayan - 141,000m^3 ②Labasan - 80,000m^3 ③Taguig - 101,000m^3 ④Hagonoy - 58,000m^3	①Tapayan - 119,000m^3 ②Labasan - As planned ③Taguig - 99,000m^3 ④Hagonoy - As planned
Package 2		
Napindan river bridge	①Earth dike ②Parapet	①Earth dike ②Parapet
Floodgate	4	As planned
Package 3		
Tapayan pumping station	Submersible motor pump 3m^3/s (3 units, 9m^3/s capacity)	As planned
Labasan pumping station	Submersible motor pump 3m^3/s (3 units, 9m^3/s capacity)	As planned
Floodgate	2	As planned (Additional scope) Fisherman's wharf near Taguig Pumping Station
Package 4		
Taguig pumping station	Submersible motor pump 3m^3/s (4 units, 2m^3/s capacity)	As planned
Hagonoy pumping station	Submersible motor pump 3m^3/s (2 units, 6m^3/s capacity)	As planned
Floodgate	2	As planned (Additional scope) San Agustin Pumping Station
＜Resettlement Site Development＞		
No. of resettlement sites	4 sites (maximum)	Omitted
Total resettlement area	4 ha (maximum)	
Water supply	20 units deepwell (maximum)	
Electric supply	For 142 housing units (maximum)	
Road network	3.5km long and 5-7 wide (maximum)	
Housing unit requirement	142 units (maximum)	
＜Consulting Services＞		
M/M	International: 245M/M National: 1,375M/M	International: 251M/M National: 1,994M/M
2. Project Period	March 1997-January 2004 (83 months)	March 1997-August 2007 (126 months)
3. Project Cost		
Foreign currency	8,541 million yen	8,589 million yen
Local currency	4,008 million yen (Local currency 1,002 million peso)	4,600 million yen (Local currency 1,783 million peso)
Total	12,548 million yen	13,188 million yen
Japanese ODA loan	9,411 million yen	8,958 million yen
Exchange rate	1 peso＝4 yen (As of May 1996)	1 peso＝2.58 yen (Average during of March 1997～August 2007)

The Republic of the Philippines

Ex-Post Evaluation of Japanese ODA Loan
Cordillera Road Improvement Project

External Evaluator: Ryujiro Sasao, IC Net Limited

0. Summary

The objective of this project is to promote transportation for people and materials and improve the efficiency and reduce the costs of shipping by improving main roads in the Cordillera region in the mountainous area of north-central Luzon. Since the project suits the Philippines' development policies and development needs and is in agreement with the aid policies of the Japanese government, the relevance is high. It also is highly effective since the volume of transportation on project roads has increased steadily, local residents' access to various facilities has improved, and travel time has decreased. Furthermore, the project is having a gradual impact on the local economy, for example by increasing volumes of agricultural produce shipped by farmers in the vicinity of the project road and increasing numbers of tourists.

However, the efficiency of the project has been evaluated as fair due to a lengthening of the project period. There also are some issues that require improvement in road conditions and maintenance as well, and as such the sustainability of the effects realized by the project is fair.

For the above reasons, the project can be evaluated to be satisfactory.

1. Project Description

Project Location

Part of the Cordillera Road

1.1 Background

The Cordillera Administrative Region (consisting of the six provinces of Abra, Benguet, Ifugao, Kalinga, Apayao, and Mountain Province) in north-central Luzon is a mountainous region in which about 70% of the surface area (1.83 million ha) consists of rugged mountains. It is the source of the rivers that flow through northern Luzon. While its main industry is mining and manufacturing, which accounted for 58% of the region's total output of 50.7 billion pesos (1997), about 60% of the region's population of 1.25 million (1995) were engaged in agricultural production of produce such as rice and highland vegetables.

The administrative region has formulated a Cordillera Regional Development Plan intending to promote agriculture, mining and manufacturing, and tourism and to eradicate poverty through increasing income and expanding employment opportunities. However, development of basic infrastructure such as roads and telecommunications has been slowed in the region by its precipitous terrain. There was a pressing need to develop a safe and efficient road network in order to promote and vitalize the economy in the administrative region, through linking focal points in provinces in the region and promoting transportation of materials and people to and from major cities outside the region.

1.2 Project Outline

The objective of this project is to promote transportation for people and materials and improve the efficiency and reduce the costs of shipping by improving main roads in the Cordillera region in the mountainous area of north-central Luzon, thereby contributing to promoting and vitalizing the economy in the region and improving the welfare of its residents.

Loan Approved Amount/ Disbursed Amount	5,852 million yen/5,522 million yen
Exchange of Notes Date/ Loan Agreement Signing Date	December 1999/December 1999
Terms and Conditions	Construction: Interest Rate: 1.8%, Repayment Period: 30 years (Grace Period: 10 years), Multiple conditions Consulting/services: Interest Rate: 0.75%, Repayment Period: 40 years (Grace Period: 10 years), Multiple conditions
Borrower/Executing Agency(ies)	Government of the Republic of the Philippines/Department of Public Works and Highways (DPWH)

Final Disbursement Date	March 2008
Main Contractor	China GEO Engineering Corporation (People's Republic of China)/Cavite Ideal International Construction & Development Corp. (Philippines)
Main Consultant	Pacific Consultants International (Japan)/Philipp's Technical Consultants Corp (Philippines)/Design Science Incorporated (Philippines)/Urban Integrated Consultants Inc. (Philippines) (JV)
Feasibility Studies, etc.	Conducted by the Philippines
Related Projects	Technical cooperation: Dispatch of JICA experts to the DPWH (Road Department)

2. Outline of the Evaluation Study

2.1 External Evaluator

Ryujiro Sasao, IC Net Limited

For this project, a joint evaluation was conducted with the National Economic and Development Authority (NEDA).

2.2 Duration of Evaluation Study

Duration of the Study: January - December 2011

Duration of the Field Study: March 29 - April 18, June 8 - 25, September 25 - October 9, 2011

2.3 Constraints during the Evaluation Study (if any)

No particular constraints

3. Results of the Evaluation (Overall Rating: B[1])

3.1 Relevance (Rating: ③[2])

3.1.1 Relevance with the Development Plan of the Philippines

At the time of the appraisal, the new Medium-Term Development Plan (covering the years 1999 - 2004) formulated by the Estrada administration had established the development objective in the transport sector of supporting the socioeconomic development of the Philippines through provision of safe and reliable transport services, and strategies identified for the achievement of this objective included (1) lessening government participation in road development and promoting use of the private sector, (2) improving the quality of existing infrastructure through appropriate repairs and maintenance, and (3) introduction of appropriate legal frameworks and price policies to develop competitive markets. Achieving a high standard in main national highways and decentralization of road-network

[1] A: Highly satisfactory; B: Satisfactory; C: Partially satisfactory; D: Unsatisfactory

[2] ③: High, ②: Fair, ①: Low

development were identified as priority items toward achievement of strategy 2 in particular, and this project corresponds to such an effort to achieve a high standard in national highways.

In the Cordillera Administrative Region, the Cordillera Regional Development Plan 1999-2004 was formulated with the aims of promoting agriculture, mining and manufacturing, and tourism and eradicating poverty through increasing income and expanding employment opportunities. A Cordillera Road Improvement Program is addressed specifically in this development plan, and as such this project is relevant to the plan.

At the time of the Ex-Post Evaluation, the midterm infrastructure development plan (covering the years 2011 - 2016) formulated by the DPWH identified the following as objectives in the road sector:

"The main objectives of the DPWH are to improve the public's access to products and services and enhance the safety and international development of the road network, through maintenance, improvement, and expansion of the nation's road network in an efficient, environment conscious way."

In addition, the Cordillera Administrative Region Updated Regional Development Plan, 2008-2010 notes that the percentage of national highways that were paved had risen from 31% in 2003 to over 34% in 2007, thanks to implementation of World Bank and JICA projects. The plan established the objective of increasing this ratio to 40% by 2010.

In this way, even after the implementation of this project, improvements to the transportation network remain important. As shown by policies at the time of the appraisal and later, both the government of the Philippines and the Cordillera Administrative Region have continually recognized the importance of improving the main roads in the Cordillera Administrative Region, and as such this project can be said to be highly relevant to the country's development plan.

3.1.2 Relevance with the Development Needs of the Philippines

The road network is a weakness in the Cordillera Administrative Region (about 80% of the national highways in the region were unpaved), and often traffic on main roads was cut off by damage from natural disasters. There was a need for steady improvement in the network of main roads, as basic infrastructure. The Baguio - Aritao road covered by this project is a main east-west thoroughfare linking Baguio, a central city in the Cordillera Administrative Region, with the most important main road, Philippine-Japan Friendship Highway which traverses the Philippines from north to south. The project road passes through steep and mountainous area and the quality of the road was very poor. With a high level of development effects in increasing the efficiency of transport of agricultural produce and improving access to social services, it was expected to improve the living environment of residents in the vicinity, including many ethnic minorities.

As shown by the operation and effect indicators under "Effectiveness" below, the volume of traffic on the project road is increasing steadily. In addition, the total population of the Cordillera Administrative Region and its number of registered vehicles are increasing over time so that the presence of development needs can be confirmed at the time of ex-post evaluation as well.[3]

[3] While the total population was approximately 1.25 million in 1995, in 2007 it was approximately 1.52 million. The number

In this way, the development needs were clear at the time of the appraisal and have been verified statistically at the time of ex-post evaluation as well, and as such the project is relevant with development needs.

3.1.3 Relevance with Japan's ODA Policy

According to the appraisal materials, JICA had a policy of supporting improvement to the economic infrastructure in areas such as transportation in order to eliminate bottlenecks to economic development, for the purpose of securing sustainable growth in the Philippines. In improvements to the main road network in particular, already efforts had been focused on improvements to north-south road networks, in consideration of the geographical structure of the Philippines as a long country from north to south, including the Philippine-Japan Friendship Highway project. Subsequently, a policy had been adopted to improve main roads linking east with west and peripheral roads on islands, in addition to north-south roads, to encourage balanced land development.

The overseas economic cooperation implementation policy released at about the same time as the appraisal included the following passage:

"3. Country-Specific Aid: (v) Philippines

The focal points of aid for the sustainable growth in the Philippines will be on strengthening the economic structure of the Philippines as well as alleviating poverty and rectifying regional disparities, which are leading factors limiting growth, and on aid contributing to environmental protection measures including disaster prevention and aid in areas such as human-resources development and development of systems."

The Cordillera Administrative Region is an area where the poverty rate is higher than the average in the Philippines,[4] and this project is relevant with the overseas economic cooperation implementation policy.

For the above reasons, this project has been highly relevant with the Philippines' development plan and development needs, as well as Japan's ODA policy. Therefore its relevance is high.

3.2 Efficiency (Rating: ②)

3.2.1 Project Outputs

The purpose of this project is to improve the road and bridges between Baguio and Aritao (total distance: approximately 101 km).

(1) Civil Engineering

(Major scope)

- Paving, bridge repairs, protecting slopes, etc., on the road between Baguio and Pangawan.
- Paving, bridge repairs, protecting slopes, etc., on the road between Pangawan and Aritao.

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of registered vehicles (including motorcycles) was approximately 51,000 vehicles in 2003 and approximately 73,000 in 2009.

[4] According to the Japan Bank for International Cooperation's Poverty Profile of the Philippines (July 2008)

Since the subject roads pass through very steep terrain, countermeasures against disaster need to be conducted fully, and the project scope included slope protection construction. Since widening of roads would be dangerous in numerous locations, the number of lanes was set at one and emergency shelters were set up where needed (as planned).

Original plan and actual performance of civil engineering and main causes of changes are shown in Table 1 below. All changes are considered to have been necessary for achievement of project goals.

Table 1: Comparison of Outputs (Original Plan vs. Actual)

Item	Original	Actual	Main Reasons for Changes
Baguio - Pangawan			
1. Road distance (km)	59.20	68.128	The halfway point was extended to the border between two provinces. Route changes took place as well.*2
2. Paving method: PCC*1 (km)	59.20	66	Since some paving took place after appraisal, this figure is lower than the actual road distance (68.128 km).
3. Slope protection	22,000 m or 66,000 m^2	117,129 m^2	Due to needs not recognized at the time of the appraisal
4. Flood countermeasures (m)	6,100	700	Embankment construction originally planned not needed due to the above route changes.
5. Bridges	2	2	No change
Pangawan - Aritao			
1. Road distance (km)	41.5	35.616	Due to the change in the halfway point mentioned under 1 above.
2. Paving method: PCC (km)	41.5	30	Due to paving by the DPWH conducted after the appraisal
3. Slope protection	15,000 m or 45,000 m^2	47,102 m^2	Due to discovery of unstable slopes
4. Flood countermeasures (m)	3,500	3,500	No change
5. Bridges	7	7	No change
6. Additions	N/A	Installation of road signage, landscaping, etc.	Installation was requested by Environment Compliance Certificate (revised in 2005).

Notes:
*1 PCC: Paving with Portland cement concrete
*2 Ambuklao Dam is located at the 35-km point on this section of road. The original route was changed because the National Power Corporation (NPC), which generates power at the dam, had requested suspension of construction because construction of a bypass through the vicinity would have a negative impact on the structure of the dam.

(2) Consultants

While consultants provided the originally planned services of detailed design, bidding support, and construction supervision, the following services were added to each of the services of consultants in response to changes in scope. Services related to environmental measures[5] were conducted as planned.

[5] This refers to conducting the supplementary Environment Impact Assessment, support for acquisition of land and resettlement conducted by the DPWH, and environmental monitoring to ensure compliance with the environmental conditions attached to the Environment Compliance Certificate.

Additional services:

- Detailed design: increase in detailed design services due to addition of RCBC[6] and design services related to the change of route of bypass roads
- Construction supervision services: addition of construction supervision in connection with extension of construction period

According to the executing agency, contractor performance (including quality of facilities) and quality of consulting services are evaluated highly.

3.2.2 Project Inputs

3.2.2.1 Project Cost

The project cost was planned originally at 4,317 million yen in foreign currency and 856 million pesos (2,568 million yen*) in local currency, for a total of 6,885 million yen.[7]

* Exchange rate: 1 peso = 3 yen

Actual project cost was 3,508 million yen in foreign currency and 1,265 million pesos (2,720 million yen*) in local currency, for a total of 6,228 million yen.[8]

* Exchange rate: 1 peso = 2.15 yen

Thus, the actual cost was lower than originally planned. (Actual vs. original: 90.5%, Sub-rating: ③)

A look at individual cost items shows that construction costs in Philippine pesos reached about 140% of the originally planned amount. This resulted from route changes on the bypass and an extension of the overall construction period. However, since the yen rose by about 40% in value against the peso over the project period, this increase was kept down when viewed in terms of yen.

Despite the increase in MM, costs of consulting services did not rise that much even when viewed in terms of pesos. This resulted from conclusion of contracts at amounts substantially lower than originally budgeted for consulting services paid in foreign currency, as the result of bidding.

3.2.2.2 Project Period

This project scheduled an implementation period of five years and two months, from the signing of the loan agreement (L/A) in September 1999 to completion of civil engineering work in October 2004. Actually, the L/A was signed in December 1999 and civil-engineering work was completed in March 2008. In other words, the project period planned for five years and two months in fact lasted eight years and four months, so that the ratio of the actual to the original project period rose to 161.3% (Sub-rating:①).

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[6] Reinforced Concrete Box Culvert, Drainage passing under road or railway, whose cross section is square.

[7] Of the total of 6,885 million yen, 5,852 million yen was planned to be funded by ODA loans, with the remaining 1,033 million yen to be funded from the Philippine government budget.

[8] Of the total of 6,228 million yen, 5,522 million yen was funded by ODA loans, with the remaining 706 million yen funded from the Philippine government budget.

The table below shows the main causes of delays.

Main Causes of Delays	Months Delayed
Section: Baguio - Pangawan	
• Delay in decision on construction contractors (final decision by contractor selection committee delayed due to lodging of complaint by a contractor that lost an order)	3
• Request made for suspension of construction in specific segment after detailed design (This refers to the request by the NPC for suspension of construction in the vicinity of Ambuklao Dam, mentioned above.)	6.9
• Negotiations with local residents to secure land for construction of Ambuklao Bypass	2.25
• Difficulty of construction due to structure involving narrow roads and major curves	2

Source: Prepared by the evaluator based on interviews with executing agency

Of the above main causes of delay, the "suspension of construction in specific segment after detailed design" can be considered a case in which prior explanation to and exchange of opinions with related parties possibly could have raised the problem in advance and reflected it in project plans. In addition, the "negotiations with local residents to secure land for construction of Ambuklao Bypass" is a secondary cause of delay resulting from the effects of the "suspension of construction in specific segment after detailed design."

3.2.2.3 Consulting Service

Additional consulting services stated in the above 3.2.1 Outputs resulted in an increase in MM in each of the three stages such as detailed design, before construction and construction supervision. Accordingly, MM of foreign experts, Pilipino experts and local supporting staff increased from the original plan respectively, from 163 to 217.4, from 429 to 559.72, and from 537 to 805.06.

For the above reasons, although the project cost was within the plan, the project period was significantly exceeded. Therefore the efficiency of the project is fair.

3.3 Effectiveness (Rating: ③)

3.3.1 Quantitative Effects

3.3.1.1 Results from Operation and Effect Indicators

The completion date was significantly delayed in the project. Considering the resulting time lag of the appearance of the project effect, we decided to compare the plan figure at 2004, which is 2 years later than the originally expected completion date, shown in the Feasibility Study report (F/S)[9] formulated in 2001, and the result in 2010, which is 2 years after the actual completion date. Then, the ratio of achievement of target indicator (traffic volume) is 84%, which is 1,413 to 1,682.

Forecast Annual Average Daily Traffic (AADT) on the Baguio - Aritao road shown in the feasibility-study (F/S) report and the results (actual) are shown below.

[9] In the F/S 1996 is the base year of simulation and 2002 is assumed as the year of project completion.

Table 2-1: Forecast and Actual AADT (the Baguio - Aritao road)

Unit: Number of vehicles

Year	1996 (actual)	2002	2004	2006	2011	2016
1. AADT (F/S forecasts)	N/A	1,400	1,682	2,020	2,782	3,812
3. AADT (actual)*	889	N/A	N/A	584	N/A	N/A

*Source: DPWH

Trends (details) in the road's actual AADT are shown below.

Table 2-2: Trend in Actual AADT (the Baguio - Aritao road)

Unit: Number of vehicles

Year	2001	2005	2006	2009	2010
Actual AADT	516	342	584	1,138*	1,413*
- Baguio - Pangawan				1,400	1,783
- Pangawan - Aritao				637	705

* Since AADT is recorded by segment for 2009 and later years, a weighted average taking into account the distance covered by each of the two segments is used.

Since no official statistics were available on matters such as shortening of time required for travel and savings in travel costs, the following supplemental qualitative effects are provided.

While a local police station (located near the starting point of the project road in Baguio) was visited to gather information related to traffic accidents on the project road, no official statistical figures was obtained. However, a police officer reported a feeling from police work that the number of traffic accidents had not increased. In a recipient survey of residents living near the road, largely the same numbers of responses reported increases and decreases. In conclusion, traffic accidents are not considered to be a serious problem. As the necessary guardrails were installed through the entire road section, it is estimated to contribute to the traffic safety.

3.3.1.2 Results of Calculations of Internal Rates of Return (IRR)

Economic Internal Rate of Return (EIRR)

Table 3: Comparison of Economic Internal Rate of Return (EIRR)

Before and After Project

	Appraisal	Ex-Post Evaluation (Recalculated)*
EIRR	15.6%	20.1%
Grounds for calculation:		
Project life	20 years	20 years
Cost	Project costs	Project costs
Benefits	Reduction in travel costs, savings in maintenance costs	Reduction in travel costs, savings in maintenance costs

* Since appraisal materials do not provide details on the EIRR calculation process, a standard calculating method for the road sector in the Philippines was employed.

It is very difficult to conduct the analysis of difference on the economic profitability, as the details

of the benefit calculation at appraisal were not available (It was assumed that recalculated EIRR may decrease, as the cost increased and also the traffic amount, which is the basis of calculation of benefit, decreased compared to the appraisal. It is estimated that the actual benefit may have increased somehow but the details are unknown[10]).

3.3.2 Qualitative Effects

During the Ex-Post Evaluation, we verified the effects reported in JICA documents as follows. As a result, the qualitative effects stated in the PCR were confirmed, using certain numerical figures and examples from interviews and other activities conducted in a field survey.

1. Reduction of travel time and stability in transport costs: Travel time over the approximately 100 km from Baguio to Aritao decreased from five hours prior to the project to three hours (according to the DPWH regional office). (Note: The project road is the one passing a very mountainous area and in the most of the sections one side of the road is a cliff. There are many curves and the shape is like Japan's famous "Nikko-Irohazaka". The quality of road was also very poor before the project.)

2. Alleviation of isolation of communities in each region[11] due to landslides during heavy rain or flooding: Prior to this project, landslides during heavy rains and flooding occurred three to four times a year, with each case rendering the road impassible for two to three days. Recently, the time of road closure has shortened to several hours (according to the DPWH regional office).

3. Improved market access for farmers: The volume of agricultural produce shipments has increased. Agricultural production takes place in Bokod and Kayapa, where vegetables such as lettuce, broccoli, and cauliflower are produced (according to the DPWH regional office).

4. Lessening of high vehicle maintenance costs and high transportation costs due to poor road conditions: Improved road quality has clearly reduced vehicle maintenance costs and high transportation cost (according to the DPWH regional office).

Next, results of a recipient survey (residents) conducted through random sampling in the vicinity of the project road are outlined below. A look at results of the recipient survey shows that the effect of travel time reduction is as good as other road projects in the Philippines (yen loan projects).[12] Access to various facilities has also improved.

No particular difference is apparent in the responses from recipient-survey subjects between the categories of ethnic minorities and others.

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[10] According to the ex-post economic evaluation conducted by DPWH (Economic Evaluation Update, in June 2006), the recalculated IRR of the project is 22.75%.

[11] Bokod, Benguet, Kayapa, Nueva Vizcaya, etc.

[12] According to comparison with the subject projects in ex-post evaluations in the road sector conducted in the Philippines last year

The total number of **resident respondents (not including ethnic minorities)** was 118 people, living beside or near the project road. Women numbered slightly more than one-half of respondents, and respondents' main occupations included no regular employment/homemakers, business people (e.g., store managers), manual laborers, professional drivers, and farmers. Nearly 80% of respondents (91 people) use the road daily.

Respondents gave the following responses on the direct benefits of this project:

- The project has resulted in an increase in volumes of materials shipped (primarily agricultural produce). (Given by 36 people, more than 30% of respondents)
- The project has realized a shortening of travel time. (Given by 81 people, nearly 70% of respondents, with more than one-half of respondents, 64 people, reporting that travel time that had been one hour before had decreased by 20 minutes or more.)
- The following percentages of respondents identified improvements in access:

Table 4-1: Situation of Improvement of Access (Residents not including ethnic minorities)

Destination	Percentage of Respondents Reporting Improvements in Access (%)
Markets, retailers	85.6
Social services (e.g., schools)	71.2
Hospitals	63.6
Government offices	35.6
NGO offices	6.8
Other	0.8

The total number of **resident respondents (ethnic minorities)** was 19 people, living beside or near the project road. Women numbered more than 70% of respondents, and respondents' main occupations included no regular employment/homemakers, farmers, business people (e.g., store managers), manual laborers, and professional drivers. More than 80% of the respondents (16 people) use the road daily.

Respondents gave the following responses on the direct benefits of this project:

- The project has resulted in an increase in volumes of materials shipped (primarily agricultural produce). (Given by six people, more than 30% of the respondents)
- The project has realized reduction of travel time. (Given by eight people, more than 40% of the respondents, with more than 30% of the respondents, six people, reporting that travel time that had been one hour before had decreased by 30 minutes or more.)
- The following percentages of respondents identified improvements in access:

Table 4-2: Situation of Improvement of Access (Ethnic minorities)

Destination	Percentage of Respondents Reporting Improvements in Access (%)
Markets, retailers	84.2
Social services (e.g., schools)	47.4
Hospitals	57.9
Government offices	26.3
NGO offices	21.1
Other	5.3

In light of the above, this project has largely achieved its expected effects, in areas such as steady growth in traffic on the project road, improvements in access to various facilities and shortening of travel time for local residents, and increased shipments of agricultural produce. Therefore its effectiveness is high.

3.4 Impact

3.4.1 Intended Impacts

(1) Assessment Using Quantitative Indicators

The status of indicators of impact is shown in Table 5 below. While the appraisal record indicated that the project's objectives were to promote and vitalize the economy in the Cordillera region and to improve the welfare of its residents, since the project road passes through only a small part of the Cordillera region, the direct impact of the project was measured by narrowing the scope of the indicators. Economic indicators for Benguet Province, which includes the project road, and the cities through which the road passes are, overall, in a continuously upward trend.

While it is difficult to prove a clear cause-effect relationship, among these indicators it is fair to say that behind increases in vegetable production and in numbers of tourists are greater ease of transporting agricultural produce due to improvements to the project road and greater ease and speed of travel due to same improvements in road conditions. Statements from interviews conducted with related parties in this survey also support this conjecture.

Table 5: Economic Indicators in the Vicinity of the Project Road

Note: The entire project road was completed in March, 2008.
(the Pangawan - Aritao segment was completed in December 2006.)

Indicator	2005	2006	2007	2008	2009	2010
1. Vegetable production (metric tons, or M.T.)						
- Bokod *[1]	524.30	565.00	583.00	570.50	625.50	888.33
- Itogon	245.50	242.50	278.50	294.50	331.50	321.00
2. Number of visiting tourists						
- Benguet Province	84,192	106,382	117,365	194,491	205,032	228,312
- Baguio City	637,298	709,671	794,548	814,975	770,187	N/A

Sources: Department of Trade & Industry Baguio office, Cordillera Administrative Region Department of Agriculture, Cordillera Administrative Region Department of Tourism

*1 The majority of the Baguio - Pangawan section of the road covered in this project (68 km) is in the two cities of Bokod and Itogon.

*2 Baguio is the capital of Benguet Province, where the project road is located, and is the starting point of the road.

The main industry in both Benguet and Nueva Vizcaya provinces, where the project road is located, is agriculture. This survey examined, in particular, production of vegetables, main products in both cities of Bokod and Itogon, located in Benguet Province. As shown in the table above, production increased steadily in the period following completion of the road. According to an interview with the Cordillera Administrative Region Department of Agriculture, there are agricultural trade centers in La Trinidad (near Baguio, the starting point of the road) and Banban (near Aritao, the end point of the road). Farmers producing agricultural produce along the road transport about 90% of their harvests to these trade centers where they are bought by brokers. For this reason, it is conceivable that these farmers benefit from improvements to the project road.[13]

Figures of Benguet Province on numbers of visiting tourists seem to show an increase that began around the time the project road was completed. According to the DPWH regional office, in recent years numbers of travelers are increasing in both directions on this road. While this is not statistical data, it is said that there is a sense that numbers of travelers, including those from overseas, clearly have been increasing in recent years. According to an interview with the Cordillera Administrative Region Department of Tourism, there are five main routes by which tourists come to Baguio[14], and this road is ranked third among these in terms of traffic volume. The interviewed staff guessed that while the share of this road had been 5% or less prior to this project, it probably had reached a level of 10% following the project.

(2) Qualitative Impact Analysis

Results of a recipient survey (residents) conducted in the vicinity of the project road concerning the project's impact are outlined below.

A considerable number of respondents to the questionnaire (residents) responded that they had gained new employment opportunities and that their income had increased. As such, the project can be surmised to have had some economic impacts. However, it is conceivable that the respondents enjoyed these economic impacts because they resided along the road.

Largely equal numbers of respondents reported increases and decreases in traffic accidents, so that at the very least there appears to be no increasing trend in accidents. Many respondents were of the opinion that the environment (such as air) had improved.

Responses to the questionnaire in general show no major differences between residents belonging to ethnic minorities and other residents.

[13] In an interview at the agricultural trade center in La Trinidad, a woman vegetable (cauliflower) grower who came from the town of Kabayan at the north of the project road reported that, while previously it had taken her 6 - 7 hours to go from Kabayan to Baguio, it now took 4 - 5 hours. Furthermore, she said that the volume of produce she shipped had increased and her income had risen as well. Diversification of production in accordance with advice from the Department of Agriculture and changes in production to match consumer tastes seem to be behind this increase in farmers' production as well.

[14] Baguio is a popular summer resort, as widely known as "Summer capital". Many tourists visit Baguio every year.

Resident respondents (not including ethnic minorities; the same 118 people described above) gave the following specific answers concerning the impact of this project:

1. Employment opportunities: Have new employment opportunities become available since this project?: 27.1% Yes; 66.1% No; 6.8% no answer
2. Changes in income: Has household income increased since this project?:[15] 47.5% Yes; 40.7% No; 11.9% no answer
3. Changes in number of traffic accidents: 37.3% increased; 37.3% decreased; 25.4% not sure
4. Effects of the project on property and houses: No respondents sold land for use in this project.
5. Environmental changes since the project (only main items excerpted below, with percentages of respondents):

Item	Worsened	No change	Improved
Air	0.0	51.7	48.3
Noise	1.7	44.1	54.2
Water quality	0.0	85.6	14.4

6. Overall evaluation of project benefits:

Item	Percentage of Respondents (%)
Excellent	22.0
Good	49.2
Neutral	23.7
Slightly Negative	0.0
Very Negative	0.0
No answer	5.1

Resident respondents (ethnic minorities; the same 19 people described above) gave the following specific answers concerning the impact of this project:

1. Employment opportunities: Have new employment opportunities become available since this project?: 26.3% Yes; 73.7% No; 0.0% no answer
2. Changes in income: Has household income increased since this project?: 36.8% Yes; 36.8% No; 26.3% no answer
3. Changes in number of traffic accidents: 36.8% increased; 26.3% decreased; 36.8% not sure
4. Effects of the project on property and houses: No respondents sold land for use in this project.
5. Environmental changes since the project (only main items excerpted below, with percentages of respondents):

[15] It is estimated since the respondents also included many people operating stores along the road, the increase in traffic led to an increase in income.

Item	Worsened	No change	Improved
Air	0.0	57.9	42.1
Noise	0.0	52.6	47.4
Water quality	0.0	89.5	10.5

6. Overall evaluation of project benefits:

Item	Percentage of Respondents (%)
Excellent	26.3
Good	36.8
Neutral	26.3
Slightly Negative	0.0
Very Negative	0.0
No answer	10.5

Other results of interviews concerning the project's impact are summarized below:

- Two drivers for one bus company operating regularly on the project road estimated that the company's net income may have increased by about 10% due to the effects of shortened travel time.
- One private-sector firm operating a rice-cleaning mill near the project road reported that the effects of shortened travel time resulting from this project had led to benefits including the ability to ship greater volumes of cargo and a lessening of the impact of typhoons. It estimated that these may have resulted in an increase of roughly 30% in the company's net income.
- Seven barangay captains (the equivalent of town or village mayors) of communities near the project road reported that residents enjoyed the benefits of shortened travel time, with six grading the project "Excellent" on a five-grade scale and one grading it "good." However, there were some calls for installation of streetlamps and paving of the road's shoulder.

3.4.2 Other Impacts

(1) Impacts on the Natural Environment

In 2002 the Department of Environment and Natural Resources (DENR) issued an Environment Compliance Certificate (ECC)[16] indicating that the Environment Impact Assessment (EIA) was properly conducted prior to the project. The ECC contains activities necessary to protect the environment during the project implementation and are reflected in the Terms of Reference (TORs) for construction contractors as well. During actual construction, a Multiparty Monitoring Team[17] met monthly to monitor the environmental impact of construction based on ECC and confirmed there was no particular problem.

When the executing agency was interviewed, using the standard environmental checklist used in past appraisal of yen loan projects, generally positive conditions were confirmed regarding the natural

[16] This ECC is an additional ECC based on supplementary EIA at the time of D/D.
[17] Local offices of the DENR, the regional office of the DPWH, local governments, and others participated.

environment in aspects such as air, water quality, noise, vibration, and soil pollution. As seen in the results of the recipient survey, community residents also generally judged the environment have improved after this project in areas such as air, noise, and water quality.

However, there have been sporadic cases of earth and sand to flow downstream caused by rainfall, requiring responses on an individual basis.

(2) Land Acquisition and Resettlement

No residents were resettled in connection with this project, as this project was to improve the already existing road. However, although no necessity of land acquisition had been confirmed at the detailed design stage, in the end a certain number of parcels of privately held land needed to be acquired in order to secure a road width 15 meters from the center line in low-lying land at Aritao. According to the executing agency (regional and district DPWH offices), land was acquired from 34 local residents. While the related procedures took some time to complete, the acquisition of land appears to have come to a peaceful resolution[18].

To summarize the above points, this project has realized the originally anticipated impact to some degree, for example by increasing shipments of agricultural produce from farmers in the vicinity of the road and increasing numbers of tourists.

3.5 Sustainability (Rating: ②)

3.5.1 Structural Aspects of Operation and Maintenance

The maintenance structure of the project road is stable, unchanged from expectations as of the time of the appraisal and from the time of PCR preparation. The chain of command is defined clearly at each office in the area and staffing is stable. However, as outlined below, the scale of staffing for the project road cannot be said to be adequate.

As originally planned, the DPWH regional office is responsible for maintenance following completion of the project, and actual maintenance work is conducted by district offices under the supervision of the regional office.

Specifically, the following three district offices carry out maintenance of the project road:

- Benguet 1st District Engineering Office
- Nueva Vizcaya 2nd District Engineering Office
- Baguio City District Engineering Office

When the two offices in Benguet and Nueva Vizcaya, which are responsible for the most of the project road, were interviewed, they reported that the chains of command, led by highly experienced engineers, were clearly defined and staffing was stable. However, they also reported that current staffing was inadequate, when taking into consideration the conditions of the area, where landslides occur frequently. It was reported in the interview in Benguet that while budget allocation was

[18] Confirmed by PCR and individual interviews. Details of compensation amount at land acquisition were not available.

conducted uniformly on a nationwide basis in accordance with government rules calling for assignment of personnel at a rate of one worker per 3.5 km, there would be a need to assign workers at a rate of one person per 2 km to maintain roads in this area, where landslides are highly frequent. It also was reported that while the office currently had 24 workers, it needed 12 more.

At the Nueva Vizcaya office as well, the view was expressed that while the office currently had 10 workers, it needed at least 20 more.

It was reported (by both offices) that since there was an actual shortage of personnel, tasks such as cleaning of gutters, cutting overgrown trees, and improving unpaved shoulders were not being conducted adequately.

The evaluator also confirmed that in a number of locations the road's gutters were buried in earth and sand. It affects road quality in the long run and some corrective measures need to be implemented.

3.5.2 Technical Aspects of Operation and Maintenance

While there are no particular technical problems, the shortage of personnel mentioned above and shortages of materials and equipment are factors limiting the implementation of full maintenance activities.

Maintenance is conducted based on the Philippine Highway Maintenance Management System, the standard manual of the DPWH. At the Benguet 1st District Engineering Office, it also was reported that engineers, staff, and workers were provided with periodic training.

Main maintenance activities are listed below.

Daily maintenance, conducted at both offices:

- Cleaning gutters
- Cutting trees
- Repairing cracks
- Repairing road painting

Special maintenance, conducted at the Benguet 1st District Engineering Office:[19]

- Maintenance of road conditions in the event of landslides

At the Benguet 1st District Engineering Office, a shortage of vehicles such as bulldozers was identified as a technical problem. It was reported that particularly in the event of a large-scale landslide the vehicles, machinery, and equipment on hand were insufficient for responding, and as such the office was forced to ask to rent vehicles from private-sector contractors. This is one leading factor putting pressure on the office's finances.

[19] At the Nueva Vizcaya 2nd District Engineering Office, the comment was heard that, other than daily maintenance, preventive maintenance was not being conducted because of budget shortfalls. It would appear that the situation probably is the same at the Benguet 1st District Engineering Office as well.

3.5.3 Financial Aspects of Operation and Maintenance

While a certain degree of budgeting has been secured, basically both offices clearly feel a shortage of workers in comparison to the ideal conditions and also lack funding for rental of vehicles, machinery, and equipment to respond to large-scale landslides. Taking into consideration the conditions in both offices, it would be desirable to increase the amounts of both personnel and budget.

The conditions of budgeted and actual costs at both offices over the past three years are shown below.

Table 6-1: Maintenance Budget and Results (Benguet)

Unit: Philippine pesos

FY	Original Budget	Results
2008	2,503,055	2,658,696
2009	3,251,060	3,878,040
2010	2,154,209	2,474,659

Table 6-2: Maintenance Budget and Results (Nueva Vizcaya)

Unit: EMK*

FY	Original Budget	Results
2008	34,515	34,515
2009	13,475	13,475
2010	33,990	33,990

*Maintenance costs of national highways and bridges in the Philippines are calculated as follows based on the EMK system:
Maintenance cost = Basic Cost multiplied by EMK
Basic Cost: The cost required to maintain a single kilometer of road for one year, decided by the Bureau of Maintenance each year taking into consideration the rate of inflation in cost accounts
EMK: An index determined based on pavement type, road width, and traffic volume

In this way, both offices have been authorized expenditures of a scale roughly equal to or above the amounts budgeted originally. However, basically both offices feel strongly that they are short of personnel and budget in comparison to the ideal, and neither can be said to be in a good budgetary state.

For reference, the table below shows trends in annual road maintenance budgets in recent years for the entire DPWH, which apportions maintenance budget for this project[20]. While a certain amount of maintenance budget is secured each year, it showed somewhat a decreasing trend until 2010.

Table 7: Trends in DPWH Road Maintenance Budgets

Unit: million pesos

FY	Regular Road Maintenance	Regular Shoulder Maintenance	Preventive Maintenance	Total Length of National Highways (km)
2008*1	4,021	1,850	6,690	30,224
2009	3,500	2,020	7,300	30,594
2010*2	2,000	2,020	2,960	29,579

Source: DPWH Bureau of Maintenance
*1 In 2008, approximately 663 million pesos were secured as road safety costs not included in the table above.
*2 In 2010, approximately 200 million pesos were secured as road safety costs not included in the table above.

[20] Major sources of DPWH's budget of operation and maintenance of roads are GAA (General Approved Allocations) and MVUC (Motor Vehicle User's Charge).

3.5.4 Current Status of Operation and Maintenance

Visual inspection by the evaluator confirmed that the road appeared to be in very good condition, with almost no visible holes or cracks. Guardrails too are installed in each location where there is a precipice on one side of the road. However, here and there the gutters were covered in earth and sand. Since clogged gutters will cause earth and sand to come into contact with the road directly, damaging the road surface, the gutters need to be cleaned. At a point 20 km from Baguio, a large-scale landslide had occurred (more than 10 meters long both vertically and horizontally), although it was not a location subject to reinforcement works in this project[21], and the ground surface of the roadside was exposed clearly. While the earth, sand, and other debris already had been cleaned up, the guardrails appeared to have been destroyed, so that there were no guardrails at all in the portion of road affected by the landslide. These need to be repaired completely.

A look at the results of the recipient survey shows that residents in the vicinity of the project road are satisfied with the state of the road's maintenance. Specifically, of the 118 local residents surveyed the vast majority of 112 reported being satisfied with the state of road maintenance.

At present, no cases have been confirmed of damage to the road resulting from overloading as a result of improvements to road conditions through this project.

In summary, while road conditions, which are an assumption of sustainability evaluation, are not flawless, they have been evaluated as good. Next, evaluation was conducted of each of the aspects of organizations and structures, technology, and finances, using a three-grade (high, fair, low) scale, and each of these aspects was judged to be fair.[22]

For the above reasons, some minor problems have been observed in terms of structures, technology, and financial conditions, and therefore the sustainability of the project effect is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The objective of this project is to promote transportation for people and materials and improve the efficiency and reduce the costs of shipping by improving main roads in the Cordillera region in the mountainous area of north-central Luzon. Since the project suits the Philippines' development policies and development needs and is in agreement with the aid policies of the Japanese government, the relevance is high. It also is highly effective since the volume of transportation on project roads has increased steadily, local residents' access to various facilities has improved, and travel time has decreased. Furthermore, the project also is having a gradual impact on the local economy, for example by increasing volumes of agricultural produce shipped by farmers in the vicinity of the project road and increasing numbers of tourists.

However, the project's efficiency is assessed to be fair, as the project period was significantly longer than originally planned. There also are issues that should be improved in the areas of road conditions and maintenance, so that the sustainability of the project's effects is fair.

[21] The landslide appears to have been caused by rainfall.
[22] In this project's case, organization and structure, technology, and finance problems are interrelated.

In light of the above, this project is evaluated to be satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

(1) Since a large-scale landslide has occurred on part of the project road (at a point roughly 20 km from Baguio) and, while the earth and sand has been cleaned up, repairs are not complete, the guardrails need to be repaired. Since on the road as a whole there are spots here and there in which the gutters are covered in earth and sand, it would be desirable to clean the gutters thoroughly in order to maintain good road conditions.

(2) The maintenance budget and numbers of personnel at the district offices of the DPWH responsible for the road cannot be said to be adequate for purposes of appropriate maintenance, at least as far as the interviews are concerned. In consideration of the nature of this locale as a place with steep terrain susceptible to landslides caused by rainfall, it would be desirable to increase the maintenance budget.

4.2.2 Recommendations to JICA

No particular recommendations

4.3 Lessons Learned

In the process of interviews conducted in this survey, it was confirmed that budget allocation was conducted uniformly on a nationwide basis in accordance with government rules calling for assignment of personnel at a rate of one worker per a certain length. Since road conditions and terrain vary by locale, it would be desirable to apply a more flexible rule in accordance with local conditions, allowing more staff allocated in the mountainous area or the area with frequent landslide.

Comparison of the Original and Actual Scope of the Project

Item	Original	Actual
1. Project Outputs		
Baguio - Pangawan		
1) Road distance (km)	59.20	68.128
2) Pavement method: PCC (km)	59.20	66
3) Shoulder improvements (gravel, km)	118.40	121.50
4) Spillways		
- Gutters (km)	20.00	59.18
- RCPC (m)*1	3,300	2,203
- RCBC (m)*2	300	948.50
5) Structures (n.l. [m])		
- Construction	2	As planned
- Repairs (existing bridges)	120	As planned
6) Slope protection	22,000 m or 66,000 m^2	117,129 m^2
7) Flooding countermeasures (m)	6,100	700
8) Bridges	2	As planned
Pangawan - Aritao		
1) Road distance (km)	41.5	35.616
2) Pavement method: PCC (km)	41.5	30
3) Shoulder improvements		
- Gravel (km)	76.00	As planned
- AC/PCC (km)	7.00	3.50
4) Spillways		
- Gutters (km)	20.00	19.60
- RCPC (m)	2,000	850
- RCBC (m)	200	72
5) Slope protection	15,000 m or 45,000 m^2	47,102 m^2
6) Flooding countermeasures (m)	3,500	As planned
7) Bridges	7	As planned
8) Additional items	N/A	Installation of road signage, landscaping, etc.
2.Project Period	September 1999 - October 2004 (62 months)	December 1999 - March 2008 (100 months)
3.Project Cost Amount paid in Foreign currency Amount paid in Local currency Total Japanese ODA loan portion Exchange rate	 4,317 million yen 2,568 million yen (Local currency: 856 million pesos) 6,885 million yen 5,852 million yen 1 Peso = 3 yen (as of January 1999)	 3,508 million yen 2,720 million yen (Local currency: 1,265 million pesos) 6,228 million yen 5,522 million yen 1 Peso = 2.15 yen (weighted average for years 2001 - 2008)

*1. Reinforced Concrete Pipe Culvert, Drainage passing under road or railway, whose cross section is circle.

*2. Reinforced Concrete Box Culvert, Drainage passing under road or railway, whose cross section is square.

The Republic of the Philippines

Ex-post Evaluation of Japanese ODA Loan
Agrarian Reform Infrastructure Support Project Phase II

External Evaluator: Kinuko Mitani, IC Net Limited

0. Summary

The project objective is to increase agricultural productivity and household income of agrarian reform beneficiaries in 150 Agrarian Reform Communities (ARC) by providing small-scale irrigation and drainage facilities, post-harvest facilities, farm-to-market roads, potable water supply systems, organization and capacity development of farmers groups, and capacity development of local government units in the project areas, thereby contributing to improvement of living conditions of farmers in the project areas. The project has been highly relevant to the Philippines's development plan and development needs. Similarly, the project is in line with Japan's Official Development Assistance (ODA) policy for the Philippines; therefore, its relevance is high. Some changes were made to the project scope based on the needs of the local communities in the project areas. The revised scope facilitated the achievement of the project purpose. Although the project cost was within the plan, the project period was exceeded; therefore, the project efficiency is fair. The project's effectiveness is high, since it has largely achieved its objectives. For example, the irrigable areas increased owing to development of small-scale irrigation and drainage facilities in the project areas. In addition, most of the basic and essential infrastructure was developed in the project areas as planned. The construction of these facilities improved access to transportation and potable water in the project areas; thereby livelihoods of farmers in the project areas are improving. Thus, the impact of the project is high. Some uncertain factors were observed in terms of technical and financial aspects of the operation and maintenance of the project; therefore, sustainability of the project effect is fair. In light of the above, the project is evaluated to be satisfactory.

1. Project Description

Project locations – 150 ARCs in the Philippines


Intake weir constructed in the project


Line canal developed in the project

1.1 Background

The Government of the Philippines (GoP) put the Comprehensive Agrarian Reform Program (CARP[1]), which aimed at increasing income for landless farmers, into operation in 1988, and instituted 8.06 million hectares for distribution. Accordingly, 1.70 million hectares were distributed under the Aquino administration, and 2.90 million hectares under the Ramos and Estrada administrations. Under the new law, RA 9700, which came into effect in 2009, otherwise known as Comprehensive Agrarian Reform Program Extension with Reforms (CARPER), land distribution is expected to be completed by 2014. However, CARP had limited assistance to infrastructure or institutionalization or financing, or technical services to farmers who obtained land. Hence, not only increases in agricultural productivity but also improvement of livelihoods were still major problems. In response to these problems, the GoP developed a plan of infrastructure and institutional development to farmers with distributed land, and appointed the Department of Agrarian Reform (DAR) as the executive agency.

DAR identified over 900 Agrarian Reform Communities (ARC[2]) throughout the Philippines, and set an ARC as basic unit of development. DAR has provided comprehensive assistance to these ARCs, including the development of essential infrastructure that is necessary to improve agricultural productivity, formation of farmers groups, financing, and other support services. The Japan International Cooperation Agency (JICA) has supported agrarian reform by implementing Agrarian Reform Infrastructure Support Project (ARISP[3]) and Rural Farmers Agrarian Reform Support Credit Program as part of the 23rd ODA loan for the Philippines. Phase II was formulated upon the completion of Phase I (78 ARCs were targeted for development of essential infrastructure and organizations). Lessons learned from Phase I were incorporated into this project, which aimed to construct basic and critical infrastructure, increase/build capacity of concerned local government units (LGUs) and farmers' groups, and contribute to the improvement of living conditions in the project areas. Phase II includes ARCs with indigenous people in the covered area(s).

1.2 Project Outline

The project aims to increase agricultural productivity by developing essential infrastructure facilities, organizing/strengthening farmers groups, and developing the capacity of LGUs in 150 ARCs nationwide to which farm lands were distributed to farmers as per CARP, thereby contributing to improvement of livelihoods of farmers in the project areas.

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[1] The CARP is a 10-year program, and came into effect in 1988. Under the Ramos Administration, the implementation period was extended by another 10 years, which made 2008 as the completion year. On the other hand, the Philippines Medium-Term Development Plan (1999-2004) stated that the CARP would be completed in 2004. Despite the changes in the completion year of the CARP, the GoP has given high importance to the CARP.

[2] ARC is a barangay or a cluster of barangays (local term for a smallest administrative unit in the Philippines) in which a critical mass of the population consists of agrarian reform beneficiaries (each ARC member holds 2 hectares of land on average), and is not an administrative unit.

[3] In this report, ARISP is referred as Phase I, this project as Phase II, and the project currently being implemented as Phase III.

Loan Approved Amount/ Disbursed Amount	16,990 Million yen/ 12,333 Million yen
Exchange of Notes Date/ Loan Agreement Signing Date	December 1999/ December 1999
Terms and Conditions	Interest Rate: Civil Works1-1.8%, Civil Works 2-1.3%, Consultancy services-0.75% Repayment Period: 30 years (Consultancy services 40 years)(Grace period: 10 years） Multiple conditions
Final Disbursement Date	March 2007
Borrower/ Executing Agency	The Government of the Republic of the Philippines/ Department of Agrarian Reform
Main Contractor	None
Main Consultant	Nippon Koei, Co., Ltd. (Japan)/ PKII Engineers (Philippines)/ Hydroterre Consultants, Inc.（Philippines）
Feasibility Study, etc.	None
Related Projects	<Yen loan projects> Agrarian Reform Infrastructure Support Project (I), (III)

2. Outline of the Evaluation Study

2.1 External Evaluator

Kinuko Mitani, IC Net Limited

2.2 Duration of Evaluation Study

Duration of the study: January - December 2011

Duration of the field study: March 24 - April 20, June 13 - July 12, September 25 - October 4, 2011

2.3 Constraints during the Evaluation Study (if any)

The project provided assistance in basic infrastructure development and institutional development to 150 ARCs throughout the Philippines. Due to the limited study period and budget, only two locations each from 3 island groups namely Luzon Island, Visayas, and Mindanao Island[4] were

[4] When selecting survey sites at the time of post-evaluation, geographic balance was taken into consideration. According to the selected 3 areas namely Luzon Island located in north, Visayas located in center, and Mindanao Island located in south was taken into consideration, 2 locations per area were selected. Additional selection criteria were set such as location, LGU and ARC were thought. The criteria was 1) ethnic balance, 2) accessibility from Manila, 3) component covered (i.e., infrastructure development, institutional development, etc), and 4) security conditions. The areas selected for the ex-post evaluation of ARISP as well as JICA impact evaluation (La Union, Iloilo, and Compostela Valley) were excluded from for the ex-post evaluation.

selected for site visits and beneficiary surveys. No site visit was conducted for the remaining 144 ARCs except for simplified beneficiary surveys utilizing the network of the executing agency on the ground. During the ex-post evaluation, the availability of key data for the project was severely limited.

Hence, the qualitative data collected through the interviews with beneficiaries, the executing agency, and the cooperating agencies were highly valued.

3. Results of the Evaluation (Overall Rating: B[5])

3.1 Relevance (Rating: ③[6])

3.1.1 Relevance with the Development Plan of the Philippines

The 1987 Constitution of the Philippines propelled land distribution to Agrarian Reform Beneficiaries (ARBs), which are landless farmers in rural areas. The land distribution was realized via CARP, and the objective of such distribution was to increase income of these farmers. During the project appraisal, the Medium-Term Philippine Development Plan (1993-1998) put high priority on CARP. Thus, the DAR's development plan (1994-2004), 6,881 million peso was budgeted to implement ARISP Phase II. When Arroyo administration was established in 2004, creating employment and providing social justice and basic needs were highlighted as pressing issues. Accordingly, agriculture and agribusiness development was planned and implemented through CARP including the promotion of agricultural industrialization and employment creation in ARCs.

During the ex-post evaluation, Medium-Term Philippine Development Plan (2011-2016) explained that assistance to agriculture and rural development was one of the priority agenda. The priorities were given to securing 150 billion yen to complete CARP by 2014, establishing competitive, sustainable and technology-based agriculture and fisheries sector, and transforming farmers who obtained farm land into viable entrepreneurs. The GoP is currently implementing ARISP Phase III with JICA's assistance.

Development policy in the Medium-Term Philippine Development Plan addressed a pressing need to assist in basic and essential infrastructure development. Change of central administration did not influence, and the present administration continues to implement agrarian reform, to develop basic and essential infrastructure for farmers, and to assist in capacity development of farmers groups.

3.1.2 Relevance with the Development Needs of the Philippines

When the project was formulated, DAR aimed to complete CARP in 2008. The main activities are implementation of Land Tenure Improvement (LTI) component and support services delivery including development projects targeting ARCs. For example, Phase I provided assistance for the development of basic and essential infrastructure and the organization of farmers.

A request for assistance was made by LGUs and farmers who were not covered in Phase I to extend the similar assistance to other sites. In particular, the need for basic and essential infrastructure development was highly expressed. Likewise, the need to include areas with high concentration of

[5] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory
[6] ③: High, ②: Fair, ①: Low

indigenous groups also came about. Based on lessons learned and recommendations from Phase I, the GoP proposed to undertake Phase II and provide assistance to farmers who were the new recipients of land in rural areas.

According to Japan's Ministry of Foreign Affairs, at the time of project appraisal (1997), the poverty rate in the Philippines was approximately 40%. In the Medium-Term Philippine Development Plan (1993-1998), it was stated that the poverty rate would be reduced to 30%. However, the poverty rate was 34% in 2000. The expected poverty rate was not achieved as it fell by 4%. According to the National Statistics Office Report (Philippines, 2011), the poverty rate was 26.5% in 2009. This indicates that there was poverty reduction of 13.5% when compared with poverty rate from the time of appraisal. The GoP aims to the further reduce the poverty rate.

According to data from the National Statistics Office (2007), one out of five households has no access to potable water supply systems. Situations like this affirm that the development of basic and essential infrastructure and the reduction of poverty rate are important goals for the GoP. The GoP suggested that assistance to infrastructure development in rural areas was an issue in the Medium-Term Philippine Development Plan (2011-2016). Hence, the development needs for this project during the ex-post evaluation remain severe.

3.1.3 Relevance with Japan's ODA Policy

The Country Assistance Program for the Philippines (2000) stated the following: 1) securing sustained economic growth, 2) alleviating poverty, 3) protecting environment, 4) developing human resources, and 5) strengthening governance as the priority areas. Similarly, the Program highlighted the importance of agricultural and rural development, which contributes to poverty alleviation. In 1999, Japan Bank of International Cooperation stated in the Medium-Term Strategy for Overseas Economic Cooperation Operations that priorities were given to strengthening economy and overcoming constraints toward sustained economic growth, poverty alleviation and regional disparity reduction, aid contributing to environment protection, aid in development of human resources and systems. As a way to poverty reduction, the development of economic and social infrastructure and capacity are also given high importance. Hence, the project is aligned with the development plan and strategy highlighted above.

For the above reasons, the project has been highly relevant to the Philippines's development plan and development needs that focus on basic and essential infrastructure and institutional development, as well as Japan's ODA policy. Therefore, its relevance is high.

3.2 Efficiency (Rating: ②)

3.2.1 Project Outputs

The project was composed of: 1) civil works, 2) institutional development, 3) procurement of equipment, and 4) consulting services. To implement the project, DAR was the executing agency. The National Irrigation Administration (NIA) and the Department of Public Works and Highways (DPWH) were the cooperating agencies and were responsible for civil works. NIA constructed small-scale

irrigation and drainage facilities and post-harvest facilities[7], while DPWH developed farm-to-market roads and bridges. The LGUs (municipality level) in the project sites installed potable water supply systems. DAR planned and implemented, in partnership with local NGOs, training courses whose objectives were institutional development and strengthening of farmers groups such as irrigators' associations (IAs[8]), cooperatives[9] and water user's associations (WUAs[10]). At the time of the project implementation, DAR imparted various strategies to assure effective coordination and collaboration among all concerned agencies.

Civil works, procurement of equipment, institutional development and strengthening, and consulting services were covered by the Japanese ODA. The following are the actual outputs per component.

(1) Civil Works

Each ARC prepared a development plan before the project started. Activities such as civil works and institutional development were to be implemented according to the approved development plan. However, the plan was revised in 2004 (the reason for the revision is discussed in the following). Hence, when the actual accomplishment was compared with the revised plan, the achievement level of irrigation and drainage facilities was 99%, farm-to-market roads was 100%, and post-harvest facilities was 103%. The actual achievement of the potable water supply system was 102% of the revised plan (see Table 1).

Table 1: Civil Works – Plan and Actual

Item	Irrigation and drainage facility (ha.)	Farm-to-market road (km)	Post-harvest facility (unit)	Potable water supply system (unit)
Original plan	43,433	766	122	66
Revised plan (2004)	31,707	646	66	80
Actual (2007)	31,595	646	68	82
Ratio against the revised plan (%)	99	100	103	102

Source: Executing agency

Each of the 150 ARCs has a development plan, which was prepared at field level jointly among the executive agency, cooperating agencies and community members before civil works started. Changes in the original development plans have to be made to suit to the local needs of the ARBs from the time of appraisal to the time the project started. As a result, the time for review and approval of such plans took longer than expected. This became the main factor for reduction of scope of civil works, although

[7] Farmers in the Philippines typically dry paddy using road side. When paddy is dried on a road, there are impurities in paddy. As a result, selling price for the paddy is reduced. Hence, the needs for solar dryer and storage are very high.
[8] IAs are formed by local farmers. Their main task is to operate and maintain the irrigation facilities developed in the project.
[9] Cooperatives are formed by local farmers. The main responsibilities include dissemination of operation and maintenance of the post-harvest facilities, assistance in the farming technology to its members including credit lending, buying and selling of paddy and farm inputs.
[10] WUAs are formed by local community members who reside nearby the potable water supply systems developed in the project. Their main task is to maintain the systems and collect user's fee.

scope of potable water supply system was increased. These changes of scope reflecting the local needs were relevant from view point of the project objective. Reasons for the revision were as follows.

- Target ARC: there was no change in the number of target ARCs. 51 ARCs from the original 150 ARCs were replaced when the project started.
- Irrigation and drainage facility: As a result of preparation of detailed plan jointly with local community members, areas which required new facilities were reduced[11].
- Farm-to-market road: some roads were already developed by LGUs in the project areas. Thus, the number of the target road development was reduced.
- Post-harvest facility: Cooperatives are responsible for O&M of post-harvest facilities. As a result of the assessment of Cooperatives' organizational maturity level and capacity to manage the facility in a sustainable manner, less number of Cooperatives could meet the minimum required level of capacity and lot where the structure would be put up.
- Potable water supply system: community needs in the project areas were re-assessed in participatory manner involving local communities/direct beneficiaries themselves. As a result, needs for new potable water supply system installation was higher than the plan. Hence, the scope was revised in order to cover additional requirements based on the local needs.

(2) Institutional Development

In the institutional development component, training on capacity development and enhancement was planned and implemented focusing on organization of beneficiary groups as well as three farmers groups (IAs, cooperatives, and WUAs) organized in the project. The number of farmers who attended the training was 46,796 by the project completion. There were training courses completed in one day, and other courses were scheduled for more than one day according to the nature of training courses.

DAR signed a contract with the Development Academy of the Philippines (DAP), which is government owned and controlled organization for implementation of the institutional development component. DAP mobilized local NGOs, which were equipped with local knowledge and experience in capacity development and enhancement of the capacities of farmers groups, planned and conducted training courses based on the needs of farmers. According to the interview with DAR and beneficiaries of the project, the NGOs, which were responsible for capacity development and enhancement training, were highly appreciated.

The capacity development of LGUs in the project areas focused mainly on technical advisory related to techniques and knowledge on civil works. NIA and DPWH were responsible for the capacity development from a technical viewpoint. Technical guidance on development of plan formulation and project management (i.e., construction supervision, financial management) were provided by experts assigned to the project. DAR conducted training related to agriculture technology. According to

[11] When each ARC conducted needs assessment jointly with DAR, NIA and local community members in the project areas, problems to secure adequate water resource arose in some areas. Hence, it was determined that construction of new irrigation system was not relevant in those areas. Similarly, land development was necessary before construction of new irrigation system. The required land development was very costly: Hence it was concluded that the project could not cover such high cost.

interviews with LGU officials who participated in the training, the training was very satisfactory because participants were able to acquire knowledge pertaining to new technologies and confirms the approriateness of technologies already applied on the ground.

The actual accomplishments based on the plans are shown in Table 2. The number of ARCs selected for the project did not change except for the replacement of certain ARCs from the original number as planned. Based on ARC replacement, the number of target LGUs increased in 2004. The accomplishment level for institution development by the LGUs was slightly higher than planned.

Table 2: Institutional Development – Plan and Actual

Target	ARC	LGUs
Original plan	150	66
Revised plan (2004)	150	80
Actual (2007)	150	82
Accomplishment level (%)	100	102

Source: Executing agency

(3) Procurement of Equipment

Based on the needs of DAR at central and local levels, the procurement of 80 four-wheel vehicles and 80 computers[12] was planned. By the end of the project implementation, not only the number of equipment procured was increased, but also the items to be procured were added. The items added were two-wheel vehicles, computers, scanners, cameras, and LCD projectors. The reason for the procurement of additional equipment was to establish adequate project implementation and management system as the executing agency. Since the project was implemented at nationwide, procurement of the additional equipment was relevant. The equipment procured was in good condition. Most of the equipment are still being used by the executing agency (at the central and local levels especially in the on-going Phase III of the project).

(4) Consulting Services

The consulting services consist of: 1) assistance for overall project management, 2) assistance for institutional development components, 3) assistance for infrastructure development components, and 4) training of the Philippines' government officials were implemented as per the plan. However, the project period was extended due to the extension of the civil works during the project implementation. As a result, M/M of international consultants was increased to 112%, and local consultants to 114% when compared to the plan. The major reasons for the extension were issues related to land acquisition, bad weather conditions, and natural disasters. The executing agency was highly satisfied with the performance of the consultants.

Training of government officials was organized in Japan, Singapore, and Thailand. The training courses covered a variety of subjects, including project planning and management and risk

[12] Life of the procured computer is approximately 5-year according to DAR. Thus, there are some computers already disposed by DAR at the time of the ex-post evaluation.

management, as well as mechanism of farmers' associations in Japan. According to the interviews conducted with the staff members of DAR who participated in the training (mainly at the central level), the training was generally effective.

3.2.2 Project Inputs

3.2.2.1 Project Cost (Sub-rating: ③)

The project cost was estimated as 20,222 million yen (yen loan portion was 16,990 million yen) initially. However, the scope of the civil works was reduced to 73% of the plan in 2004, which was after the project started. Accordingly, comparisons between the revised plan that reflected the reduced scope and project cost and the actual plan were made[13]. The revised planned project cost was 84% of the planned cost, which was 17,027 million yen. When the revised project cost was compared to the actual project cost of 15,074 million yen (yen loan portion was 12,333 million), only 89% of the revised cost was spent in yen currency, which was within the plan. The main reasons were the release of the funds covered by local currency portion was less than originally planned and appreciation of yen during the project period.

3.2.2.2 Project Period (Sub-rating: ②)

When the project was planned, the project period was December 1999 to December 2004 (61 months). The actual project period was December 1999 to June 2007 (91 months). Therefore the project period exceeded the plan, and the ratio of the actual to the plan rose to 149%.

The project conducted baseline data survey at the 150 ARCs. Based on the conditions, some ARCs were replaced by other ARCs. After newly selected ARCs were added to the project, the same survey was conducted to collect baseline data. The baseline data collection period took longer than originally estimated. This was the main reason for delay in the implementation of civil works and institutional development components. Despite the extension and delay in the project period, the changes made to the selected ARCs were relevant to the needs of the project areas.

The main reason for delays in the project period after finalizing the 150 ARCs for the project included suspension of funds disbursement by the GoP[14], and the repair of facilities damaged by typhoons and floods in 2006. According to the executing agency, unsynchronized cropping seasons of agricultural production made it difficult to carry out the project activities as planned. As highlighted in Table 3, an additional 29 M/M was incurred to complete institutional development, which caused the delay of consulting services. The yen portion of the project funds were disbursed as planned. However, the GoP portion was not disbursed as planned. Thus, the starting time of the institutional development component had to slide back. Delays due to natural disasters such as typhoons and floods were

[13] Average exchange rate from January 2000 to December 2006 was 1 peso=2.22 yen. This rate was applied when calculating the revised planned project cost.

[14] According to the executive agency, the project funds were not disbursed at the initial stage of project implementation: therefore, the project activities were temporary reduced and delayed. In 2004 and 2006, negative influence affected the progress of the project, which was because of financial deficit of the GoP as a whole. To response to the problem, the project scope and funds allocation covered by the yen portion was revised.

external factors that DAR could not avoid.

Table 3: Project Period – Plan and Actual

Scope	Plan (M/M)	Actual (M/M)	Reason for delay/extension	Gap
Institutional development	January 2001-December 2004 (46)	January 2001-June 2007 (75)	• Delay in civil works • Delay in disbursement of the GoP's funding	29
Consulting services	September 2000-December 2004 (58)	April 2001-June 2007 (87)	• Right-of-way • Rehabilitation of facilities damaged by natural disaster such as typhoon and flood	29
Civil works	September 2000-December 2004 (50)	April 2001-June 2007 (72)	• Change in scope • Additional construction	22

Source: DAR (July 2011)

For the above reasons, although the project cost was within the plan, the project period was exceeded, therefore efficiency of the project is fair.

3.3 Effectiveness (Rating: ③)

3.3.1 Quantitative Effects

3.3.1.1 Results from Operation and Effect Indicators

Indicators typically applied to assess the effectiveness of projects related to agriculture and irrigation include ARC population, irrigated land area, paddy production volume, cropping intensity, and net income from farming per household in the project areas. However, only limited data pertaining to the indicators listed above were collected during the ex-post evaluation. According to paddy production data, the actual was 102% compared to the plan. Training courses such as irrigation water management, farm inputs (i.e., fertilizers and seeds), and farming technology, which were critical for effective paddy production were conducted in the project. These training courses contributed to improvement of farm management technology through technology transfer, thereby increase in paddy cropping cycle, improvement of paddy production technology, and introduction of improved variety were realized.

In addition, responses to the questionnaire from the executive agency as well as data from the Assessment of the Level of Development of Agrarian Reform Communities (ALDA) indicators[15] were used as substitute for unavailable data. Assessment of development level fluctuation for the 150 ARCs selected in the project was conducted. Qualitative effectiveness of the project based on the ALDA ratings is shown in Table 4. There was no change concerning the number of the target ARCs

[15] DAR conducts ALDA every year. ALDA consists of 6 indicators namely 1) land tenure improvement (LTI), 2) organizational maturity, 3) economic and physical infrastructure support services, 4) farm productivity and income, 5) basic social services, and 6) gender and development is a monitoring tool used to assess development progress of each ARC. ALDA is conducted in the areas where JICA, Asian Development Bank and other developing partners provide assistance in addition to the areas where the GoP independently implement projects. In the project, LTI level of 76 to 100% was one of the criteria in target ARC selection. The objectives of LTI were 1) transfer of land ownership (including transfer of land without land ownership to small-scale farmers), and 2) legal assistance for pending lawsuits.

being 150, however, some ARCs were replaced. Instead of the ARCs originally selected, ALDA ratings of the actual ARCs selected for the project was compared from the time of the revision in 2004, the time of project completion in 2007, and after the project completion in 2010. DAR annually conducts assessment of development progress per ARC, and determines overall development levels accordingly. As shown in Table 4, the ratings are divided into 5 levels specifically 5: very high, 4: high, 3: moderate, 2: low, and 1: very low. There were 73% of ARCs rated as high and above (level 5 and 4) in 2004. The percentage was increased to 87% at the same areas in 2010. After the project completion, there was no longer any ARC rated as level 1, which indicated very low at development level. Hence, it can be said that development is in progress in the project areas, thereby living conditions of farmers are improving.

Table 4: Development Level According to ALDA

Development level	ARC (unit)	
	2004	2010
5	60	92
4	50	35
3	28	15
2	9	4
1	3	0
Total	150	146*

*ALDA data of 146 out of 150 ARCs were collected.
Source: DAR (July 2011)

In addition, data related to effectiveness of the irrigation and drainage facilities developed in the project were collected from NIA, the cooperative agency, for some of the project areas visited during the site. The results of comparisons between 2007: at the project completion and 2010: three years after the project completion are shown in Table 5.

Data collected from three provinces namely Ilocos Norte, Oriental Mindoro and Davao Oriental showed the project effectiveness in regard to irrigable area[16], net income of farmers, and effectiveness of IAs to some extent. According to items listed on the far left column in the table below, 3. Irrigation water distribution area[17] had no change since the construction of the irrigation facilities was completed at the time of project completion. In regard to 4. Irrigable area, there was a good increase in Ilocos Norte. In Oriental Mindoro, there was also a slight increase in part of the irrigated area during wet season. Owing to the increase in the irrigable area, volume of irrigation water flown to paddy field was adjusted in a more adequate manner in these two provinces. Hence, the project is deemed to be instrumental for the increase in agricultural productivity in these provinces when reviewed along with the figure fluctuation of *5. Net income*[18]. *5. Net Income* increased expect dry season of Oriental Mindoro. There was no 2007 data for Davao Oriental, so that it could not be compared to 2010 data.

[16] Irrigable area indicates actual area of paddy field using irrigation water.
[17] Irrigation water distribution area indicates area of paddy field, which receives irrigation water from the irrigation facilities developed in the project.
[18] Net farm income basically comes from paddy sales.

Based on the interviews during the beneficiary survey, there was an increase in net income. *6. IA organizational maturity level* is an assessment of organizational maturity of IAs at nationwide by NIA every year. This maturity level is calculated from indicators such as number of IA members, agricultural production volume and production cost, net income, loan repayment rate to NIA as a whole. 112 point (full points) is set as "Fully matured" for rating of the maturity level. Based on the rating, 1) Ilocos Norte was improved from 85 to 93, 2) Oriental Mindoro was dropped from 81 to 71 on average, and 3) there was no change in Davao Oriental. However, agricultural productivity in Oriental Mindoro decreased from 2010 to 2007; therefore, IA maturity level in the province dropped. Flooding due to typhoon hit the province in 2009 had negative influence, and caused the rating to drop. This could not have been prevented by farmers in the area, therefore, it is considered as external factor. In other words, this lowering of the rating could be thought as temporary conditions for Oriental Mindoro.

According to the result illustrated above, the facilities developed in the project are assumed to be contributing to improvement of agricultural productivity in the project areas.

Table 5: Effectiveness of the small-scale infrastructure constructed in the project – project completion and ex-post evaluation

Item	Project completed (Year 2007)			Year 2010		
1. Target province	Ilocos Norte	Oriental Mindoro	Davao Oriental	Ilocos Norte	Oriental Mindoro	Davao Oriental
2. Target irrigation and drainage facility	Estancia	Banus ①Upstream ②Downstream	Tibanban	Estancia	Banus ①Upstream ②Downstream	Tibanban
3. Irrigation water distribution area (ha)	113	①70 ②103	287	113	①70 ②103	287
4. Irrigable area (ha)						
Dry	95	①70 ②40	206	113	①70 ②40	206
Wet	－	①70 ②40	206	113	①70 ②50	206
5. Net income (PHP/ha)						
Dry	23,500	①15,300 ②13,500	－	48,700	①13,500 ②19,250	30,250
Wet	－	①15,300 ②13,500		34,920	①20,000 ②18,000	28,000
6. IA organizational maturity level	85	81	86	93	①76 ②65	86

Source: NIA (July 2011)

3.3.1.2 Results of Calculations of Internal Rates of Return (IRR)

The Economic Internal Rate of Return (EIRR) at the time of the appraisal was 25.4% for the project. When the EIRR was recalculated during the ex-post evaluation, it was 14.2%. A decrease in

the EIRR from the time of the appraisal was due to a reduction in project benefits and an increase in project costs. The main factor behind the project benefit reduction was a decrease in agricultural production caused by unstable weather conditions. Factors behind the increase in project costs included a rise in project costs caused by the extension of the project period, additional costs accrued to repair facilities damaged during the project period, and an escalation in agricultural input prices such as fertilizers that led to an increase in production costs.

3.3.2 Qualitative Effects

During the ex-post evaluation, a simplified beneficiary survey[19] was administered to a focus group of 144 ARCs not selected for site visits. The survey was structured to compare the conditions of these ARCs before and after the project. The results of the survey showed increases in irrigable land, access to irrigation water, improvement of farming techniques and agricultural productivity, and paddy production volume. The results of the simplified beneficiary survey on irrigable land, irrigation water, paddy production volume, cropping pattern, and farming technique are as follows:

- Irrigable area: *Increased considerably* (response rate of 45%), *Increased slightly* (response rate of 37%), *No change* (response rate of 18%)
- Irrigation water supply: More than half of the respondents felt irrigation water supply was increased when compared between the pre-project and the post-project (see Figure 1 for detail)
- Cropping frequency: *Single* to *double* (response rate of 48%), *Double to more than 3 times* (response rate of 31%), and *No change* (response rate of 21%)
- Paddy production (wet season): *Increased* (response rate of 71%), *Not increased* (response rate of 29%)
- Paddy production (dry season): *Increased* (response rate of 68%), *Not increased* (response rate of 32%)
- Farming technology: *Improved* (response rate of 94%), *No change* (response rate of 6%)

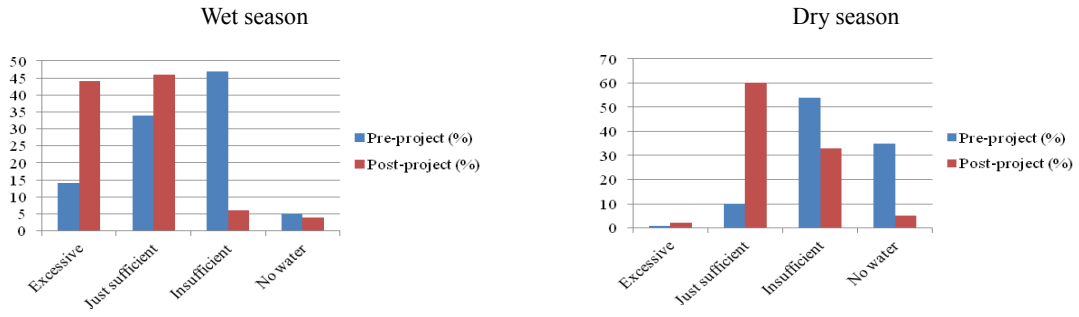

Figure 1: Access to Irrigation Water – Wet and Dry (simplified beneficiary survey)
Source: Beneficiary survey at ex-post evaluation

[19] Simplified beneficiary survey was targeted to 144 out of 150 ARCs, which were selected for the project (responses from 139 ARCs were collected). The survey was a summary of the beneficiary survey questionnaire that was conducted during the ex-post evaluation. The response style was mainly to select one response the best answer out of the choices of 2 to 5.

To assess the project's effectiveness and impact, a beneficiary survey[20] was administered to 100 ARC members each residing in one of the six selected areas (see 3.4. for impact). The 100 persons were selected randomly. Response to the survey was chosen normally from two to five answer options per question. The survey results revealed that the increases in farm-to-market roads, farmland, and access to irrigation water contributed to increases in the variety and volume of agricultural production capacity. As a result, production volume has been improved.

The detailed survey results are as follows:

- Agricultural productivity was improved owing to availability of adequate irrigation water as the result of the development of the irrigation systems (response rate of 66%). Similarly, it was felt cropping frequency was increased from single to double in some of the project areas (response rate of 71%).
- Irrigation water supply was increased when compared to pre-project. 56% of farmers felt access to irrigation water supply was just sufficient before the project implementation. 71% felt the supply was just sufficient after the project implementation (see Figure 2).
- Owing to improvement of access to irrigation water, bell peppers, chili peppers, peanuts were produced instead of paddy, which had low sales value. Variation of income source was widened as the result of utilization of organic fertilizer, new farming technology, etc. (response rate of 84%).
- Access to market and nearby areas in the project areas was improved. As a result, distribution routes were secured (response rate of 99%).
- After the project completion, 13% of farmers felt their paddy field was expanded. 34% felt their paddy field was expanded to some extent. On the other hand, 49% felt no change. 4% felt their paddy field was reduced.
- Adequate space to store paddy was secured as the result of the construction of post-harvest facilities.

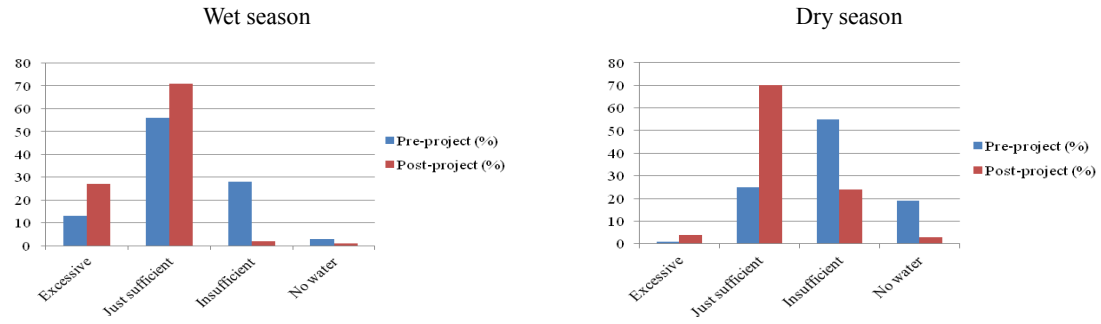

Figure 2: Access to Irrigation Water – Wet and Dry (beneficiary survey)
Source: Beneficiary survey at ex-post evaluation

[20] Beneficiary survey was conducted in 6 out of 150 ARCs in the project areas. Farmers groups and LGUs at each ARC were the main respondents of interviews during the survey. The questionnaire used during the ex-post evaluation was developed by the external evaluator of the ex-post evaluation, and the response style was a combination of multiple choice and narrative form.

The results of the beneficiary survey highlighted in 3.2.1 confirmed not only the expected outputs but also that the expected outcomes of the project were realized as planned to some extent.

The project has largely achieved its objectives; therefore, its effectiveness is high.

3.4 Impact

3.4.1 Intended Impacts

The expected impacts of the project were 1) improvement of living environment by agrarian reform (increase in net farm income, improvement of health and sanitation, increase in water supply percentage), and 2) growth of local economy. In regard to 1), household income as shown below is increasing, thereby living environment is improving. In related to 2), condition of local economy is improving based on the results of the interviews to farmers and LGUs in the project areas as shown below. As the result of the development of essential infrastructure, living environment in the project areas is improving, thereby the expected impact of the project was realized.

Figure 3: Farmers at paddy field using the irrigation facility developed in the project

(1) Livelihood improvement through agrarian reform

81% (response rate) of farmers in the project felt *income at household level was increased*[21]. These farmers expressed that cost of fertilizers and agricultural inputs increased when compared to pre-project, which was relative to increase in farm income. Thus, 80% of respondents felt *production cost was increased*. Majority of these farmers felt access to potable water supply system as well as health and sanitation conditions were improved owing to the project implementation. The results of the beneficiary survey were as follows.

Almost all of the respondents felt their feeling of commitment to local communities and living environments were improved owing to the development of essential infrastructure.

- 28% (response rate) felt their household income (net income) was *increased considerably*, 53% felt *increased slightly*, 14% felt *no change*, and 5% felt *decreased*. The major factor of increase in income was the multiplication of cropping frequency. Natural calamity, insect infestation, and high production cost were thought as the factors of decrease in income.
- 22% felt *annual average production cost was increased considerably*, 59% felt *increased slightly*, 16% felt *no change*, and 3% felt *decreased*. The reason for increase in production cost was increase in planted area, and was not because of increase in cost per unit area.
- In regard to health and sanitation aspect such as waterborne diseases, 56% felt *considerably*

[21] Income per household in the project areas consists of farm and non-farm income. After the project completion, development of the irrigation and drainage facilities and training of farmers contributed to 1) increase of cropping frequency from single to double, 2) improvement of paddy production technology, and 3) introduction of improved variety. It is noted that non-farm income may also be increased among families who opened own business as the result of farm-to-market road development,

improved after the project completion, 17% felt *slightly increased*, and 27% felt *no change*. Installation of potable water supply system was the factor for improvement of health and sanitation conditions in the project area when compared before the project implementation. Similarly, time spent for fetching water by women and children was reduced owing to the potable water supply system. Those women and children gained time for other activities such as child care for women and study for children. Identified quantifiable impacts are shown in Table 6.

Table 6: Benefits to the Residents in the Project Areas

Indicator	Project started (Year 2001)	Project completed (Year 2007)
Travel time（minutes/one-way）	27	24
Travel time for fetching water (minutes)	120～180	30
Distance for fetching water (meter/one-way)	32.3	29.1

Source: DAR (May 2011)

(2) Growth of local economy

At the time of the ex-post evaluation, results of the interviews to LGUs and the beneficiary survey were referred to assess growth level of local economy. According to LGUs, land value was slightly increased owing to development of irrigation facilities and farm-to-market roads. Houses and commercial buildings were constructed along the farm-to-market roads developed after the project completion. According to residents in the project areas, development of farm-to-market roads played critical role such as 1) small general stores were opened along the roads developed in the project, 2) taxi service using two-wheel and three-wheel vehicles were provided, and 3) local distribution functions became brisk. Some farmers in the project areas felt their living environments were improved and became convenient, while their daily expenses were slightly increased. The reasons were use of taxi service as mentioned above and availability of daily goods when compared to pre-project.

According to the conditions stated above, in addition to response of farmers (previous page) feeling that their income is increased, it is predicted that local economic level in the project areas is in growth process. Although the project impact is difficult to quantify, it can be said that the project is contributing to economic growth of the project areas to some extent.

3.4.2 Other Impacts

The followings were the others impacts of the project.

(1) Impacts on the Natural Environment

Coco nets were utilized as alternative technology to protect the farm-to-market roads against soil erosion. These coco nets were made from coconut shells. This approach brought benefits such as effective use of locally wasted resource and prevention of land slide. According to interviews with LGUs and residents in the project areas, there were no specific problems in regard to outflow of earth materials during the construction stage, conservation of forest areas, and water pollution of the

drainage including gray water, and air and noise. These were initially identified as potential problems at the time of appraisal. Hence, no negative impact from environmental view point was found.

(2) Land Acquisition and Resettlement

No resettlement was required in the project. Land was provided to DAR from concerned owners at no cost. Therefore, no negative impact was observed.

Therefore, the project has improved paddy production in the project areas, and is contributing to improvement of livelihoods in the project areas to some extent.

3.5 Sustainability (Rating: ②)

3.5.1 Structural Aspects of Operation and Maintenance

The O&M structure of the facilities developed in the project were agreed and conducted as shown in Table 7; 1) irrigation and drainage facilities by IAs, 2) farm-to-market roads by LGUs, 3) post-harvest facilities by cooperatives or IAs, and 4) potable water supply systems by WUAs. According to the questionnaire administered to 150 ARCs in the project areas, the O&M structure has been followed as planned. The majority of the institutions and the groups responsible for O&M assign enough workers, and understand their roles and responsibilities given to them Therefore, no major problems have been observed. The O&M structure shown in Table 7 is practiced in the other 144 ARCs in the project areas.

The executing agency and the cooperative agencies are not part of the post-project O&M structure. The reasons are promotion of decentralization and promotion and implementation of participatory and community-based projects in the Philippines.

Table 7: O&M Status – Organizational Aspect

Facilities	Organization/institution responsible for O&M	Role
Irrigation and drainage facility	IAs	Patrolling around irrigation facilities developed in the project, cleaning, collection of irrigation water user fee, rehabilitation, etc.
Farm-to-market road	LGUs in the project areas	Checking, cleaning, and rehabilitation, etc. of the road developed in the project.
Post-harvest facility	Cooperatives and/or IAs	Cleaning and rehabilitation, etc. (User fees are collected in some roads)
Potable water supply system	WUAs	Checking of water supply pump station, exchange of spare parts, rehabilitation, etc.
Equipment	DAR	Periodical check, exchange of spare parts, rehabilitation, etc.

Source: Beneficiary survey at ex-post evaluation (July 2011)

3.5.2 Technical Aspects of Operation and Maintenance

According to the interviews with the executing agency and the cooperative agencies, LGUs and farmers groups (IA, cooperatives, and WUAs), which are responsible for operation and maintenance (O&M) of the facilities developed in the project, have basic technical capacities for day-to-day O&M of the facilities. The questionnaire addressed to the farmers groups confirmed the similar results. The

current O&M status from a technical viewpoint is shown in Table 8.

Table 8: O&M Status – Technical Aspect

Facility	Actual
Irrigation and drainage facility	Problems were found in some of the project area. The problems are unplanned cropping conversion and irregular cropping cycles which disturbed effective use of irrigation water as well as low coordination capacity of flow of irrigation water.
Farm-to-market road	Engineers who are working for LGUs are responsible. No major problems were observed.
Post-harvest facility	No major problem was identified owing to technical assistance provided by the Department of Agriculture.
Potable water supply system	WUAs conducted repair works when/as needed. Thus, the systems were in use.
Equipment	No major problem was found. During the site visit at the time of ex-post evaluation, the external evaluator visited DAR regional offices. The equipment stationed in the offices was in good condition and use.

Source: Beneficiary survey at ex-post evaluation (July 2011)

The technical capacity of some IAs must be strengthened (particularly as concerns irrigation water management). There are no major problems from the technical viewpoint.

3.5.3 Financial Aspects of Operation and Maintenance

According to the hearings from the executing agency, the cooperative agencies, and LGUs and farmers groups that are responsible for O&M, the current financial aspects of the O&M are as shown in Table 9. The financial matters of irrigation and drainage facilities by IAs, farm-to-market roads by LGUs, post-harvest facilities by cooperatives, and potable water supply systems by WUAs, was managed as per the agreed by-laws and regulations developed by each group and LGU. DAR as the executing agency is financially responsible for O&M of the equipments procured in the project. Typically in the Philippines, NIA is responsible for construction and O&M of medium to large-scale irrigation systems. LGUs are responsible for construction of small-scale irrigation systems, and such systems are operated and maintained by IAs.

The sustainability of the project from a financial viewpoint was assessed during the ex-post evaluation. No major problems were found with the farm-to-road-market roads, the post-harvest facilities, the potable water supply systems, or the equipment. However, the irrigation and drainage facilities could be improved. Financial aspect of the O&M structure, as agreed by DAR, NIA, and concerned IAs, required that irrigation water usage fees are collected from IA members in the project areas. Part of the collected fees is to be allocated for O&M. However, most of the IAs had not been able to achieve the goal of 100% collection of user fees. IAs with low collection percentages had not been able to secure adequate funds for O&M.

Table 9: O&M Status– Financial Aspect

Facility	Plan	Actual (during the ex-post evaluation)
Irrigation and drainage facility	100% of irrigation water user fees are collected from the IA members.	Collection rate is below 100% considerably. Collection rates vary among IAs. There are IAs which do not collect such fees at all. On the other hand, there are IAs which collect close to 100%. The factors for not being able to collect 100% are 1) maturity and leadership levels of IAs are low, and 2) some IAs do not have ability to pay irrigation water user fees.
Farm-to-market road	O&M is covered in annual budget allocated to LGUs (every year, some funds are allocated towards O&M at LGU level). Natural Calamity Funds are used in case of emergency.	Proceeded as planned. No major problems were observed since no major repair work had been required till now.
Post-harvest facility	Service type[22]: 100% user fees are collected from Cooperative members. Commercial type[23]: covered by proceeds of the sales by Cooperative(s).	Proceeded as planned. Generally speaking, maturity level of Cooperatives is higher than the IAs, and strong leadership and management abilities are shown. Thus, no major problems were observed.
Potable water supply system	O&M fees are collected from the WUA members.	Proceeded as planned. Each WUA agreed on amount and payment method for collection. If cash payment cannot be made, manpower is given by concerned WUA member(s). The collection fees are set at minimum level. This arrangement was working well.
Equipment	Covered by annual budget allocated to DAR.	Proceeded as planned. Computers expire after 5 years. Thus, some computers had been disposed after 5 years. Other equipment is still in use by DAR (central and local levels).

Source: Beneficiary survey during the ex-post evaluation (July 2011)

3.5.4 Current Status of Operation and Maintenance

According to the beneficiary survey and the simplified questionnaire conducted during the ex-post evaluation, the facilities developed in the project are well operated and managed, and are in effectively use by the communities in the project areas. However, there are some problems. In some small areas, paddy is not produced, since a line canal was partly damaged by typhoons and floods, and is not yet repaired (see Box 1). Some IAs could not synchronize agricultural cultivation period in their areas. Hence, irrigation water was flowing throughout the year, and O&M of line canals could not be conducted. In addition, it was found that some IAs were not able to control flow of irrigation water. When irrigation water is discharged in an uncontrolled manner, paddy fields are flooded and paddy roots are spoiled.

[22] Service type means that post-harvest facilities are lent to store mainly paddy by Cooperative members.
[23] Commercial type means that post-harvest facilities are used to store paddy for trading by Cooperatives.

Box 1: Current Condition of Irrigation and Drainage Facility in Gloria ARC, Oriental Mindoro

＜Partly damaged line canal＞

Oriental Mindoro is located in the northern part of the Philippines. As shown in the photo (see right), downstream portion of the line canal developed in the project was partly damaged due to typhoon occurred in 2009 at Gloria ARC, Oriental Mindoro. The responsible IA of the canal stopped its operation right after the establishment of the association. Hence, no O&M was made to the facilities. The canal was left as partly damaged for two years. At the time of ex-post evaluation, the IA received advice from DAR in order to strengthen the IA's capacity. The IA is not at any condition to repair the canal by itself. DAR (regional office) is in coordination with LGU and NIA (regional office) in the area to find ways to assist the IA.

Figure 4: Partly damaged line canal

The pictures below were taken during the site visit. As shown, the facilities developed in the project are currently in use. A visual inspection of the post-harvest storages and potable water supply systems revealed no major problems. Partial deterioration to the surfaces of the farm-to-market roads was found. There is a room for improvement in road maintenance; therefore, concerned LGUs were called for necessary actions.

Figure 5: Potable water supply provided

Figure 6: Storage and solar dryer provided

Figure 7: Bridge constructed

Figure 8: Farm-to-market road constructed

Some minor problems have been observed concerning the technical and financial aspects of the O&M of this project; therefore, the sustainability of the project effect is fair.

4. Conclusion, Lessons Learned, and Recommendations

4.1 Conclusion

The project has been highly relevant to the Philippines's development plan and development needs, as well as Japan's ODA policy for the Philippines; therefore, its relevance is high. Some changes were made to the project scope because of actual needs of the local communities in the project areas. The revised scope facilitated the achievement of the project purpose. Although the project cost was within the plan, the project period was exceeded; therefore, the project efficiency is fair. The project's

effectiveness is high, since it has largely achieved its objectives. For example, the irrigable area increased owing to development of small-scale irrigation and drainage facilities in the project areas. In addition, most of the other basic and essential infrastructure was developed in the project areas as planned. The construction of these facilities improved transport access and potable water supplies in the project areas, thereby livelihood of farmers in the project areas are improving. Thus, the impact of the project is high. Some uncertain problems were observed in terms of technical and financial aspects of the O&M of the project; therefore, sustainability of the project effect is fair. In light of the above, the project is evaluated to be satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

The recommendation to DAR, the executive agency of the project, is to conduct monitoring of the O&M status of all irrigation and drainage facilities developed in the project once or twice a year. The monitoring purpose is to identify groups (IAs, cooperatives, and WUAs) of which organizational maturity level is low, and to provide appropriate advice. DAR shall release necessary funds for the above monitoring activities.

In addition, it is suggested that DAR works closely with NIA, which was responsible for construction of the irrigation and drainage facilities and technical advisory related to O&M of these facilities, to take countermeasures in order to enhance the O&M capacity of the IAs as follows:

- Appropriateness of irrigation water management technique in regard to the IAs whose capacities were developed in the project. The reason is due to insufficient irrigation water management carried out by some IAs. NIA is expected to immediately verify the actual situations, and provide technical assistance on irrigation water management as needed. As a result, it is expected that irrigation water is distributed to farmers in the project areas more effectively.
- Through NIA's regional offices, raising-awareness activities are conducted aiming to increase fee collection rate from the IAs in the project.
- Necessary funds are released to carry out these proposed activities listed above.

4.2.2 Recommendations to JICA

No particular recommendations.

4.3 Lessons Learned

The IAs conduct the O&M of the irrigation and drainage facilities developed in the project. Neither DAR nor NIA is monitoring activities of the IAs in the project areas from a technical viewpoint after the project completion. DAR and LGUs, with the technical cooperation of NIA, shall not only provide continuous technical assistance but also monitor the IAs of which organizational maturity is low when similar projects are implemented, since there are some cases where these facilities are not working effectively.

Comparison of the Original and Actual Scope of the Project

Item	Plan	Actual
1.Project Outputs <Civil Works> Irrigation and Drainage facilities (ha.) Farm-to-Market Road (km) Post-harvest facilities Potable water supply system (unit)	 43,433 766 122 66	 31,595 646 68 82
<Institutional Development> (unit)	 ARCs:150 LGUs:66	 ARCs:150 LGUs:82
<Procurement of Equipment> 4-wheel vehicle (unit) Computer set (unit)	 80 80	 84 279
(Additional Equipment) Copier (unit) Scanner (unit) Camera (unit) 2-wheel vehicle (unit) LCD Projector		(Additional Equipment) 2 20 84 150 76
<Consulting Services> (M/M)	 Foreign experts:260 Local experts:630	 Foreign experts:292 Local experts:717
2.Project Period	December, 1999～December, 2004 (61 months)	December, 1999～March, 2007 (88 months)
3.Project Cost Foreign Currency Local Currency Total Japanese ODA Loan Exchange Rate	 6,411 million yen 13,811 million yen (Local Currency 4,604 million peso) 20,222 million yen 16,990 million yen 1 Philippines Peso=3 yen (As of January 1999)	 1,352 million yen 13,722 million yen (Local currency 1,211 million peso) 15,074 million yen 12,333 million yen 1 Philippines peso=2.22 yen (Average during January 2000～December 2006)

The Republic of the Philippines

Ex-Post Evaluation of Japanese ODA Loan Project
New Iloilo Airport Development Project

External Evaluator: Ryujiro Sasao, IC Net Limited

0. Summary

This project aims to respond to the increase in passengers and cargo demand and also to improve the safety of airline service by constructing a new airport in the suburbs of Ilopilo city in Iloilo province. The project suits the development policies and needs of the Philippines and also the Japanese government's aid policies. Accordingly, the relevance is high. Aircraft landings and takeoffs, cargo volume and the numbers of passengers are growing steadily and passengers' satisfaction is high, which means high effectiveness. The impact on the local economy in terms of the increase of enterprises and commercial facilities has appeared.

However, as the implementation period was prolonged and the project cost slightly exceeded the plan, the project's efficiency is fair. With regard to the operation and maintenance, no major problems have been observed in terms of organization, technology and finance, therefore sustainability of the effect realized by the project is high.

In light of the above, this project is evaluated to be highly satisfactory.

1. Project Description

Project Location


New Iloilo airport (Passenger Terminal)

1.1 Background

Although the share of air transport in the entire domestic transport sector of the Philippines was relatively small, the share was steadily increasing: average annual growth rates between 1991 and 1998 were 4.7% for passenger transport and 12.5% for cargo transport. Air transport was recognized as one of the necessary conditions for economic development in terms of speed, accuracy, comfort and

so on. Furthermore, in the Philippines, a country with more than 7,000 islands, air transport was expected to play a more important role in both passenger and cargo transport in accordance with economic development and increase in income.

At the time of the project appraisal, there were 86 airports managed by the Government of the Philippines with the following breakdown: international airports: 8; arterial airports: 12; local airports: 36; and branch airports: 30. Until that time, large-scale airport development or expansion was limited to the international airports such as Manila, Cebu, and Davao. However, the government wanted to set up one airport in each of the 13 Regions[1] that meets the international standards, i.e., ICAO ones. Thus the government has conducted development and expansion of the high-ranking airports in terms of number of domestic passengers.

The existing Iloilo Airport was an arterial airport for domestic use located in Panay Island in Visayas, the middle part of the Philippines[2]. With 690,000 passengers in 1997, the airport is the fourth largest in the country next to Manila, Mactan (Cebu) and Davao in terms of number of passengers. On average from 1990 to 1997, the airport had the share of 5.0% of the total passengers and 3.3% of the total cargo of the Philippines. On average from 1991 to 1998, the annual growth of number of passengers was 8.3%, and the growth in cargo transport volume was 4.7%. Similar growth was expected in the future.

1.2 Project Outline

The objective of this project is as follows: to respond to the increase in passengers and cargo demand and also to improve the safety of airline service by constructing a new airport with a 2,500-m runway in the suburbs of Iloilo City in Iloilo province of Panay Island, thereby contributing to the sustainable economic and social development of Panay Island and its neighboring regions.

Loan Approved Amount/ Disbursed Amount	14,724 million yen / 14,322 million yen
Exchange of Notes Date/ Loan Agreement Signing Date	August 2000 / August 2000
Terms and Conditions	(Construction) Interest Rate: 0.95% Repayment Period: 40 years (Grace Period: 10 years) (Consulting service) Interest Rate: 0.75% Repayment Period: 40 years (Grace Period: 10 years) Note: This is a special yen loan[3].

[1] Administrative unit in the Philippines. There are 17 regions in total. A region consists of provinces and there are 81 provinces.
[2] Source of information in this paragraph is the appraisal document.
[3] This project was implemented utilizing the Special Yen Loan (SYL). SYL was introduced by the Government of Japan in 1998 as one of the financial relief measures for Asian countries suffered from the Asian economic crisis. SYL was to provide

Borrower / Executing Agency(ies)	Government of the Philippines/ Department of Transportation and Communications (DOTC)
Final Disbursement Date	August 2008
Main Contractor	Taisei Corporation (Japan)・Shimizu Corporation (Japan) (JV)
Main Consultant	Japan Airport Consultants, Inc. (Japan)・Basic Technology and Management Corporation (Philippines)・Phil. Jac, Inc. (Philippines) (JV)
Feasibility Studies, etc.	JICA's Master Plan (M/P) study on the development of major local airports(May, 1996), Conducting F/S by DOTC based on the above M/P (January, 1997) Review of M/P and F/S by DOTC (December, 1999)
Related Projects	(Yen loan) "Navigation and Surveillance / Air Traffic Management (CNS/ATM) System Development"(L/A signed in March, 2002) (Technical cooperation) Master Plan (M/P) study on the development of major local airports by JICA (May, 1996), Dispatch of a JICA expert to Air Transportation Office (ATO)

2. Outline of the Evaluation Study

2.1 External Evaluator

Ryujiro Sasao, IC Net Limited

2.2 Duration of Evaluation Study

Duration of the Study: January-December 2011

Duration of the Field Study: March 29-April 18, 2011, June 8-25, 2011, September 25-October 9, 2011

2.3 Constraints during the Evaluation Study

None in particular

concessionary financial assistance for the development of infrastructures in the fields of transportation logistics, foundation for productive facilities and large-scale disaster prevention. The terms and conditions of SYL is set at greater concessionary level than standard terms and conditions of ODA loans, while the eligibility of the prime contractors under SYL is limited to Japanese nationals or judicial persons and procurement of goods and services under SYL is tied to Japanese goods and services (goods and services whose country of origin being other than Japan can be procured up to no more than 50% of the total loan amount).

3. Results of the Evaluation (Overall Rating: A[4])

3.1 Relevance (Rating: ③[5])

3.1.1 Relevance with the Development Plan of the Republic of the Philippines

At the time of the appraisal, the "Medium-Term Philippine Development Plan 1993-1998" aimed at the establishment of transport infrastructure and the modernization of facilities and, ultimately, economic growth through export promotion through the use of airports. The Philippine government adopted a liberalization policy for the airline industry and aimed to expand the air routes by having companies other than Philippine Air participate in the domestic airline business in places where Philippine Air had been dominant. At the time of the ex-post evaluation, in the "Medium Term Philippines Development Plan (2004-2010)", with regard to the airport sector, the following policies are raised.

- To give priority to the airport projects that improve access to regional core cities and major sightseeing spots.
- To improve the sustainability of airport business by securing a certain seat occupancy rate level and by fully recovering the costs of investment to the airport and also for various kinds of service.

At the time of the appraisal, it was deemed necessary to improve the airports from the point of view of policies targeting economic growth. At the time of the ex-post evaluation, better access to local core cities and major sightseeing spots was needed and the new Iloilo Airport project met this need.

As discussed above, not only at the time of the appraisal but also at the ex-post evaluation, the importance of airport improvement in the national development plans remains strong. Accordingly, its relevance is high.

3.1.2 Relevance with the Development Needs of the Republic of the Philippines

The existing Iloilo Airport is the fourth biggest airport in the Philippines. Its annual growth rate of passengers was 8.3% and cargo was 4.7% on average from 1991 to 1998[6]. A similar growth was expected in the future. Due to the expected future growth in demand, major airliners using the Iloilo airport such as Philippine Air were considering the introduction of the Airbus – A 330 and similar-sized airplanes into service. According to the ICAO standard, a 2,500m long runway was needed to introduce such airplanes. However, the length of the previous runway was only 2,100 m. Although the expansion of the existing airport was studied, there were roads and construction in the north of the runway and the south faced a river. Thus the expansion of the existing airport was physically difficult, and the construction of a new airport elsewhere became necessary.

Actual number of passengers and delivered cargo volume in 2010 are, respectively, 1.57 million

[4] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory
[5] ③: High; ②: Fair; ①: Low
[6] Source: Appraisal documents

and 11,820 tons[7]. These are much bigger than the forecasted 1.22 million and 11,500 tons for the same year and the needs bigger than the one projected at planning stage are well confirmed.

As mentioned above, the development needs at the appraisal were confirmed by the statistics retroactively. Air transport of this scale may not have been realized without the spacious new airport and there were certain needs for the project.

3.1.3 Relevance with Japan's ODA Policy

The Japanese government has provided the Philippines' airport sector with support for the improvement of international and arterial airports and the corresponding security facilities by yen loan. JICA's Overseas Economic Cooperation Policy at the time of appraisal also gave priority to this sector.

This project belongs to the prioritized airport sector and is in line with the Japanese government's aid policy for the Philippines.

In light of the above, this project has been highly relevant to the country's development plan, development needs, as well as to Japan's ODA policy. Therefore its relevance is high.

3.2 Efficiency (Rating: ②)

3.2.1 Project Outputs

The project consists of 1) civil works and the procurement of equipment and 2) consulting services.

The outline of each item is as follows.

(1) Civil works and the procurement of equipment (Map of the airport is shown below.)

a. Runway (2,500 m), taxiway, apron and so on: Implemented almost as planned. With regard to passenger loading aprons, those for large planes was increased from 2 to 3 while those for medium size planes were decreased from 4 to 1[8]. The total area space was increased.
b. Construction of a passenger terminal building and control tower: The passenger terminal building was expanded. The control tower, which was supposed to be a part of the passenger terminal building in the original design, became independent.
c. Airport security systems (radio and navigation aids, airfield lighting and so on): Implemented as planned.
d. Other facilities (e.g., access roads): Access roads were constructed as planned but gutters were added. Aviation fuel facility was cancelled from the scope[9].

(See the Appendix for details).

[7] Source: Iloilo airport office
[8] Forecast of demand for the air transport changed after D/D. In other words, at the time of detailed design airline companies planned to use bigger planes more as compared with the appraisal time.
[9] Hydrant system was expected as the method of fuel supply to aircraft but it became possible to change the method to so called "Refyura" method based on the revised forecast of fuel consumption. In that case a private company (Petron) instead of the airport itself was able to install fuel supply facilities.

In total, eight items out of 21 were changed in detailed specifications. However, these changes were mostly increases in the capacity of facilities, equipment and space. They were necessary for full realization of the functions of the airport and all contribute to the project purpose.

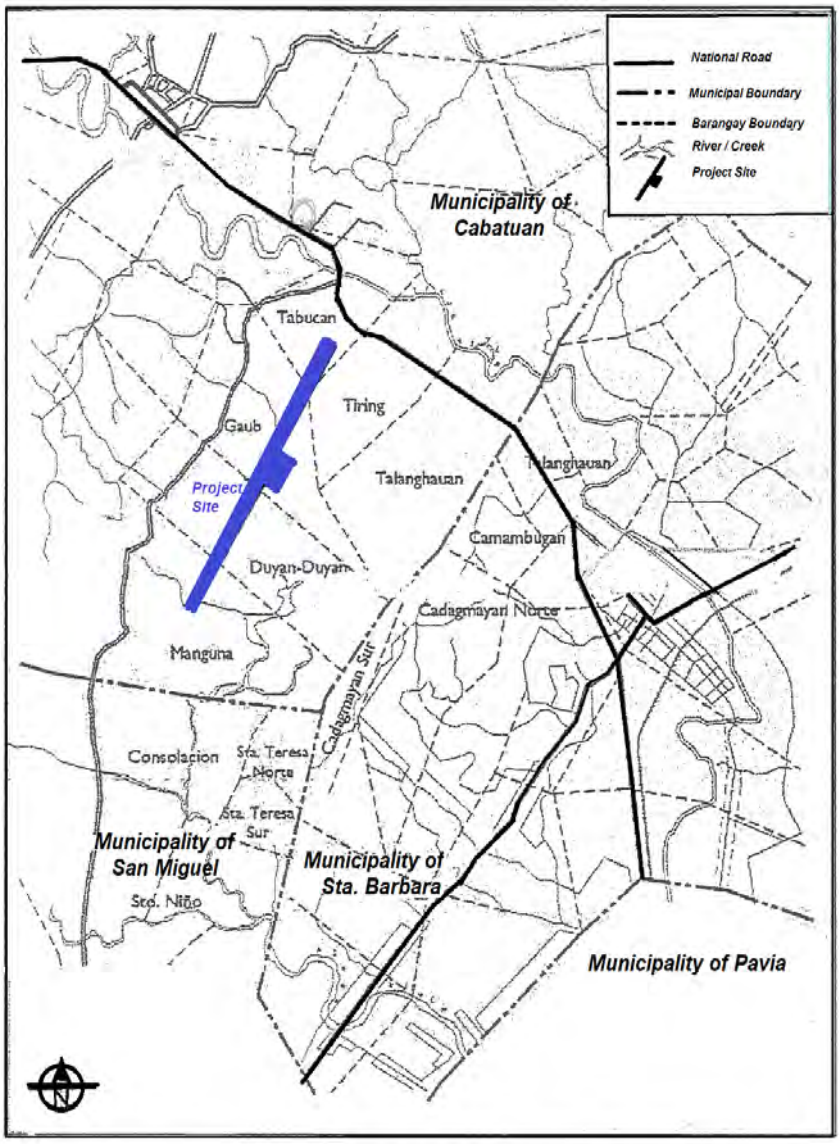

Figure 1: Map of New Iloilo Airport

(2) Consulting services

The following tasks were conducted exactly as they were laid out in the original plans.

- Detailed design, support for bidding, construction supervision and environment management

The implementing agency highly evaluated the consultants.

The following are the results of the questionnaire to the implementing agency concerning the Special Yen Loan.

- It is true that the enterprises' opportunities to bid for the project decreased because of the conditions of the Special Yen Loan. However, the number of participating companies in the Pre Qualification (P/Q) did not decrease much. The contract price did not increase much compared to ordinary bidding, either.
- In consideration of the long-term operation and maintenance of the facilities and equipment, it may be more efficient to procure equipment in the Philippines, as there is no need to import Japanese products. Accordingly, it was requested to allow more local procurement of equipment[10].

3.2.2 Project Inputs

3.2.2.1 Project Cost (Sub rating: ②)

The originally planned figures for the project cost were 8.352 billion yen in foreign currency and 3.204 billion Philippine peso in local currency (= 8.97 billion yen[11]), totaling 17.322 billion yen. Out of this, 14.724 billion yen was expected to be funded by the yen loan and the remaining 2.598 billion yen was supposed be shouldered by the Philippine government.

The actual figures of the project cost were 10.286 billion yen in foreign currency and 2.829 billion peso in local currency (= 7.469 billion yen[12]), totaling 17.755 billion yen. Out of this, 14.322 billion was funded by the yen loan and the remaining 3.433 billion yen was shouldered by the Philippine government.

In yen terms, the ratio of the actual project costs to the planned costs is 102.5%, which is slightly higher than planned.

Table 1: Comparison of project costs between Plan and Actual

Unit: million yen

Item	Original Plan（Appraisal）			Actual		
	Foreign currency	Local currency	Total	Foreign currency	Local currency	Total
Civil works and construction	6,436	5,516	11,952	9,164	4,098	13,262
Price escalation	272	234	506			
Physical Contingency	671	575	1,246			
Consulting service	973	265	1,238	1,121	340	1,461
Land acquisition and compensation	0	1,680	1,680	0	583	583
Administrative Cost	0	41	41	0	161	161
Tax	0	659	659	0	2,287	2,287
Total	8,352	8,970	17,322	10,286	7,469	17,755

Note: Exchange Rate: Peso 1=¥2.8 in the original plan and P1= ¥ 2.64 in actual

[10] There was a case where a Japanese manufacturer had to be invited from Japan for the replacement of parts of fire engines.
[11] Exchange rate: 1 Peso = 2.8 yen
[12] Exchange rate: 1 Peso = 2.64 yen

As shown in the above table, there is not much difference between the total planned cost and the result (actual). When we look at individual items, land acquisition and compensation decreased from 1,680 million yen to 583 million yen[13]. The actual cost of civil works and construction is almost same as the plan. The actual cost of consulting service is slightly higher than plan because of increase of MM.

As the aviation fuel facility was deleted from the original scope, it is necessary to modify the total planned project cost. The ratio of actual to plan, based on the modification, is 109.0%.

3.2.2.2 Project Period (Sub rating: ②)

Originally, the project had been planned to take four (4) years and eight (8) months from the signing of the Loan Agreement (L/A) in September 2000 to the completion of the civil works in April 2005. However, although the L/A was signed in August 2000, the civil works ended in March 2007. That is to say, while the planned implementation period was four years and eight months, the actual implementation period was six (6) years and eight (8) months. The ratio of the actual project duration to the planned one was 142.9%, which is longer than planned.

The reasons for the delay are as follows. The delay was the result of prolonged activities such as the bidding for civil works which started in April, 2004[14] instead of November 2002. This was a delay of one year and six months. The construction period was also extended from 30 months to 36 months, as the delivery of excavated soil to the borrow pit and the start of civil works were affected by bad weather. It had been planned to include two rainy seasons in the implementation period. However, there were three rainy seasons in the actual implementation period as a result of the delay in bidding.

3.2.2.3 Consulting service

Below is a comparison of the MM of planned and actual consulting service.

Table 2: Planned and Actual MM of Consulting Services

Category	Original Plan	Contract	Actual	Change	Reasons for change
1. Foreign experts					
Project Manager	52	50	64.39	Increase	Extension of D/D caused by the review of M/P and F/S, extension of the period of support for bidding, the extension of construction supervision caused by the extension of the construction period
Other engineers and experts	250	225	293.83	Increase	
TOTAL	302	275	358.22		
2. Pilipino experts					

[13] The major factor of decrease of cost is the decrease of land purchase price by 40% from the originally expected price.
[14] As a result of the review of the feasibility study, the Air Transportation Office (ATO) requested a re-designing of the airport's construction from the security point of view. In addition, it took time for the Philippine side to examine the appropriateness of the qualifications of the bidding companies.

Deputy Project Manager	52	53	58.94	Small increase	Extension of the construction period
Other engineers and experts	301	323.5	389.60	Increase	
TOTAL	353	376.5	448.54		

Both project cost and project period exceeded the plan, therefore, the efficiency of the project is fair.

3.3 Effectiveness (Rating: ③)

3.3.1 Quantitative Effects

3.3.1.1 Results from Operation and Effect Indicators

The outcome of the project was identified as "to respond to the increase of passengers and the cargo demand and also to improve the safety of airline services." The planned and actual major operation and effect indicators are as follows.

Table 3: Planned and Actual Major Operation and Effect Indicators

Indicators	1997	2005 (Expected year for opening the airport)	2006	2007 (Actual year of the opening of the airport)	2008	2009	2010
Number of passengers (Unit: thousand) (Planned)	n.a.	988					1,222
Number of passengers (Actual)	694		866	1,005	1,071	1,331	1,570
Cargo volume (Unit: ton) (Planned)	n.a.	9,900					11,500
Cargo volume (Actual)*1	11,159		10,030	10,195	9,520	9,332	11,820
Number of aircraft takeoffs and landings (Planned)	n.a.	9,930					10,970
Number of aircraft takeoffs and landings (Actual)	7,000*2		9,178	10,446	12,116	16,380	15,902

Source: New Iloilo airport office
Note:
*1. Cargo is mostly personal luggage.
*2. Estimate

As shown in the table above, although the opening of the airport was delayed by about two years, the target indicators as of 2010 were completely achieved. The actual average annual growth rates of passengers, handled cargo and number of aircraft takeoffs and landings for the first five years are respectively, 15.9%, 5.0%, 14.8%, while the planned figures were 4.3%, 3.0%, 2.0%[15].

Official documents were not available for the number of accidents incurred in the airport site. However, according to the Area Manager[16], the airline companies' staff and police officers at the

[15] Forecast of air transport demand (=number of passengers and cargo volume) was made, based on the forecasted GDP (NEDA) of the period, 1999-2004. It is estimated that actual number of passengers and cargo volume exceeded the initial planned figures, as the growth rate of real GDP of the region highly exceeded the forecast.
[16] A CAAP staff member and the top administrator at the airport

airport, there were no accidents such as collisions of airplanes or traffic accidents in the airport site for the last three years up to the ex-post evaluation.

In addition, in terms of efficient traffic flow, it is noteworthy that the Department of Public Works and Highways (DPWH) constructed a 16-km access road from the airport to downtown concurrently in coordination with the DOTC. This was outside the scope of the project[17]. According to the project manager, because of this road, it is fair to say that the transport time from the airport to downtown in the rush hours was reduced from 90 minutes to 45 minutes. This construction of access road from the airport to downtown was very effective in realizing smooth traffic flow of people and goods.

3.3.1.2 Results of the Calculations of Internal Rates of Return (IRR)

Financial Internal Rate of Return (FIRR)

Table 4: Planned and actual FIRR

	At appraisal	At ex-post evaluation (Re-calculation)
FIRR	4.26%*1	Negative
（Assumptions）		
Project life	25 years	Same as left
Cost	Construction, O&M cost	
Benefit	Revenue from various services	

*1. The calculation method of the Implementation Program (IP) was applied, as there is no figure shown in the appraisal report.

Table 4 above compares the planned FIRR and the actual one. Actual FIRR at the ex-post evaluation is negative. This is because the scale of project cost is about 2 times as big as the one expected in IP, although the growth of passengers is bigger than expected. However, the actual project cost only slightly exceeds the amount of plan at the time of appraisal.

Economic Internal Rate of Return (EIRR)

Table 5: Planned and Actual EIRR

	At appraisal	At ex-post evaluation (Re-calculation)*3
EIRR	17.4%*1	Negative
(Assumptions)		
Project life	24 years*2	Same as left
Cost	Construction, O&M cost	
Benefit	Saving of passengers' travel time, recovery of tourism revenue and increase of air cargo	

*1. 14.4% is stated in the appraisal document but there is no remaining record of the calculation process. Accordingly, we used the figures of IP whose calculation background is clear.

[17] All the access roads mentioned elsewhere in the report are within the scope of the project.

*2. 30 years is stated in the appraisal document but we used the figures of the IP, as the calculation background is clear.
*3. The calculation method of IP was applied.

Table 5 above compares the planned EIRR and the actual one. Actual EIRR becomes negative because of the same reason as the case of FIRR.

3.3.2 Qualitative Effects

Those qualitative effects such as the improvement of security and convenience in air transport and the efficient distribution systems between Panay island and neighboring areas and Manila metropolitan area were identified in the appraisal documents. These effects were confirmed quantitatively to a certain degree in the previous section but qualitative information was also collected.

The following research results show that passengers are highly satisfied with the airport in general including the convenience of the airport and the airline staff members have raised few issues on the functioning of the airport.

The Iloilo office of the Department of Trade and Industries (DTI) confirmed the following effects of the new airport.

Previously, the only means of going to Davao from Iloilo was a weekly ferry service which took 39 hours and an expensive air route by way of Cebu. Now it is much more convenient to go to Davao because of the direct flight. Flights between Iloilo and Manila have also increased.

We also conducted supplementary interviews with other stakeholders in order to confirm the situation concerning the realization of the outcome, "to respond to the increase of passengers and cargo demands and also to improve the safety of airline services." The results are as follows.

Table 6: Beneficiary Survey - Passengers (75 Interviewees)[18]

Items	Replies (5-grade evaluation, 5 as best)					
	5	4	3	2	1	No replies
Overall comfort (Comparison with old Iloilo airport)	53	20	2	0	0	0
Necessary time for check-in (Comparison with old Iloilo airport)	18	17	38	1	0	1
Overall evaluation	44	28	3	0	0	0

As a whole, passenger evaluations regarding the convenience of the airport are high. As a point of improvement, however, six interviewees pointed out that the X-ray machines are out of order and they should be repaired.

According to airline staff, there are no particular problems with airport functions. However, the issue of x-ray machines was again raised.

According the implementing agency, the extension of the runway from 2,100 m to 2,500 m made possible not only the service of larger airplanes, but also better response to bad weather due to the synergy effect with having control facilities set up at the beginning and the end of the runway.

[18] As at the first site research in April 2011. The situation of X-ray machines improved slightly as at the second site research in June 2011. Details are in "3.5 Sustainability."

In light of the above, this project has largely achieved its objectives. Therefore, its effectiveness is high.

3.4 Impact

3.4.1 Intended Impacts

(1) Economic indicators

The originally expected impact was "sustainable economic and social development of Panay Island and neighboring regions." (There were no pre-set up indicators.)

Indicators related to economic activities and visitors collected at site research are shown in the following table. (We focused on Iloilo city and the province rather than entire Panay Island, as the project's direct influence will be bigger in the area.)

Although it is difficult to verify the cause-effect relationship quantitatively, when we combine the following indicators and the results of the interviews with the LGU (Local Government Unit) and governmental agencies, the project seems to have provided some positive impact on the economy of Iloilo city and province.

Table 7: Economic Indicators of Iloilo City and Province

Indicators	2003	2004	2005	2006	2007 **(Airport opened in June)**	2008	2009
Iloilo city*1							
-Number of new business establishment	1,182	1,521	1,235	1,084	1,749	1,072	2,034
-Total capitalization of new business （million peso）	365.5	852.2	399.1	319.3	823.3	335.7	571.3
-Number of renewed business establishments	n.a.	n.a.	n.a.	8,678	7,545	n.a.	10,287
-Total capitalization of renewed business （million peso）	n.a.	n.a.	n.a.	34,855.6	38,965.9	n.a.	14,585.9
Iloilo province*2							
-No. of establishment (Business name registration)	n.a.	n.a.	3,942	3,884	3,730	n.a.	5,337
-No. of workers	n.a.	n.a.	15,562	14,032	16,535	n.a.	14,760
-Investment （million peso）	n.a.	n.a.	1,149.0	1,879.3	2,894.8	n.a.	1,191.3
Visitors to Iloilo city and province*3	214,690	336,854	380,289	372,778	417,689	396,134	394,277

(Source)

*1. Iloilo Socio-economic profile

*2. DTI Iloilo office

*3. Department of Tourism, Region VI office

When we look at the trend of each indicator, figures are increasing towards 2009 in general. In particular, most of the figures in 2009 clearly exceed those in 2006 before the airport opening. Increase of numbers such as number of new business and renewed business establishments means the scale of economy is expanding as a whole.

Although not all the above improvement in indicators are attributed to the airport construction, as verified by the following results of the interview to DTI, Iloilo (the following paragraph and APPENDIX 1.), and the project did contribute to investments in enterprises. Table 7 does not show a constant increase in visitors after the project, but the number of passengers increasing every year as shown in "effectiveness". Therefore, the new airport must have contributed to the increase of tourists.

(2) Impact confirmed in interviews

When we summarize the following interview results, the project provided the surrounding area with an economically positive impact according to LGU, governmental agencies and enterprises. However, some of the residents living near the airport and people who were relocated have had strong complaints about the compensation regarding land acquisition and relocation.

1. The summary of the interviews with three LGUs (municipalities) is as follows. (Please see APPENDIX 1 for the details.)

(Positive impact)

- Registered enterprises increased from about 500 to 1,110 after the construction of the new airport. This has increased employment in and outside the airport. Commercial facilities have also increased. (Cabatuan[19])
- After the opening of the international standard airport, many foreigners have visited. Housing development is observed around the airport and factories and furniture shops have opened along the road leading to the airport. (Santa Barbara[20])
- Small- and medium-sized enterprises have constructed various facilities. Employment is estimated to have increased in and outside the airport. (San Miguel[21])

(Negative impact)

- None of the three municipalities received complaints on air pollution or noise from the residents. In San Miguel, however, flooding started to occur after the airport construction because of changes in the local topography. The DOTC spent about 2 million pesos[22] to construct a soil drainage system to solve the issue. There has been no flooding since then.

2. Here is the summary of the interview with the Iloilo office of the DTI. (See APPENDIX 1 for the details.)

- Many enterprises have been established and investment activities are being conducted.
- Tourists, including businessmen, have increased and the number of hotels is increasing.

[19] Population is 55,394 in 2010.
[20] Population is 54,998 in 2009.
[21] Population is 23,804 in 2007.
[22] About 3.6 million yen at the exchange rate in September, 2011

3. According to the interview with the local big cooperative of taxi companies (38 member companies, whose share in Iloilo City is more than 50%), as beneficiary, after the opening of the new airport, the number of customers has increased and revenue of both car owners and drivers has increased. The revenue of owners is estimated to have increased about 10%.

4. The summary of the interviews with the residents who live near the airport is as follows. (Samples were collected from every direction surrounding the airport and the total was 67.) Negative opinions about the airport are relatively few. Some of the residents complained about the loss of income generating measures because of the government's land acquisition. (See APPENDIX 1. for the details.)

3.4.2 Other Impacts

(1) Impacts on the natural environment

The following measures were conducted by the implementing agency. There seems to be no particular problems, as no serious problems were raised during the interviews with the LGUs and residents. However, the LGUs and some residents suspect that the gutters constructed as a countermeasure against flooding during rainy seasons may not be sufficient.

With regard to the construction of the airport, an Environment Impact Assessment (EIA) was conducted and an Environment Clearance Certificate (ECC) was issued by DENR. The project was implemented in accordance with ECC[23].

An Initial Environmental Examination (IEE) on the access road was conducted as planned[24]. The DENR reviewed the results of the IEE and judged that the access road would not have any serious influence on the environment, if proper measures are taken. The DENR amended the ECC including this issue in July 2003, and the implementing agency conducted the following measures.

- Installment of a dust barrier along the access road
- Daily sprinkling of water on the road
- Installment of gutters as a countermeasure against occasional flooding

In addition, based on the MOA[25] signed with the DENR, a Multi-Party Monitoring Team (MMT)[26] was organized and an Environmental Guarantee Fund (EGF) was established for the indemnification of damages caused by the project, and an Environmental Monitoring Fund (EMF) was set up to cover the expenses of the environment monitoring activities[27].

The MMT's activities include the following:

---

[23] Examples of measures are construction of adequate drainage facilities, construction of adequate sewage treatment facilities, proper handling, collection/storage and disposal of oil/lubricants and other waste.

[24] At the time of the EIA, the location of access road had not been decided and the access road was outside the scope of the EIA and the ECC. Later on, the location of access road was decided and then an IEE which was smaller than the ECC was expected to be conducted in order to obtain an ECC.

[25] Minutes of Agreement

[26] Member organizations are DENR Regional Office, DOTC, Iloilo provincial government, Cabatuan and Sta. Barbara municipalities and so on.

[27] DOTC provided the funds. Payment to EGF and EMF was about 2.6 million peso and about 1.2 million peso, respectively.

- Environmental monitoring[28]
- Responding to the series of complaints such as damage to crops and flooding
- Rehabilitation of drainage as a countermeasure against flood
- Installation of additional traffic signage

(2) Land Acquisition and Resettlement

The results of the compensation to the affected people are summarized as follows.

Table 8: Results of Compensation to the Affected People

Category	Households	Compensation
Land owners	215	Payment of 65 pesos per 1m^2 of the land to give up
Tenants*1	138	Five times the average of the gross harvest of the land holding during the five preceding years
Informal settlers (Squatters)	99	If regarded as a "relocatee," they are eligible for the compensation to relocatees as stated below.
Farm workers*2	Not documented	If regarded as a "relocatee," they are eligible for the compensation to relocatees as stated below.
Total	452	
Relocatees*3	99	・Cash compensation for houses ・Compensation for the loss of work in the form of business livelihood and skills training ・ Provision of 110 m^2 of land per household ・ Provision of a housing loan program without interest by the National Housing Authority ・Provision of food, clothing and transport services during the relocation activities

*1. They are mostly farmers and there is an official agreement of land rental with the owners. They have a complete right to use the land.
*2. It is not necessary to have a formal rental agreement with the owners and they pay to the owners by harvest.
*3. People whose houses are affected by the construction are regarded as "relocatee" regardless of the above mentioned category. In reality, most of the informal settlers were relocatees.

190.63 ha of land including 259 sections were purchased by the DOTC[29]. 2.86 ha out of the 190.63 ha were for the relocated people. A Community Assistance Program (CAP) was formulated in March 2002 in order to carry out DOTC's social responsibility to the project affected people and communities. According to the "Community Assistance Program (Narrative Report)" formulated by the Project Management Unit in May 2007 and also by interviews during the ex-post evaluation, the results of the implemented CAP are summarized as follows.

[28] Currently, the new Iloilo Airport submits an ECC monitoring report to DENR quarterly in line with the ECC.
[29] According to the "Project Status Report" dated June 28, 2008

Table 9: Budget and results of implemented programs of the CAP

Unit: million Pesos

Items	Budget allocation*	Results
1. Relocation site development program	23.0	23.0
2. Livelihood/skills training program	3.5	2.5
3. Disturbance compensation to tenants	30.5	38.1
4. Capacity building program	3.2	3.3
5. Management and monitoring	1.9	
6. LGU development	4.0	4.0
Total	66.1	70.9

*Note: These are stated in the "Community Assistance Program (Narrative Report)" issued in May 2007. They are revised from the original budget (March, 2002). The original budget was 65 million peso.

The CAP's actual activity items are similar to the original plan. The results of expenditures exceed the budget allocation.

The results of each program are as follows.

1) Relocation site development program

Resettlement Management Committee (RMC) is a main actor of the program. 2.86 ha of land was purchased at Banguit barangay, Cabatuan City, Iloilo province. Based on the site inspection, 99 households were approved as eligible relocatees. Land development was already completed and administration was already turned over to LGU-Cabatuan from DOTC. Land acquisition started in 2002 and relocation was completed in 2006[30]. Land acquisition and relocation were conducted in line with the Philippine's domestic law[31].

The summary of the interviews with the 10 relocatees (different households) is as follows.

In general, dissatisfaction on the negotiation process during the implementation of the relocation and on the compensation amount is strong. Complaints on the loss of income generating measures are also strong. Compensation was conducted according to the rule of the Philippine government (law), there is some remaining complaint among relocatees.

Items	Replies
Are you satisfied with the relocation negotiation process?	Very much: 0; To a certain degree: 0; Not very much: 4; Not satisfied at all: 6
Are you satisfied with content of the compensation?	Very much: 0; To a certain degree: 0; Not very much: 2; Not satisfied at all: 8
Are you satisfied with the vocational training provided?	Excellent: 0; Good: 3; Neutral: 2; Poor: 3; Very Poor: 2
Free opinion about the project	There were certain replies regarding complaints about the loss of income generating measures and requests for an improvement of the situation.

[30] At the very early stages of project implementation, the management policy on the affected people had not clearly been decided. Accordingly, people resorted to demonstrations voicing their demands. To this situation, the RMC was organized and it acted for the land acquisition. The activity of RMC made it possible to provide housing loan without interest.

[31] Based on RA 8974 "An act to facilitate the Acquisition of Right-of-Way, Site or Location for National Government Infrastructures and for other purpose"

2) Livelihood/skills training program

An external professional agency conducted training at the request of DOTC. Based on the training needs assessment, a total of 11 training courses such as retail store management, swine and poultry raising, restaurant management were conducted for residents affected by the project for 15 days in October, 2004. There is no record of the trainees' satisfaction survey. Some residents seem to be employed at the new airport, but details are not known.

3) Disturbance compensation to tenants

The program was implemented by DOTC. About 38 million pesos were paid as compensation for 177 lots (156.92 ha) out of 188 tenanted lots (165.03)[32].

4) Capacity building program

Organization of communities and various training activities such as leader training, gender and development, adult literacy education, skills training and cooperative formation were conducted by PMO. As a result, the NIAPAPA[33] (Multi-Purpose and Transport Service Cooperative) was formulated and is conducting some commercial activity on the 3rd floor of the passenger terminal building. The cooperative transports passengers between the airport and the city, using several vans.

5) Management and monitoring

This activity is to monitor the implementation of the CAP activities by the PMO. Progress reports were made monthly and biannually, holding a coordination committee with stakeholders.

6) LGU development

This program was designed to help both the municipalities of Cabatuan and Santa Barbara address changes brought by the presence of the new airport. Both municipalities' proposals on upgrading the information and communication system were accepted by the DOTC. At the time of the ex-post evaluation, Santa Barbara had already implemented the system, while Cabatuan was procuring the system.

As stated above, comprehensive measures were conducted such as communication with relocatees and the provision of a compensation program (compensation for housing, compensation for the loss of work). However, considering the degree of satisfaction of relocatees, it is difficult to conclude the program was conducted successfully.

According to the interviews with relocatees, they are not completely satisfied with the relocation process and the compensation amount[34]. With regard to the compensation, the implementing agency

[32] Out of the remaining 11 lots, 8 sections are waiting for decision by DARAB (Department of Agrarian Reform Arbitration Board) and 3 sections are waiting for DOTC's payment.
[33] New Iloilo Airport Project-Affected People's Association
[34] Please see "summary of the interviews with the 10 relocatees" in 3.4.2 Other impacts, 2) Land Acquisition and

made certain rational price formulations in accordance with the law[35] and we cannot conclude that the compensation amount was not sufficient simply because of the relocatees' complaint. With regard to the relocation process, however, they did not feel the explanation was sufficient[36] and it was better to conduct elaborate negotiations and explanations with residents at the planning stage or early stages of relocation. With regard to the considerable amount of training that was conducted, such pieces of information as the trainees' evaluations do not remain in the PMO. As this kind of information is very useful to future projects, they should be kept carefully.

Furthermore, during the process of negotiation between the implementing agency and the relocatees, it seemed that employment of those relocatees at the new airport and even some figure (number of recruited people) were mentioned but it was not realized substantially, which also remains a reason for the dissatisfaction of the relocatees. If any figure of employment was mentioned, relocatees may have accepted it as a "promise," not as a target. Therefore, at the relocation negotiation, the project side should be very careful not to inflate the affected people's expectations.

In summary, the originally expected impact was well realized. However, the fact that some residents around the airport, particularly relocatees, have strong complaints is one of the very few problems of the project.

3.5 Sustainability (Rating: ③)

3.5.1 Structural Aspects of Operation and Maintenance

In regards to the organization of airport responsibilities, each post and its responsibility are clearly defined and there seems to be no serious problem.

The implementing agency of the project is the DOTC. At the time of the appraisal, operation and maintenance of the new Iloilo Airport was expected to be managed by the Air Transportation Office (ATO) belonging to the DOTC. Later on, however, the ATO was abolished and reorganized into the Civil Aviation Authority of the Philippines (CAAP) in March 2008. The CAAP is responsible for the management of airports in the Philippines and is financially independent. The CAAP was established in order to manage the entire airport sector in the Philippines more efficiently.

In the new Iloilo Airport, there are 241 staff members[37] allocated with an Area Manager as the top administrator (at the time of the second site research). Necessary qualifications such as academic degrees and licenses are stipulated according to major posts. Operation and maintenance are managed by a division called Aerodrome Operations Division and there are 139 staff members.

Airport management considers that the current staff size is almost appropriate and this size will be maintained.

Resettlement

[35] RA 8974 "An act to facilitate the Acquisition of Right-of-Way, Site or Location for National Government Infrastructures and for other purpose"

[36] Please see "summary of the interviews with the 10 relocatees" in 3.4.2 Other impacts, 2) Land Acquisition and Resettlement

[37] The breakdown is as follows: Permanent: 62; Casual: 29 (short term contract, max 6 months); and Job Order (more temporary than Casual): 150.

The following are considerations on the CAAP as a whole.

The following description about the CAAP was in last year's ex-post evaluation, "The Philippines: Selected Airports (Trunkline) Development Project (I) & (II)".

"With regard to the operation and maintenance, delays in the response to emergencies are a matter of concern. In order to make the O&M of the airports more reliable, it is necessary to strengthen the organization." If the above issue is attributed to the shortage of staff, then it is likely people including the CAAO HQ still feel that the staff size is not sufficient.[38]

Another statement from last year's ex-post evaluation reads as follows. *"One of the issues to be tackled for the CAAP in the field of operation and maintenance of the airports is to formulate an O&M manual for local airports. The formulation of such manual has been delayed."*

While interviewing for this issue, it was discovered that the above mentioned manual was not completed.

In conclusion, it seems necessary to strengthen the organization and promote human resource development for the entire CAAP as well.

3.5.2 Technical Aspects of Operation and Maintenance

There is no particular problem with the technical aspects.

Daily monitoring is conducted for power supply facilities, control tower and control systems, the water supply facility, waste water disposal facility and so on, based on the manuals made by the manufacturers of the facilities. With regard to elevators and escalators in the airport buildings, quarterly preventive maintenance is conducted and annual preventive maintenance is conducted for the Baggage Handling System, boarding bridges and the fire alarm system. Some necessary spare parts are imported for each facility.

There seems to be no particular problem in O&M, and the technical skills of the staff are also reasonable. It is regarded important, however, to maintain practical skills. Last year manuals for preventive maintenance were standardized and OJT is conducted quarterly for 15 staff members at one time (one day) for particular subjects.

3.5.3 Financial Aspects of Operation and Maintenance

According to the airport management, the current budget size for operation and maintenance is almost satisfactory and there seems to be no particular financial problem. The revenue of airport has been increasing steadily. As not all the airports under the CAAP are profitable, the Iloilo Airport supports the CAAP financially. CAAP has also recorded a surplus since the time when it became financially independent.

The airport itself is not financially independent and receives the necessary operational budget from the CAAP. The airport, however, earns a much higher revenue than its operational budget and the net profit is paid to the CAAP. In 2010, the ratio of its operational budget to revenue was only about 54%.

[38] For example, there is no new recruitment after the departure of retired staff.

The trend of revenue is shown below.

Unit: Million pesos

Year	Total revenue
2008	51.8
2009	180.6
2010	221.6

The trend of operational budget of the airport is shown below. Actual expenses (results) are bigger than original budget, receiving additional funds, based on the needs of the airport.

Unit: Million pesos

Year	Budget	Results
2008	45.6	65.9
2009	50.0	78.6
2010	62.9	119.1

According to the airport management, the budget size for the airport is almost sufficient.

The following table is the summary of the profit and loss statement for the entire CAAP. It is financially independent since establishment. The CAAP's revenue increased significantly in 2009 and the financial structure has improved over time.

Unit: Million pesos

Year / Item	2008	2009	2010
1. Current revenue	1,681	3,826	3,679
2. Current expenditures	1,322	2,421	2,385
3. Profit and loss	360	1,405	1,294
4. Other revenue and expenditures*	584*	-164	-72
5. Net profit and loss	943	1,241	1,221

* Note: + means net revenue and – means net expenditure. Government subsidies were provided each year as follows: 2008: 583.1; 2009: 0.6; and 2010: 0.6 (Million pesos)

3.5.4 Current Status of Operation and Maintenance

There are no serious problems in operation and maintenance in general. However, the non-performing X-ray machines should be replaced as stated below, as it is related to the security of the entire airport.

According to the airport management, most of the facilities and equipment are operational without problems. A very small part of some equipment has problems but parts will be replaced as soon as the funds come.

As of April 2011, there were six X-ray machines for security checks and five of them were out of

order and airport staff conducted manual security checks[39]. Later on, two machines were replaced. As of June 2011, the remaining three out-of-order machines were to be replaced one after another, as soon as the budget would come.

Airport security is usually managed by the Office of Transport Security (OTS). However, in the project, X-ray machines were procured by the project funds. After the current replacement, responsibility for the maintenance of X-ray machines including future renewal of equipment will be returned to the OTS.

In conclusion, no major problems have been observed in terms of organization, technology and finance, therefore sustainability of the effect realized by the project is high.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project aims to respond to the increase in passengers and cargo demand and also to improve the safety of airline service by constructing a new airport in the suburbs of Ilopilo city in Iloilo province. The project suits the development policies and needs of the Philippines and also the Japanese government's aid policies. Accordingly, the relevance is high. Aircraft landings and takeoffs, cargo volume and the numbers of passengers are growing steadily and passengers' satisfaction is high, which means high effectiveness. The impact on the local economy in terms of the increase of enterprises and commercial facilities has appeared.

However, as the implementation period was prolonged and the project cost slightly exceeded the plan, the project's efficiency is fair. No major problems have been observed in terms of organization, technology and finance, therefore sustainability of the effect realized by the project is high.

In light of the above, this project is evaluated to be highly satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

(1) Complete repair or replacement of the non-operating X-ray machines

As stated in the section on sustainability, the airport has six X-ray machines for security checks and three are out of order. Thus the airport staff conducts manual security checks. As manual security checks are not ideal for screening carry-on or checked-in baggage brought by passengers, the airport should either replace or repair the equipment shortly. It is also necessary for OTS to make sure that the equipment is used in a stable condition in future.

4.2.2 Recommendations to JICA

None

[39] The major reason of disorder is the use of equipment for long hours.

4.3 Lessons Learned

(1) Coordination with related agencies

The construction of the new airport accelerated the flow of people and goods from other regions in the Philippines. In terms of the efficient flow of people and goods, it is noteworthy that the access road from the airport to downtown (16 km, outside the scope of the project) was constructed in a timely manner by the DPWH in coordination with the DOTC. This is a significant practice. When constructing an airport in the future, it is recommended to construct or improve the necessary roads around the airport as well in coordination between CAAP and DPWH, as a good practice, considering the traffic situation around the airport.

(2) Conducting elaborate negotiations and explanations for the local residents at the early stages of the relocation process

According to the interview with relocatees, they are not completely satisfied with the relocation process or the compensation amount. With regard to the relocation process, it was better to conduct elaborate negotiations and explanations with the residents at the planning stage or the early stages of relocation.

Furthermore, during the process of negotiations between the implementing agency and the relocatees, it seems that the employment of the relocatees at the new airport was mentioned but it was not realized substantially, which also remains a reason for the dissatisfaction of the relocatees. Therefore, in the future, during relocation negotiations, the project side should be very careful not to inflate the affected people's expectations.

(3) Vocational training as a compensation method

In the project, one item of the compensation package for the relocatees was to provide them with vocational training as a form of compensation for the loss of income generating measures based on farming. While it is agreeable to conduct such training rather than simply giving cash in order to make relocatees self-sustainable, it causes dissatisfaction with the relocatees when they actually cannot obtain an alternative income generating opportunity. The implementing agency should formulate a vocational training program which is as practical as possible, considering the situation of the people and their location, in order to increase employment after training.

With regard to the considerable amount of training, such pieces of information as the trainees' evaluations did not remain in the PMO. As this kind of information is very useful to future projects in which large-scale relocation of residents and measures to support relocates are necessary, such information should be kept carefully by PMO. It is also better to conduct follow-up research, such as a training effect assessment, at a certain time after the project has finished. The implementing agency or LGU should be responsible for that.

Comparison of the Original and Actual Scope of the Project

Item	Original	Actual
1.Project Outputs		
1) Runway - Length - Width - Shoulder width	2,500m 45m 7.5m	same
2) Taxiway - System - Width - Shoulder width	Two Stub Taxiways 23m 7.5m	same
3) Passenger Loading Apron	A330: 2 SJ: 3 TP: 1 Total Area: 40,300 m^2	A330: 3 SJ / TP: 1 Total Area: 48,000 m^2
4) Passenger Terminal Building	9,000m^2、 2 boarding bridges	12,000m^2 、 3 boarding bridges
5) Cargo Terminal Building - Cargo Warehouse - Offices - Total	 900m^2 400m^2 1,300m^2	same
6) Administration building (including control tower)	2,000m^2	Administration building: 950m^2 Control Tower: 1,700m^2
7) Airport security system	Radio, navigation aids, airfield lighting and so on	same
8) Other facilities	Access roads and others	Almost same as plan except for aviation fuel facility which was deleted
2.Project Period	September, 2000 – April, 2005 （56 months）	August, 2000 – March, 2007 （80 months）
3.Project cost Amount paid in Foreign currency Amount paid in Local currency Total Japanese ODA loan portion Exchange rate	 8,352 million yen 8,970 million yen （3,204 million peso） 17,322 million yen 14,724million yen 1 peso＝ 2.8 yen （As of January, 2000）	 10,286 million yen 7,469 million yen （2,829 million peso） 17,755 million yen 14,322 million yen 1 peso＝ 2.64 yen （Weighted average）

APPENDIX 1. Details of survey on the impact of project

1. Interviews to 3 LGUs (municipalities) surrounding the airport were summarized as follows.

LGU (Population)	Interviewees	Major items of impact
Cabatuan (55,394) *1	City planning and development Dept.	Increase of registered enterprises is mentioned as positive impact. After the construction of the new airport the number of registered enterprises increased from 500 to 1,110. This is estimated to have increased employment in and outside the airport. Commercial facilities also increased around the airport. Eventually the revenue of LGU increased. Citizens are proud of the existence of fine airport. With regard to negative impact, there is no complaint about environment from residents. Noise may be also acceptable, too. We cannot think of any other negative impact. The overall evaluation of the project is Excellent (top of 5 grade evaluation).
Sta. Barbara (54,998)*2	Director, Administration Dept.	The following items can be mentioned as positive impact. - Morale of residents and business persons increased because of the construction of the airport of international standard. - More foreigners visit than before. They are both tourists and business persons. - Residential area of high grade was developed around the airport. - Commercial activities such as factories and furniture shops are observed along the road near the airport. - The prices of real estate are gradually increasing. With regard to negative impact, there is no complaint about environment from residents. We cannot think of any other negative impact. The overall evaluation of the project is Excellent (top of 5 grade evaluation).
San Miguel (23,804)*3	City planning and development Dept.	We can mention that economy is more active as positive impact. Concrete items are as follows. - Small and medium size enterprises started to construct various kinds of facilities such as factories, warehouses, and sightseeing facilities. - Although there is no accurate statistics, the employment in and outside the airport may be increasing. - Governmental offices are transferred here. With regard to negative impact, there is no complaint about environment such as air pollution and noise from residents. Flood occasionally happens after the airport construction because of the change in topography. DOTC spent about 2 million peso to make drainage facilities as a counter measure and there is no flood since then. But there is worry that this measure may not be enough and there is a future possibility of flood at the time of typhoons. The overall evaluation of the project is Excellent (top of 5 grade evaluation).

Note: *1. as at 2010, *2. as at 2009, *3. as at 2007

2. The results of interview to DTI, Iloilo office are summarized as follows. (The content of "effect" rather than "impact" is included.)

- The new airport has contributed to local economy in many senses.
- Many enterprises were established, investment increases and the economy is growing. *

- Movement of people is very active including business persons.
- There was only a weekly ferry service taking 39 hours and an expensive air route by way of Cebu, in order to go to Davao from Iloilo previously. Now it is much more convenient to go to Davao because of the direct flight. Flights between Iloilo and Manila also increased.
- Zest Air started service as a new comer and its airfare is cheaper than others.
- Tourists increased and hotels, too.

*There are many factors behind the economic growth as follows. The following investment promotion is, however, also conducted with opening of the new airport as central material.

- Construction of ICT centers (during 2007 and 2008 after the opening of the new airport more than one ICT centers were constructed.)
- Investment promotion by Iloilo government (Iloilo Economic Foundation)
- Investment promotional measures by LGU such as tax benefit
- Supply of rich human resources by universities and colleges

3. The summary of residents near the airport is as follows. (Samples are collected from every direction from the airport and the total is 67.) Negative opinion about the airport is relatively few but part of residents complained about the loss of income generating measures because of government's land acquisition.

Items	Replies
Have you received benefit from the airport?	Yes：27、No：35、No replies：5
Was your property affected?	Yes：38、No：16、No replies：13
Was your land purchased by the government?	Yes：22、No：15、No replies：30
Are you satisfied with the purchase price?	Very much：0、To a certain degree：0、Not very much:17、Not satisfied at all：22、No replies：28
Impact on environment	Regarding the influence on air, noise, water quality, vegetation and animals, about half of the interviewees replied "No change". On air there are slightly more "improved" than "worse". Regarding noise, water quality, vegetation and animals, "worse" is slightly more than "improved".
Overall evaluation	Excellent：11、Good：32、Neutral：10、Poor：6、Very poor：6、No replies: 2 Note: As the reasons of "Very poor", issues of flood at rainy seasons and loss of income generating measures are raised.