

Ex-Post Project Evaluation 2013: Package III-1 (the Philippines)

December 2014

JAPAN INTERNATIONAL COOPERATION AGENCY

**Mitsubishi UFJ Research & Consulting Co., Ltd.
Octavia Japan Co., Ltd.**

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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 2011, and Technical Cooperation projects and Grant Aid projects, most of which project cost exceeds 1 billion JPY, that were mainly completed in fiscal year 2010. 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 2014
Toshitsugu Uesawa
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.

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Republic of the Philippines

Ex-Post Evaluation of Japanese ODA Loan
“Rural Road Network Development Project (Phase III)”

External Evaluator: Masumi Shimamura
Mitsubishi UFJ Research and Consulting Co., Ltd.

0. Summary

This project improved national secondary roads with the aim of securing safe and efficient transport on the rural road network in the surrounding areas. The project objective – to ensure safe and efficient transport by enhancing quality of the rural road, thereby contributing to the development of the local economies and to redress the economic disparity between rural and urban areas – is consistent with the development policy of the Philippines and with the development needs both at the time of the appraisal and ex-post evaluation, as well as Japan’s ODA policy at the time of appraisal; thus, the relevance of the project is high. Annual average daily traffic far exceeded the target and vehicle operating cost was reduced significantly after the completion of the targeted road sections. In addition, the results of interview and beneficiary survey in the field have shown local residents’ satisfaction with the benefit of the project (improvement of certainty/reliability of road network, enhancement of market access, and promotion of transport efficiency). Furthermore, the project is also contributing to the increase of income of local residents and activation of local economic activities; thus, the project’s effectiveness and impact are high. On the other hand, the project cost exceeded the plan and the project period was significantly longer than planned; thus, efficiency is low. As regards operation and maintenance, old heavy machineries and vehicles have not been replaced adequately due to insufficient budget; thus, sustainability of the project is fair.

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

1. Project Description



Project Location

(11 Road Sections Across the Country:
Indicated in Red Dots)



Maayon-Cuartero-Jct. Iloilo/Capiz Road
(Panay Island, Capiz Province)

1.1 Background

Roads are the most widely used means of transportation in the Philippines, accounting for about 90% of total passenger travel and 50% of freight traffic volume at the time of appraisal (2001). The national road system was relatively well developed in terms of kilometers covered by the network, but the majority of them were not paved. Also, there was a large gap between development status of arterial roads and secondary roads (national roads which connect arterial roads and municipalities). During the rainy season, some of the unpaved sections deteriorated so much that they were impassable. In addition, Bailey bridges¹ were being used. In sum, rural areas hardly had a safe and efficient road network. Previous road development projects focused primarily on improving the network of national arterial roads, and national secondary roads, for which this project was designed – upgrading unpaved roads, replacing Bailey bridges to permanent bridges – had not been undertaken adequately. Thus urgent steps were required to improve the quality of the country's rural road network.

1.2 Project Outline

The objective of the project is to ensure safe and efficient transport on the rural road network serving the adjacent areas by upgrading the eleven segments of national secondary roads and strategic roads across the country, thereby contributing to the development of the local economies and to redress the economic disparity between rural and urban areas.

¹ Temporary bridges constructed in a short time in order to secure passage in the immediate future.

Loan Approved Amount/ Disbursed Amount	6,205 million yen / 4,540 million yen
Exchange of Notes Date/ Loan Agreement Signing Date	March, 2001 / May, 2001
Terms and Conditions	<p>【Main Construction】 Interest Rate: 2.2%, Repayment Period: 30 years (Grace Period: 10 years), Condition for Procurement: General Untied</p> <p>【Consulting Service】 Interest Rate: 0.75%, Repayment Period: 40 years (Grace Period: 10 years), Condition for Procurement: Bilateral Tide</p>
Borrower / Executing Agency	The Government of the Philippines / The Department of Public Works and Highways (DPWH)
Final Disbursement Date	March, 2012
Main Contractor (Over 1 billion yen)	Sammi Construction Company, Ltd.(Korea), J.M.Luciano Construction Inc. (the Philippines), China Wuyi Co., Ltd. (China)
Main Consultant (Over 100 million yen)	Katahira & Engineers International (Japan) / Proconsult, Inc. (the Philippines) / Techniks Group Corp. (the Philippines) / Development Engineering and Management Corp, Techphil Inc. (the Philippines) / United Technologies (the Philippines) / Multi-Infrakonsult, Inc. (the Philippines) (JV)
Feasibility Studies, etc.	<ul style="list-style-type: none"> • JICA F/S on Rural Road Network Development Project (February, 1989) • JICA F/S on Rural Road Network Development Project (II) (October, 1990) • JICA SAPROF (Special Assistance for Project Formation) (October, 1991) • DPWH Pre-F/S (May, 1997)
Related Projects	<p>Japanese ODA Loan (Loan Agreement signing year and month in parentheses)</p> <ul style="list-style-type: none"> • Rural Road Network Development Project (I) (July, 1991)

	<ul style="list-style-type: none"> • Rural Road Network Development Project (II) (August, 1995) • Urgent Bridges Construction Project for Rural Development (March, 2002) • Road Upgrading and Preservation Project (March, 2011) <p>Technical Cooperation</p> <ul style="list-style-type: none"> • Improvement of Quality Management for Highway and Bridge Construction and Maintenance (Phase I: February, 2007 - February 2010, Phase II: October, 2011 - September, 2014) <p>Grant Aid</p> <ul style="list-style-type: none"> • Project for Constructing Bridges Along Rural Roads (Exchange of Notes signing year and month in parentheses) <p>Phase 1 (April, 1988)</p> <p>Phase 2 (October, 1988)</p> <p>Phase 3 (April, 1990 and February, 1992)</p> <p>Phase 4 (January, 1993 and July, 1993)</p> <p>World Bank</p> <ul style="list-style-type: none"> • National Roads Improvement and Management Program Phase 2 (NRIMP 2) <p>Asian Development Bank</p> <ul style="list-style-type: none"> • Road Improvement and Institutional Development Project
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2. Outline of the Evaluation Study

2.1 External Evaluator

Masumi Shimamura, Mitsubishi UFJ Research and Consulting Co., Ltd.

2.2 Duration of Evaluation Study

Duration of the Study: November, 2013 – December, 2014

Duration of the Field Study: March 16–April 14, 2014, June 25–July 9, 2014

3. Results of the Evaluation (Overall Rating: C²)

3.1 Relevance (Rating: ③³)

3.1.1 Relevance to the Development Plan of the Philippines

At the time of appraisal, the “New-Medium Term Development Plan (1999-2004)”, formulated under the Estrada Administration, stated one of its development goals to support the socioeconomic development of the Philippines by providing safe and reliable transportation service, with one of its strategies to achieve this included “enhancing the quality of existing infrastructure through appropriate renovation and maintenance management.” Based on this policy, the government set the target that entire national arterial roads should be paved by 2004 (71% paved as of 1998), and that 66% of national secondary roads should also be paved by 2004 (47% paved as of 1998). This project is targeted to improve national secondary roads, and is clearly indicated in the New-Medium Term Development Plan.

At the time of ex-post evaluation, the “Mid-Term Development Plan (2011-2016)” prioritized development of road and bridge infrastructures which reduce transportation cost and thereby activate economic activities. The Plan emphasized the maintenance of existing transport infrastructure and transport network, by prioritizing resource allocation including budget, personnel and equipments.

In addition, the Department of Public Works and Highways (hereinafter referred to as “DPWH”), the executing agency of the project, developed its “Mid-Term Development Plan (2011-2016)”, which highlighted the “strategic development of transport infrastructures as well as maintenance and management of transport infrastructures”. The Plan emphasized the maintenance and enhancement of existing road network, together with further network expansion, based on following priority.

1. Maintenance of existing transport infrastructures (roads and bridges)
2. Repair and rehabilitation of damaged portions
3. Widening and improvement of heavily trafficked sections
4. Development of new roads and missing links⁴

3.1.2 Relevance to the Development Needs of the Philippines

As mentioned in “1.1 Background”, at the time of appraisal, improving quality of the existing infrastructures through development of unpaved roads and replacement of Bailey bridges by permanent bridges was urgent necessity. However, development of national secondary roads was insufficient since previous road development projects focused

² A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

³ ③: High, ②: Fair, ①: Low

⁴ Unpaved road sections within the road network. Road sections where the network is interrupted.

primarily on improving the network of national arterial roads. Therefore, the government needed to develop rural road network by improving national secondary roads which connect arterial roads and municipalities, in parallel to the development of arterial road network. Through this, it was necessary to redress the economic disparity between rural and urban areas by activating rural economy.

At the time of ex-post evaluation, DPWH emphasized the importance of enhancing quality and capacity of existing road and bridge infrastructures, and set its numerical targets as follows to realize its goal.

- 97% of national arterial roads should be paved by 2016 (88% paved as of December, 2012)
- 88% of national secondary roads should be paved by 2016 (65% paved as of December, 2012)
- Entire national bridges along national roads should become permanent bridges by 2016

Thus, development of national secondary roads was placed an importance at the time of the project appraisal and it remains important at the time of ex-post evaluation. Therefore, the development needs concerning this project is clear.

3.1.3 Relevance to Japan's ODA Policy

In December 1999 Japan International Cooperation Agency (hereinafter referred to as "JICA") prepared the "Medium-Term Strategy for Overseas Economic Cooperation Operations" based on the Japan's assistance policy. In this document the following fields were listed as priorities: (1) "making economies more resilient while overcoming constraints in order to achieve sustainable growth"; (2) "poverty alleviation and correction of regional disparities"; (3) "environmental protection including disaster prevention as well as disaster prevention measures"; and (4) "human resource development and system building." Out of these priorities, the project corresponds to "(2) poverty alleviation and correction of regional disparities" which aimed at redressing the economic disparity between rural and urban areas through facilitating local economic development by securing safe and efficient road network.

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

3.2 Effectiveness⁵ (Rating: ③)

3.2.1 Quantitative Effects (Operation and Effect Indicators)

At the time of appraisal, following three operation and effect indicators were assumed: 1. annual average daily traffic, 2. vehicle operating cost savings, and 3. reduction of travel time. At the time of ex-post evaluation, actual data regarding indicator “1.” were available, however, data on indicator “2.” had to be regarded as reference since accurate before-after analysis cannot be conducted due to changes of calculation method. As regards indicator “3.”, qualitative analysis was undertaken based on the results from the local interview survey and beneficiary survey.

3.2.1.1 Annual Average Daily Traffic (vehicle/day)

Table 1 shows the baselines and targets concerning annual average daily traffic (hereinafter referred to as “AADT”) volume at the time of the project appraisal as well as the actual data at the time of ex-post evaluation (recent three years). It should be noted that completion month and year of each road section varies, and 1-5 years have already passed as of 2013, when all recent actual data were available. It can be observed that the actual AADT for all the developed road sections greatly exceed the targets set forth at the time of appraisal⁶, therefore, it can be regarded that the original goal has been achieved.⁷

Table 1: Annual Average Daily Traffic (AADT)

(Unit: vehicle/day)

Road Section / Province (Completion Month and Year)	Baseline	Target		Actual		
	2001	Completion Year	7 years after Completion	2011	2012	2013 (Note 1)
1.Batac-Jct. Banna (Espiritu)-Nueva Era Road / Ilocos Norte (Sept.2010)	101	204	311	1,881	1,639	2,281
2.Solano-Quezon Road / Nueva Vizcaya (Mar. 2010)	154	255	372	659	N.A. (Note 2)	N.A. (Note 2)
3.Baliwag Bdry.-Candaba Road / Pampanga (Dec. 2008)	391	726	1,066	8,775	14,913	11,368
4.San Juan-Laiya Road / Batangas (Feb.2009)	562	1,530	2,763	N.A. (Note 2)	5,858	3,235
5.Libon-Marocmoc-Pantao Road / Albay (Sep.2009)	156	288	422	1,316	1,807	3,573
6.Looc-Odiongan-San Andres Road / Romblon (Jun.2010)	182	495	905	3,763	6,437	7,235

⁵ Sub-rating for Effectiveness is to be put with consideration of Impact.

⁶ According to the executing agency, the reason for a significant gap between target figures set at the time of appraisal and actual figures was because only natural increase of traffic volume was taken into account, and did not include converted traffic volume nor induced traffic volume when setting the target.

⁷ Because the actual figures way exceed the target, it is worth reconsidering traffic plans for the future.

7.Pandan-Libertad-Antique/Aklan Bdry/ Antique (Jun.2012)	203	434	689	1,333	1,818	2,089
8.Bdry. Antique/Iloilo – Anini-y – V. Jimenez Road / Antique (Mar.2012) (Note 3)	-	-	-	1,527	1,487	2,534
9.Maayon-Cuartero-Jct. Iloilo/Capiz Road / Capiz (Oct.2009)	147	298	463	2,181	2,547	2,750
10.Butuan City-Las Nieves-Esperanza-Bayugan Road / Agusan del Sur and Agusan del Norte (Aug.2012)	207	374	538	2,626	4,032	4,562
11.Prospерidad-Lianga Road / Agusan del Sur and Surigao del Sur (Nov.2010)	517	746	1,097	2,163	2,394	2,649

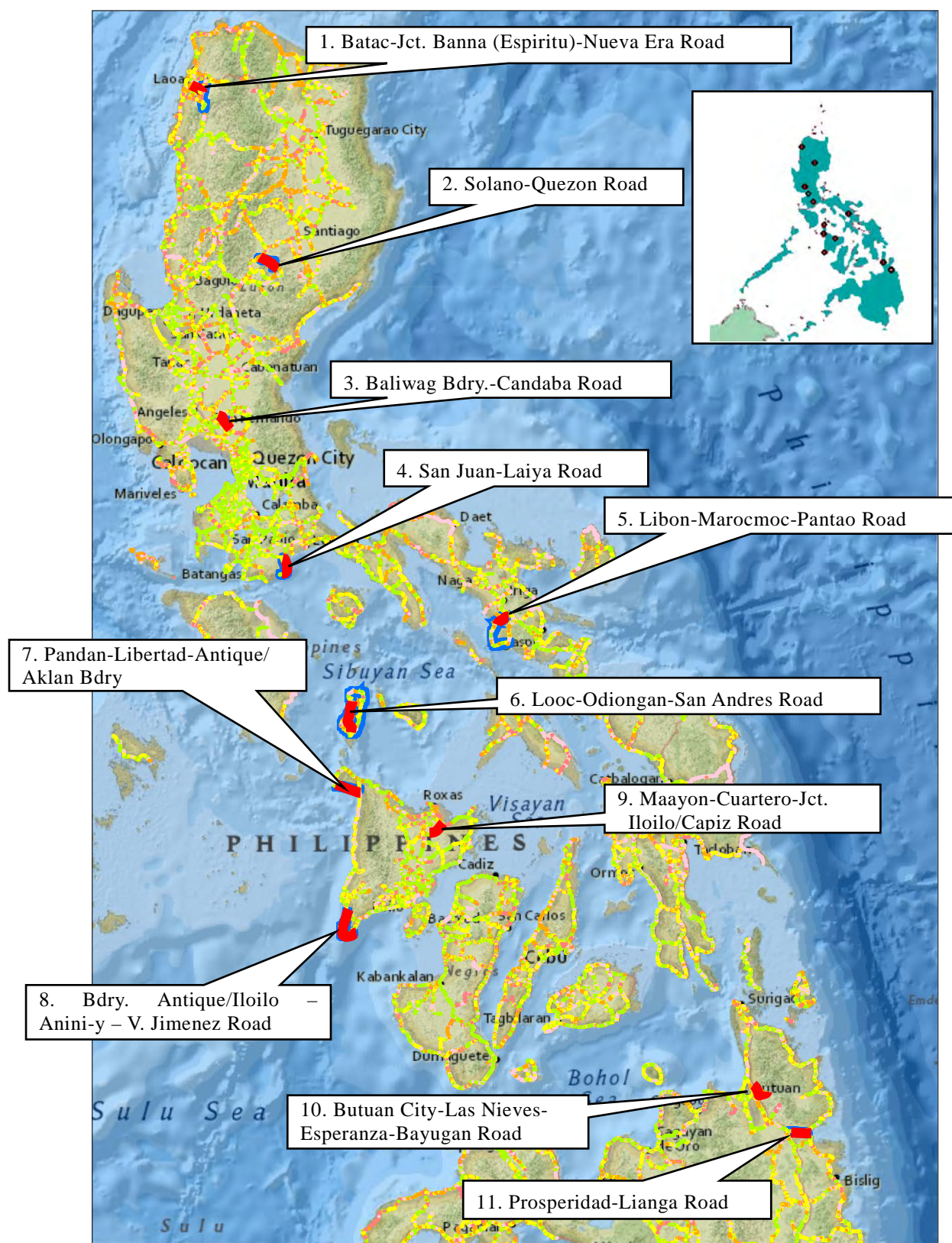
Source: DPWH Planning Section

Note 1) The completion year of the entire project is 2013.

Note 2) Data collection has not been conducted.

Note 3) 8.Bdry. Antique/Iloilo – Anini-y – V. Jimenez Road was added to the scope after the project was started.

The table showing baselines and targets concerning Vehicle Operating Costs Savings (hereinafter referred to as “VOCS”) as well as the actual data for the recent years for each road section is provided under “Reference” (page 37).



Source: Utilized the map provided by DPWH Planning Section.

Figure 1: Location Map for Each Road Section



7. Pandan-Libertad-Antique/Aklan Bdry
(Panay Island, Antique Province)



8. Bdry. Antique/Iloilo – Anini-y – V. Jimenez
Road (Panay Island, Antique Province)



9. Maayon-Cuartero-Jct. Iloilo/Capiz Road
(Panay Island, Capiz Province)



Beneficiary Survey

3.2.2 Qualitative Effects

3.2.2.1 Improvement of Traffic Safety and Reliability

Table 2 shows the results of the beneficiary survey⁸⁹ to 120 residents and farmers in the project area on traffic safety situation after the completion of the project. All the respondents answered that “traffic safety situation was improved” or “no change was observed on traffic safety situation”, and no one responded traffic safety situation was

⁸ Procedures for the beneficiary survey: Beneficiary survey was conducted, targeting three roads located in Capiz Province and Antique Province in Panay Island, central area of the Philippines (Maayon-Cuartero-Jct. Iloilo/Capiz Road (Capiz Province), Pandan-Libertad-Antique/Aklan Bdry (Antique Province), and Bdry. Antique/Iloilo – Anini-y – V. Jimenez Road (Antique Province). 12 barangays were randomly selected from 7 municipalities (municipalities of Anini-y, Tobias Fornier, Hamtic, Pandan, Libertad, Cuartero, and Maayon, covering 148 barangays in total) along the targeted road sections, followed by a random selection of 120 respondents. (Data collection method: hearing investigation.)

Basic information of 120 respondents: Gender: Male 38 (31.7%), Female 82 (68.3%), Age group: 20s 4 (3.3%), 30s 24 (20.0%), 40s 29 (24.2%), 50s 33 (27.5%), 60s and above 30 (25.0%).

worsened. In addition, about 90% of respondents who answered traffic safety situation was improved pointed out that “traffic/warning signs were established”, and about 60% pointed out that “traffic accidents were decreased”.

Table 2: Traffic Safety Situation after the Completion of the Targeted Road Section

Question	Responses (Percentage, total=100%) (Frequency, n=120 residents)
Did you observe any changes regarding traffic safety situation after the completion of the targeted road section?	<ul style="list-style-type: none"> • Yes, traffic safety situation was changed: 48.3% (58 residents) • No change was observed on traffic safety situation: 51.7% (62 residents) • No idea: 0% (no resident)
Question	Responses (sum will not total to 100% (58 residents) since multiple answers were provided)
What kind of traffic safety effects can be observed? (Additional question to 58 residents who answered “Yes, traffic safety situation was changed” to the above question.)	<ul style="list-style-type: none"> • Visible traffic/warning signs: 89.7% (52 residents) • Lesser traffic accidents: 58.6% (34 residents) • Better visibility because of streetlights: 22.4% (13 residents) • Presence of traffic personnel: 8.6% (5 residents) • Clearly indicated speed limit signs: 5.2% (3 residents) • Presence of pedestrian lane: 1.7% (1 resident)

Source: Results from the beneficiary survey

According to the interview with executing agency and municipal government¹⁰, certainty/reliability of road network has improved after the project, however, traffic accidents have increased compared to the situation before the project with increasing traffic volume and speeding drivers (increasing number of accidents hitting animals was also pointed out in the interview). In order to cope with the situation, the executing agency has been making efforts to set up traffic signs and guardrails as well as to ensure that traffic rules are obeyed. According to project beneficiaries (local residents) interviewed during the field study¹¹, they answered that they think traffic accidents have not increased compared with the situation prior to the project.

As mentioned above, the results from beneficiary survey and interview survey with local residents, and interview with executing agency and municipal government have shown different perception of traffic safety situation.¹² On the other hand, the executing agency has been making an endeavor to improve the situation, and therefore, it can be regarded that the situation is getting better as a whole.

¹⁰ Interview with Capiz First and Second District Engineering Offices and Cuartero municipal government located along Maayon-Cuartero-Jct. Iloilo/Capiz Road (Capiz Province).

¹¹ Interview with local residents living in barangays along Bdry. Antique/Iloilo – Anini-y – V. Jimenez Road in Antique Province.

¹² It can be presumed that executing agency and municipal government have grasped negative information on traffic safety situation because they are in a position to obtain broader, comprehensive information compared with local residents.

Tables 3 and 4 show the results of beneficiary survey on certainty/reliability of road network regarding improved access to hospital and university/collage, respectively. Looking at the results, all respondents answered that “travel time to hospital and university/collage has shortened after the completion of the targeted road”.

Table 3: Reduction of Travel Time to Hospital after the Completion of the Targeted Road Section

Question	Responses (Percentage, total=100%) (Frequency, n=120 residents)
Has travel time to hospital shortened after the completion of the targeted road section?	<ul style="list-style-type: none"> • Yes, it has shortened: 100% (120 residents) • No, it has not shortened: 0% (no resident) • No idea: 0% (no resident)
Question	Responses
To what extent travel time to hospital has shortened? (Additional question to 120 residents who answered “Yes, it has shortened” to the above question.)	<ul style="list-style-type: none"> • Less than 15 minutes: 11.7% (14 residents) • 15 minutes to 30 minutes: 55.8% (67 residents) • 30 minutes to 1 hour: 27.5% (33 residents) • 1 hour to 2 hours: 4.2% (5 residents) • 2 hours to 4 hours: 0% (no resident) • More than 4 hours: 0.8% (1 resident)

Source: Results from the beneficiary survey

Table 4: Reduction of Travel Time to University/College after the Completion of the Targeted Road Section

Question	Responses (Percentage, total=100%) (Frequency, n=120 residents)
Has travel time to university/college shortened after the completion of the targeted road section?	<ul style="list-style-type: none"> • Yes, it has shortened: 100% (120 residents) • No, it has not shortened: 0% (no resident) • No idea: 0% (no resident)
Question	Responses
To what extent travel time to university/college has shortened? (Additional question to 120 residents who answered “Yes, it has shortened” to the above question.)	<ul style="list-style-type: none"> • Less than 15 minutes: 4.2% (5 residents) • 15 minutes to 30 minutes: 38.3% (46 residents) • 30 minutes to 1 hour: 39.2% (47 residents) • 1 hour to 2 hours: 17.5% (21 residents) • 2 hours to 4 hours: 0% (no resident) • More than 4 hours: 0.8% (1 resident)

Source: Results from the beneficiary survey

Results of interview survey with executing agency, municipal government and local residents conducted during the field study are shown in Table 5.

Table 5: Results of Interview Survey on Improved Access to Hospital and College/University after the Completion of the Targeted Road Section

Interview with Executing Agency (on travel sections and state of improvement)	
< Using Pandan-Libertad-Antique/Aklan Bdry Road (Antique Province) >	
<ul style="list-style-type: none"> • From Libertad to Pandan proper (distance for about 28km) • From Libertad to Pandan Hospital • From Libertad to Pandan Port 	<ul style="list-style-type: none"> • 90 minutes (before the project) to 45 minutes (after the project) • 60 minutes (do) to 35minutes (do) • 60 minutes (do) to 35 minutes (do)

< Using Bdry. Antique/Iloilo – Anini-y – V. Jimenez Road (Antique Province) >	
<ul style="list-style-type: none"> • From Casay, Anini-y to San Jose proper (distance for about 50km) • From Casay, Anini-y to San Jose Hospital • From Casay, Anini-y to San Jose Airport 	<ul style="list-style-type: none"> • 135 minutes (do) to 95 minutes (do) • 135 minutes (do) to 95 minutes (do) • 140 minutes (do) to 100 minutes (do)
Interview with Local Residents Living Along Bdry. Antique/Iloilo – Anini-y – V. Jimenez Road (Antique Province)	
<ul style="list-style-type: none"> • Travel time to a major urban center (Iloilo City, distance for about 100km) has shortened from 4 hours to 2.5 hours comparing before and after the project, thereby improved access to airport and hospital has realized. 	
Interview with Cuartero Municipal Government Located Along Maayon-Cuartero-Jct. Iloilo/Capiz Road (Capiz Province)	
<ul style="list-style-type: none"> • Travel time to a major urban center (Roxas City, distance for about 41km) has shortened from 90 minutes to 45 minutes comparing before and after the project, thereby improved access to airport and hospital has realized. • Travel time to Capiz State University has shortened from 45 minutes to 20 minutes, thereby improved road access has realized. • After the completion of the project, patrol activities became available, thereby improving security situation in the area. (For reference: There have been rebel activities by the New People’s Army in the mountainous area, however, after the project, with improved road conditions, surveillance activities became possible, and thus discipline and order have restored to some extent in the area.) 	

As a result of beneficiary survey and interview survey, it can be judged that enhanced certainty/reliability of road network as well as improved access to different institutions have realized with the project.

3.2.2.2 Promotion of Regional Development through Improved Market Access and Enhanced Transport Efficiency

Tables 6, 7, and 8 show the results of beneficiary survey to local residents and farmers regarding improved market access after the completion of the project, respectively. According to the results, all respondents answered that “travel time to market / palay (rice) and corn collection point / major urban centers have shortened after the completion of the targeted road”. In addition, about 90% of respondents answered that reduced travel time to market, palay and corn collection point was less than 30 minutes, and about 90% of respondents answered that reduced travel time to major urban centers was between 30 minutes and two hours.

Table 6: Improvement of Market Access after the Completion of the Targeted Road Section

Question	Responses
	(Percentage, total=100%) (Frequency, n=120 residents)
Has travel time to market shortened after the completion of the targeted road section?	<ul style="list-style-type: none"> • Yes, it has shortened: 100% (120 residents) • No, it has not shortened: 0% (no resident) • No idea: 0% (no resident)

Question	Responses
To what extent travel time to market has shortened? (Additional question to 120 residents who answered “Yes, it has shortened” to the above question.)	<ul style="list-style-type: none"> • Less than 15 minutes: 46.7% (56 residents) • 15 minutes to 30 minutes: 43.3% (52 residents) • 30 minutes to 1 hour: 9.2% (11 residents) • 1 hour to 2 hours: 0% (no resident) • 2 hours to 4 hours: 0% (no resident) • More than 4 hours: 0.8% (1 resident)

Source: Results from the beneficiary survey

Table 7: Reduction of Travel Time to Palay and Corn Collection Point after the Completion of the Targeted Road Section

Question	Responses (Percentage, total=100%) (Frequency, n=120 residents)
Has travel time to palay/corn collection point shortened after the completion of the targeted road section?	<ul style="list-style-type: none"> • Yes, it has shortened: 100% (120 residents) • No, it has not shortened: 0% (no resident) • No idea: 0% (no resident)
Question	Responses
To what extent travel time to palay/corn collection point has shortened? (Additional question to 120 residents who answered “Yes, it has shortened” to the above question.)	<ul style="list-style-type: none"> • Less than 15 minutes: 49.2% (59 residents) • 15 minutes to 30 minutes: 42.5% (51 residents) • 30 minutes to 1 hour: 7.5% (9 residents) • 1 hour to 2 hours: 0% (no resident) • 2 hours to 4 hours: 0% (no resident) • More than 4 hours: 0.8% (1 resident)

Source: Results from the beneficiary survey

Table 8: Reduction of Travel Time to Urban Centers after the Completion of the Targeted Road Section

Question	Responses (Percentage, total=100%) (Frequency, n=120 residents)
Has travel time to major urban centers shortened after the completion of the targeted road section?	<ul style="list-style-type: none"> • Yes, it has shortened: 100% (120 residents) • No, it has not shortened: 0% (no resident) • No idea: 0% (no resident)
Question	Responses
To what extent travel time to major urban centers has shortened? (Additional question to 120 residents who answered “Yes, it has shortened” to the above question.)	<ul style="list-style-type: none"> • Less than 15 minutes: 0% (no resident) • 15 minutes to 30 minutes: 10.0% (12 residents) • 30 minutes to 1 hour: 46.7% (56 residents) • 1 hour to 2 hours: 40.8% (49 residents) • 2 hours to 4 hours: 2.5% (3 residents) • More than 4 hours: 0% (no resident)

Source: Results from the beneficiary survey

Results from interview survey with executing agency, municipal government and local residents conducted during field study are shown in Table 9.

Table 9: Results of Interview Survey on Improved Market Access after the Completion of the Targeted Road Section

Interview with Executing Agency (on travel sections and state of improvement)	
< Using Bdry. Antique/Iloilo – Anini-y – V. Jimenez Road (Antique Province) >	
<ul style="list-style-type: none"> • From Casay, Anini-y to major urban center (i.e. San Jose, provincial capital of Antique Province) (distance for about 50km) • From Casay, Anini-y to palay collection point in San Jose 	<ul style="list-style-type: none"> • 135 minutes (before the project) to 95 minutes (after the project) • 145 minutes (do) to 105 minutes (do)
Interview with Cuartero Municipal Government Located Along Maayon-Cuartero-Jct. Iloilo/Capiz Road (Capiz Province)	
<ul style="list-style-type: none"> • Travel time to Poblacion where collection point for major agricultural crops, palay and corn, is located has shortened from 90 minutes to 60 minutes, thereby road access was improved. 	

As a result of beneficiary survey and interview survey, it can be judged that improved market access as well as enhanced transport efficiency has been realized with the project, and the project is contributing to the promotion of regional development.

3.3 Impact

3.3.1 Intended Impacts

3.3.1.1 Impacts on Local Farmers' Income

Table 10 shows the results of beneficiary survey to local residents and farmers in the project area regarding effects on their income after the completion of the project. 112 respondents out of 120 (more than 93%) answered that their income has increased. In addition, following answers were obtained as a result of interview survey with local residents during the field study.¹³ They have shown satisfaction to the project's positive impacts on income (increased income opportunities and enhanced efficiency of agricultural activities).

- Local residents' major sources of income are agriculture, fishery, running small shops, OFW (Overseas Filipino Workers) and so on, and their income has increased after the project because of improved access to market, and palay and corn collection point as well as increased income opportunities.

Table 10: Effects on Local Farmers' Income after the Completion of the Targeted Road Section

Question	Responses (Percentage, total=100%) (Frequency, n=120 residents)
Were there any changes in local farmers' income after the completion of the targeted road section?	<ul style="list-style-type: none"> • Income was increased: 93.3% (112 residents) • No change in income: 5.8% (7 residents) • Income was decreased: 0.8% (1 resident)

¹³ Interview with local residents living in barangays along Maayon-Cuartero-Jct. Iloilo/Capiz Road (Capiz Province) and Bdry. Antique/Iloilo – Anini-y – V. Jimenez Road (Antique Province).

	<ul style="list-style-type: none"> • Others: 0% (no resident) • No idea: 0% (no resident)
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Source: Results from the beneficiary survey

3.3.1.2 Contribution to Activation of Local Economic Activities

Table 11 shows the results of beneficiary survey to local residents and farmers in the project area regarding effects on local economic activities after the completion of the project. All the respondents (120 local residents) answered “local economy has been activated since the completion of the targeted road section”. Some concrete responses were: “number of business establishments (companies, shops and offices) has increased”, “number of lending facilities (banks and pawnshops) has increased” and “number of groceries/sari-sari stores has increased”, which indicate that the project has generated positive impacts on local economy.

Table 11: Effects on Local Economy after the Completion of the Targeted Road Section

Question	Responses (Percentage, total=100%) (Frequency, n=120 residents)
Were there any effects on local economy after the completion of the targeted road section?	<ul style="list-style-type: none"> • Activated: 100% (120 residents) • No change: 0% (no resident) • Slowed down: 0% (no resident) • Others: 0% (no resident) • No idea: 0% (no resident)
Question	Responses (sum will not total to 100% (120 residents) since multiple answers were provided)
What are specific examples of such "activated economic activities"? (Additional question to 120 residents who answered “Activated” to the above question.)	<ul style="list-style-type: none"> • Increased number of business establishments: 46.7% (56 residents) • Increased number of lending facilities (banks, pawnshops etc.): 33.3% (40 residents) • Increased number of groceries/sari-sari stores: 15.8% (19 residents) • More local investments: 8.3% (10 residents) • Increased number of tourists: 8.3% (10 residents) • More transport services: 7.5% (9 residents) • Increased employment / employment opportunities: 7.5% (9 residents) • Increased number of vendors: 5.8% (7 residents) • More eateries: 4.2% (5 residents) • More gasoline stations: 4.2% (5 residents) etc.

Source: Results from the beneficiary survey

As regards data on agricultural production, the yield trends of palay and corn in project targeted provinces (11 provinces) and those in the entire country are shown in the respective tables in the Attachment (pages 38-39). Completion year and month for each road section is different, and it is difficult to see evident correlation between the data shift

and the project, comparing the figures before and after the completion of the targeted road sections. Even so, looking at the overall trend for 11 project targeted provinces, while production of both palay and corn decreased in 2009 and 2010, an upward trend can be seen after 2011 – growth rates for both palay and corn production in 11 provinces have substantially exceeded those in the entire country especially in 2013. Taking into account various analysis including the results of the beneficiary survey, it can be considered that the project has contributed to the increase of agricultural production to some extent through enhanced transport efficiency of farm products.

As regards data on business activities, the trends in the numbers of establishments and employment in project targeted provinces (11 provinces) and those in the entire country are shown in the table in the Attachment (page 40). Completion year and month for each road section is different, and it is difficult to see evident correlation between the data shift and the project, comparing the figures before and after the completion of the targeted road sections. Nevertheless, looking at the overall trend for 11 project targeted provinces, both the numbers of establishments and employment show increasing trend, and their growth rates exceed those in the entire country in 2012.

3.3.2 Other Impacts

3.3.2.1 Impacts on the Natural Environment

The Environmental Compliance Certificate (hereinafter referred to as “ECC”) was issued by the Department of Environment and Natural Resources (hereinafter referred to as “DENR”) for all road sections in the project, and the EMP (Environmental Management Plan) was complied with during the project implementation period.

As regards environmental monitoring during project implementation, a monitoring team consisting of different organizations (DPWH, DENR, Local Government Units (hereinafter referred to as “LGUs”) of concerned province and municipalities, consultants etc.) was formulated and monitoring activities were conducted every quarter. The results were compiled in quarterly reports (major check items were air quality, water quality, noise, topography, erosion, and ecology.)

No particular impact has been observed on natural environment as a result of environmental monitoring.

According to the executing agency, as part of its environmental monitoring, it provided guidance to the contractors to give necessary environmental consideration during project implementation, and thus contractors have taken necessary mitigation measures.¹⁴

¹⁴ Concrete measures include watering to mitigate effect on air quality (dust suppression) and limiting time for construction work to avoid civil works in early morning and at night.

Therefore, it can be considered that there is no major problem affecting on natural environment. Moreover, no particular complaint was pointed out in the interviews with LGUs and local residents.

Furthermore, the results of interview survey with local residents during the field study have shown no particular problem affecting natural environment during construction and after completion of the project (in fact, some residents pointed out temporary effects during construction period but they mentioned that the effects had been kept within an acceptable range, and that improvements were seen after the project completion).

Regarding the results of beneficiary survey to local residents and farmers in the project area, 89 respondents out of 120 beneficiaries (around 74% of total respondents) said that there were temporary effects on natural environment such as scattering of dust and noise during construction. However, 117 respondents (around 98% of the total respondents) answered “natural environment has improved” or “there has been no effect on natural environment” after the project completion. Now, therefore, it can be judged that there was no negative environmental problem caused by the Project.

3.3.2.2 Land Acquisition and Resettlement

The executing agency has carried out procedures for land acquisition and compensation payments based on the Land Acquisition and Resettlement Action Plan, following the DPWH’s guideline (Infrastructure ROW Procedural Manual, April 2003). According to the interviews with the executing agency and local residents during the field study, consultations and public hearing regarding the contents of the project were carried out on continuous basis prior to its launch, reaching agreements on the amount of compensation without any problems. No particular problem has been observed for land acquisition and compensation procedures since the process had been taken appropriately.

It was confirmed through the project site survey and the interview with local residents that there were residents whose structures (fence and trees etc.) had not been removed despite the initial plan, as a result of the executing agency’s efforts to minimize effects of land acquisition. Consequently, Resettlement Action Plan was no longer necessary because structures were just scooted back within the same piece of land, and resettlement did not actually take place for legal land owners. For those illegally occupying the land, compensation for land was not paid to them – they only received compensation in case their structures were demolished.

The results of land acquisition for each road section are summarized in Table 12.

Table 12: Results of Land Acquisition

Road Section / Province	Number of Residents whose Structures and Perennial Trees have been Affected by the Project
1.Batac-Jct. Banna (Espiritu)-Nueva Era Road / Ilocos Norte	65
2.Solano-Quezon Road / Nueva Vizcaya	30
3.Baliwag Bdry.-Candaba Road / Pampanga	48
4.San Juan-Laiya Road / Batangas	26
5.Libon-Marocmoc-Pantao Road / Albay	305
6.Looc-Odiongan-San Andres Road / Romblon	285
7.Pandan-Libertad-Antique/Aklan Bdry/ Antique	494
8.Bdry. Antique/Iloilo – Anini-y – V. Jimenez Road / Antique	680
9.Maayon-Cuartero-Jct. Iloilo/Capiz Road / Capiz	81
10.Butuan City-Las Nieves-Esperanza-Bayugan Road / Agusan del Sur and Agusan del Norte	970
11.Prospерidad-Lianga Road / Agusan del Sur and Surigao del Sur	515
Total	3,499

Source: Results from questionnaire survey of executing agency

This project has largely achieved its objectives. Therefore its effectiveness and impact is high.

3.4 Efficiency (Rating: ①)

3.4.1 Project Outputs

Comparison of planned and actual project outputs is summarized in Table 13.

Table 13: Comparison of Planned and Actual Project Outputs

Road Section / Province	Plan		Actual	
	Total Length (km)	Number of Target Bridges	Total Length (km)	Number of Target Bridges
1.Batac-Jct. Banna (Espiritu)-Nueva Era Road / Ilocos Norte	12.19	-	12.21 (Note 1)	-
2.Solano-Quezon Road / Nueva Vizcaya	8.15	3	8.15	1
3.Baliwag Bdry.-Candaba Road / Pampanga	5.55	1	2.10	0
4.San Juan-Laiya Road / Batangas	9.80	4	23.10 (Note 2)	1
5.Libon-Marocmoc-Pantao Road / Albay	16.45	3	16.45	0
6.Looc-Odiongan-San Andres Road / Romblon	37.26	-	37.26	6
7.Pandan-Libertad-Antique/Aklan Bdry/ Antique	27.10	13	27.76 (Note 1)	12
8.Bdry. Antique/Iloilo – Anini-y – V. Jimenez Road / Antique (Note 3)	-	-	29.95	5
9.Maayon-Cuartero-Jct. Iloilo/Capiz Road / Capiz	41.35	1	41.45	1
10.Butuan City-Las Nieves-Esperanza-Bayugan Road / Agusan del Sur and Agusan del Norte	59.26	2	59.26	4
11.Prospерidad-Lianga Road / Agusan del Sur and Surigao del Sur	21.15	2	21.15	2
Total	238.26	29	278.84	32

Source: Information from JICA at the time of appraisal, results from questionnaire survey of executing agency, and interview survey results from the field study

Note 1) Repairs of damaged portion of road, such as approach road of existing bridges were conducted additionally.

Note 2) Repairs of damaged portion of road were conducted additionally.

Note 3) 8.Bdry. Antique/Iloilo – Anini-y – V. Jimenez Road was added to the scope after the project was started.

The original scope of the project at the time of appraisal was to upgrade the ten segments of national secondary roads in 11 provinces (upgrading unpaved roads, widening of roads from single-lane to two-lane roads in some part, replacing Bailey bridges with permanent bridges, and replacing single-lane temporary bridges¹⁵ with two-lane permanent bridges). In actuality, Bdry. Antique/Iloilo – Anini-y – V. Jimenez Road in Antique Province was added to the scope (the reason to be described), and thus, eleven segments of national secondary roads in 11 provinces were upgraded. Below describes the main changes in the outputs.

- Number of targeted bridges was decreased from 3 to 1 for 2. Solano-Quezon Road in Nueva Vizcaya Province: 1 of 2 deleted bridges was included in the scope for another Japanese ODA loan project (Urgent Bridges Construction Project for Rural Development), and another bridge was deleted because of funding issues on the side of the Philippines.
- Total road improvement length for 3. Baliwag Bdry.-Candaba Road in Pampanga Province was decreased from 5.55km to 2.10km: Road improvement in Candaba swamp area was very costly due to necessary soft-ground stabilization, therefore the section was dropped. With this, development of a bridge in the area was deleted.
- Total road improvement length for 4. San Juan-Laiya Road in Batangas Province was increased from 9.80km to 23.10km: During the implementation stage, it was found that additional rehabilitation of damaged road was necessary, therefore, repair was conducted in addition to the original plan for precast concrete pavement (PCCP) of gravel roads (9.80km). Also, at the time of detailed design, it was found that development of 3 out of 4 targeted bridges was already completed utilizing GOP¹⁶ fund, thus the bridges were deleted from the scope.
- Number of targeted bridges was decreased from 3 to 0 for 5. Libon-Marocmoc-Pantao Road in Albay Province: It was found that all 3 bridges were already replaced at the time of detail design, thus they were deleted from the scope.
- Number of targeted bridges was increased from 0 to 6 for 6. Looc-Odiongan-San

¹⁵ Bridges built temporarily on the detour in order to replace existing bridges by permanent bridges on the original road, bridges built along the construction road, and bridges built to be used temporarily at the time of disaster such as flood and earthquake.

¹⁶ Government of the Philippines

Andres Road in Romblon Province: With road improvement (including approach road for bridges), additional bridges were included in the scope due to necessary height adjustment between roads and bridges.

- Number of targeted bridges was decreased from 13 to 12 for 7. Pandan-Libertad-Antique/Aklan Bdr in Antique Province: The deleted bridge was developed utilizing GOP fund.
- 8. Bdry. Antique/Iloilo – Anini-y – V. Jimenez Road in Antique Province and 5 bridges along the road was added to the scope: The road was urgently needed for disaster management purpose, therefore included in the scope.¹⁷ With the road improvement, 5 bridges along the road were added.
- Number of targeted bridges was increased from 2 to 4 for 10. Butuan City-Las Nieves-Esperanza-Bayugan Road in Agusan del Sur Province and Agusan del Norte Province: It was found that deterioration was serious and urgent replacement was necessary, therefore 2 bridges were added to the scope during the implementation stage.

These changes of outputs are deemed appropriate, in light of the actual situation at the start of the civil works.

According to the executing agency, the road width has been widened to 6.1m, in accordance with the DPWH guideline, so called “Blue Book”, standard specifications used in the implementation of road, bridge and airport developments (revised in 1995 and 2004), and in this regard, no problems with standard and quality of the outputs. In fact, no particular problem has been observed as a result of field survey.

One of the main points discussed at the time of appraisal was to make sure that the executing agency secures efficiency and quality of construction works for smooth implementation of the project by employing capable contractors through strictly complying with Pre Qualification (hereinafter referred to as “PQ”) criteria in all tendering. In this respect, the executing agency pointed out that they have strictly applied the improved PQ criteria in all tendering, realizing to procure quality contractors, and thus producing high quality outputs.

While the planned consulting services have been implemented, the entire amount of inputs has decreased as shown in Table 14.

¹⁷ The existing mountainous road connecting the west coast of the targeted road area (a road leading to San Jose de Buenavista, provincial capital of Antique Province) and the east coast of the targeted road area (a road leading to Iloilo City, provincial capital of Iloilo Province) was impassable during typhoon and rainy season due to landslides. As such, the improvement of this coastal road, connecting the east and west coast was necessary for the purpose of disaster control.

<Planned Consulting Services>

- Detailed Design, assistance in tendering, construction supervision of the project
- Transfer of technology to executing agency staffs regarding operation and maintenance
- Environmental monitoring necessary for environmental consideration and to comply with ECC requirement
- Assistance to the executing agency for the coordination with provincial government concerned

Table 14: Comparison of Planned and Actual Inputs of Consulting Service (M/M)

	Plan	Actual	Comparison
Foreign	113	129	Increased by 16
Local	1,747	1,530.7	Decreased by 216.3
Total	1,860	1,659.7	Decreased by 200.3

Source: Information from JICA at the time of appraisal, results from questionnaire survey of executing agency, and interview survey results from the field study

According to the executing agency, total amount of inputs decreased because of budget shortage – the executing agency selected 4 road sections for contracting out to consultants, while the rest of the 7 road sections have been managed directly by the executing agency (consultants conducted only implementation monitoring for these 7 road sections).

<4 Road Sections Contracted Out for Consulting Services in this Project>

- 5. Libon-Marocmoc-Pantao Road / Albay
- 6. Looc-Odiongan-San Andres Road / Romblon
- 8. Bdry. Antique/Iloilo – Anini-y – V. Jimenez Road / Antique
- 11. Prosperidad-Lianga Road / Agusan del Sur and Surigao del Sur

3.4.2 Project Inputs

3.4.2.1 Project Cost

The total project cost was initially planned to be 8,273 million yen (out of which 6,205 million yen was to be covered by Japanese ODA loan). In reality, the total project cost was 10,410 million yen (out of which 4,540 million was covered by Japanese ODA loan), which is higher than planned (126%¹⁸ of the planned amount).

The main reason for project cost overrun was due to inflation – cost of basic

¹⁸ This percentage was calculated by comparing the actual cost after the scope change and planned cost before the scope change because the executing agency has not made cost estimation based on the change of scope and the increase/decrease of outputs.

construction inputs increased throughout the project implementation period. According to the executing agency, cost of inputs such as materials, equipments operation and labor increased by an average of 19% over the 2005 costs (despite a depreciation of local currency (Philippine peso) during the project implementation period, the total project cost exceeded the initial plan because of significant increase of project cost in peso terms). This was unavoidable factor beyond control. As a measure to cope with increasing cost, the executing agency deleted construction supervision portion from the consulting services for 7 road sections out of 11, and managed directly.¹⁹ In addition, for civil works, the executing agency also deleted construction of some bridges from the project scope as mentioned above.

3.4.2.2 Project Period

The overall project period was planned as 68 months, from March 2001 (conclusion of Loan Agreement) to October 2006 (completion of civil works) as opposed to 152 months in reality, from May 2001 (conclusion of Loan Agreement) to December 2013 (completion of civil works), which is significantly longer than planned (224% of the initial plan).

Table 15 shows comparisons of planned and actual project period.

Table 15: Comparison of Planned and Actual Project Period

Item	Planned (At Project Appraisal)	Actual (At Ex-post Evaluation)
1. Selection of consultants	Jul. 2000 – Jun. 2001 (12 months)	Feb. 2001 – Dec. 2002 (23 months)
2. Detailed design	Jul. 2001 – Sept. 2002 (15 months)	Jan. 2003 – Mar. 2004 (15 months)
3. Bidding process	May 2002 – Oct. 2003 (18 months)	Oct. 2005 – Jun. 2007 (21 months)
4. Civil works	Aug. 2003 – Oct. 2006 (39 months)	Jul. 2007 – Dec. 2013 (78 months)
5. Land acquisition	Oct. 2001 – Dec. 2002 (15 months)	N.A.
6. Consulting services	Jul. 2001 – Oct. 2006 (64 months)	Jan. 2003 – Nov. 2012 (119 months)

Source: Information from JICA at the time of appraisal, results from questionnaire survey of executing agency, and interview survey results from the field study

The delay in the implementation schedule was caused mainly by the delay in Investment Coordination Committee (ICC)'s clearance for increase of project cost and additional project scope, delay in bidding process (selection of consultants and contractors), and extended implementation period due to change and additional project scope (additional civil works for Bdry. Antique/Iloilo – Anini-y – V. Jimenez Road, which includes development of 5 bridges).

¹⁹ According to the executing agency, Bdry. Antique/Iloilo – Anini-y – V. Jimenez Road was added to the project scope prior to the issue of project cost overrun became apparent.

3.4.3 Results of Calculations of Internal Rates of Return (Reference only)

Table 16 shows the result of recalculation of the economic internal rate of return (EIRR) based on the preliminary calculation conducted at the time of appraisal and the data and information obtained from the executing agency.

Table 16: Assumption and Results of EIRR Recalculation

	Road Section	At Project Appraisal	At Ex-post Evaluation
EIRR	1.Batac-Jct. Banna (Espiritu)-Nueva Era Road / Ilocos Norte	12.5%	128.4%
	2.Solano-Quezon Road / Nueva Vizcaya	21.6%	N.A. (Note 1)
	3.Baliwag Bdry.-Candaba Road / Pampanga	20.1%	242.6%
	4.San Juan-Laiya Road / Batangas	27.3%	48.6%
	5.Libon-Marocmoc-Pantao Road / Albay	14.2%	51.5%
	6.Looc-Odiongan-San Andres Road / Romblon	17.3%	54.0%
	7.Pandan-Libertad-Antique/Aklan Bdry/Antique	13.9%	24.3%
	8.Bdry. Antique/Iloilo – Anini-y – V. Jimenez Road / Antique (Note 2)	-	15.4%
	9.Maayon-Cuartero-Jct. Iloilo/Capiz Road / Capiz	18.2%	26.0%
	10.Butuan City-Las Nieves-Esperanza-Bayugan Road / Agusan del Sur and Agusan del Norte	13.7%	19.3%
	11.Prospерidad-Lianga Road / Agusan del Sur and Surigao del Sur	26.7%	25.31%
Benefit	VOCS as a result of improved road conditions, and operation and maintenance cost savings		
Cost	Project design and construction cost		
Project Life	20 years after project completion		

Note1) N.A. because AADT data on the concerned road section has not been collected, and thus VOCS calculation necessary to recalculate EIRR cannot be made.

Note 2) 8.Bdry. Antique/Iloilo – Anini-y – V. Jimenez Road was added to the scope after the project was started.

The EIRRs for 1. Batac-Jct. Banna (Espiritu)-Nueva Era Road and 3. Baliwag Bdry.-Candaba Road exceeded more than 10 times the figures calculated at the time of appraisal, reflecting the fact that the actual AADT and VOCS greatly exceeded their targets set forth at the time of appraisal. As regards 11. Prosperidad-Lianga Road, the EIRR fell a little below the figure calculated at the time of appraisal. It can be regarded that while the actual AADT and VOCS of this road section exceeded the targets set forth at the time of appraisal, sizable increase did not take place as compared with those in the other road sections, and therefore the cost increase factor dragged down the EIRR.

The project cost exceeded the plan, while the project period significantly exceeded the plan. Therefore efficiency of the project is low.

3.5 Sustainability (Rating: ②)

3.5.1 Institutional Aspects of Operation and Maintenance

At the national level, Bureau of Maintenance (hereinafter referred to as “BOM”) is responsible for the operation and maintenance of roads and bridges developed through the project. At the regional level, each Regional Office of DPWH is responsible for its respective roads and bridges. The actual operation and maintenance work in the field is undertaken by each District Engineering Office (hereinafter referred to as “DEO”) in charge, under the supervision of respective Regional Office.²⁰ Operation and maintenance system is taken such that respective Regional Offices and DEOs are in close coordination to do their work in the field.

Table 17 summarizes Regional Offices and DEOs in charge of each road section developed by the project, and the number and breakdown of operation and maintenance staffs in each DEO. According to a result of interview survey and questionnaire survey of each DEO, the number of staffs necessary for operation and maintenance work is basically sufficient. In addition, as regards Antique DEO and Capiz First and Second DEO, where interview survey was conducted, no particular problem has been identified regarding the organizational structure of operation and maintenance of roads and bridges developed by the project at the time of ex-post evaluation.

Table 17: Regional Offices and DEOs in charge of Operation and Maintenance of the Project and the Number of O&M Staffs in Each DEO

Road Section	Regional Office in Charge	DEO (Number of O&M Staffs and its Breakdown in Parentheses) Note: DPWH outsources routine/regular maintenance work to local residents as Road Maintenance Crew (RMC)
1.Batac-Jct. Banna (Espiritu)-Nueva Era Road / Ilocos Norte	DPWH Region I	<Ilocos Norte Second DEO (23 staffs in total)> Engineer (3), Foreman/Capataz (1), Heavy Equipment Operator (3), Road Side Workers (16, including 10 RMCs)
2.Solano-Quezon Road / Nueva Vizcaya	DPWH Region II	<Nueva Vizcaya DEO (12 staffs in total)> Engineer (2), Foreman/Capataz (1), Heavy Equipment Operator (1), Road Side Workers (8, including 5 RMCs)
3.Baliwag Bdry.-Candaba Road / Pampanga	DPWH Region III	<Pampanga First DEO (13 staffs in total)> Engineer (2), Foreman/Capataz (1), Heavy Equipment Operator (2), RMC (8)

²⁰ At the time of ex-post evaluation, 16 Regional Offices and 182 DEOs under the supervision of respective Regional Offices are established throughout the nation.

4.San Juan-Laiya Road / Batangas	DPWH Region IV-A	< Batangas Fourth DEO (14 staffs in total) > Engineer (2), Foreman/Capataz (2), Heavy Equipment Operator (2), RMC (8)
5.Libon-Marocmoc-Pantao Road / Albay	DPWH Region V	< Albay Third DEO (8 staffs in total) > Engineer (2), Foreman/Capataz (1), Heavy Equipment Operator (1), RMC (4)
6.Looc-Odiongan-San Andres Road / Romblon	DPWH Region IV-B	< Romblon DEO (16 staffs in total) > Engineer (2), Foreman/Capataz (2), Heavy Equipment Operator (2), RMC (10)
7.Pandan-Libertad-Antique/Aklan Bdry/ Antique	DPWH Region VI	< Antique DEO (8 staffs in total) > Engineer (2), Foreman/Capataz (1), Heavy Equipment Operator (1), RMC (4)
8.Bdry. Antique/Iloilo – Anini-y – V. Jimenez Road / Antique	DPWH Region VI	< Antique DEO (8 staffs in total) > Engineer (2), Foreman/Capataz (1), Heavy Equipment Operator (1), RMC (4)
9.Maayon-Cuartero-Jct. Iloilo/Capiz Road / Capiz	DPWH Region VI	< Capiz First DEO (8 staffs in total) > Engineer (2), Foreman/Capataz (1), Heavy Equipment Operator (1), RMC (4) < Capiz Second DEO (12 staffs in total) > Engineer (2), Foreman/Capataz (1), Heavy Equipment Operator (1), RMC (8)
10.Butuan City-Las Nieves-Esperanza-Bayugan Road / Agusan del Sur and Agusan del Norte	DPWH Region XIII	< Butuan City DEO (21 staffs in total) > Engineer (2), Foreman/Capataz (1), Heavy Equipment Operator (3), RMC (15) < Agusan del Norte First DEO (8 staffs in total) > Engineer (2), Foreman/Capataz (1), Heavy Equipment Operator (1), RMC (4) < Agusan del Sur First DEO (8 staffs in total) > Engineer (2), Foreman/Capataz (1), Heavy Equipment Operator (1), RMC (4)
11.Prospiedad-Lianga Road / Agusan del Sur and Surigao del Sur	DPWH Region XIII	< Agusan del Sur First DEO (13 staffs in total) > Engineer (2), Foreman/Capataz (2), Heavy Equipment Operator (1), RMC (8) < Surigao del Sur First DEO (8 staffs in total) > Engineer (2), Foreman/Capataz (1), Heavy Equipment Operator (1), RMC (4)

Source: Results from questionnaire survey of each DEO, and interview survey results from the field study

DPWH is currently implementing its Rationalization Plan, aiming to increase efficiency and streamline its administrative structures.²¹ As part of this initiative, site workers in charge of routine/periodic maintenance work for roads and bridges (responsible for cleaning, vegetation control, road repair etc.) have been employed from the local residents as Road Maintenance Crew (hereinafter referred to as “RMC”) under the supervision of DPWH.²² This RMC system – utilizing local labor and generating employment – has been initiated through collaboration between DPWH and Department of Social Welfare and Development (hereinafter referred to as “DSWD”), and the system

²¹ DPWH headquarters had set up many Project Management Offices (hereinafter referred to as “PMOs”), however, organizational restructuring took place in June 28, 2013 based on its Rationalization Plan. As a result, PMOs were merged under one Unified Project Management Office (hereinafter referred to as “UPMO”). As regards roads and bridges, three departments – Road Management Department (in charge of international organizations), Road Management Department (in charge of bilateral donors), and Bridge Management Department – were established under the UPMO.

²² According to the staff placement standard of DPWH, it is appropriate to deploy one RMC per 3.5km of road extension.

has been utilized as part of social welfare for poor households (job creation and livelihood support of local residents).²³



Road Maintenance Crew

3.5.2 Technical Aspects of Operation and Maintenance

As regards Antique DEO and Capiz First and Second DEO, where interview survey was conducted, on the job training (OJT) is provided to operation and maintenance staffs. In addition, trainings are conducted on an irregular base by DPWH headquarters and Regional Office. The staffs are capable to cope with arising issues adequately on their own. Therefore, it can be observed that there are no major problems with the technical aspects of the operation and maintenance of the DEOs. In addition, according to the answers to the questionnaires from each DEO, annual work plans for operation and maintenance, covering the road sections and bridges developed by the project, have been prepared. Furthermore, DPWH Highway Maintenance Manual (1984) has been utilized by the operation and maintenance staffs, and methodology for operation and maintenance has been standardized across DPWH. In sum, no particular problem has been observed from technical aspects.

Highway Maintenance Manual (1984) is under revision with JICA Technical Cooperation Project, “Improvement of Quality Management for Highway and Bridge Construction & Maintenance, Phase 2”, at the time of ex-post evaluation. According to

²³ Memorandum of Agreement has been signed between DPWH and DSWD – DPWH selects 80% of local residents employed under the RMC system, and the remaining 20% to be selected from “4Ps” eligible households (poor households) defined by DSWD. “4Ps” stands for Pantawid Pamilyang Pilipino Program (livelihood program for the Filipino families), which was introduced as Conditional Cash Transfer Program, aiming to improve health, nutrition and education of extremely poor households (particularly of households with children aged 0-18 and pregnant women). Salaries for RMCs (including those selected from “4Ps” eligible households) are covered from Motor Vehicle User’s Charge, a special road fund to ensure the adequate maintenance of roads allocated to each DEO, and regular maintenance fund, through general approved allocations (general fund).

BOM, DPWH's operation and maintenance work for roads and bridges, including those improved by the project, will be conducted based on the new manual after its completion. The new manual has been prepared in light of the current quality control technology for operation and maintenance of roads and bridges, new facilities expected to be introduced²⁴, re-examined standard unit costs for maintenance activities and so on.

3.5.3 Financial Aspects of Operation and Maintenance

The annual operation and maintenance costs associated with the project are first estimated by DEOs based on their annual work plan, then estimation will be reviewed by respective Regional Offices, followed by a review by DPWH headquarters (BOM) in Manila. Once approved, the budget is drawn out from DPWH headquarters' ordinary budget and allocated to respective DEOs. According to DPWH, operation and maintenance budget has not been sufficiently allocated while on the other hand, the situation is not too critical as far as being judged from the results of project site survey and interview with relevant stakeholders.

There are 4 types²⁵ of DPWH operation and maintenance budget for roads and bridges as listed below.

1. Routine maintenance budget
2. Motor Vehicle User's Charge (hereinafter referred to as "MVUC")
3. Calamity fund
4. Emergency fund

1. Routine maintenance budget is an annual maintenance budget allocated to DEOs from DPWH headquarters. It comes from general fund or General Approved Allocations (hereinafter referred to as "GAA"). The budget is calculated based on Equivalent Maintenance Kilometer (hereinafter referred to as "EMK") system.²⁶ DPWH has significantly raised routine maintenance budget in 2014²⁷ to ensure the allocation

²⁴ For example, as regards repainting of road division line, DPWH will gradually introduce thermoplastic road marking machine (for reference, road marking used to be manually conducted), therefore maintenance manual will be revised accordingly, taking into account new technology.

²⁵ According to BOM, there is a special release fund, apart from the above four types of budget. Source of funds comes from investment cost saved as a result of bidding (differences between bidding price and expected price). The fund is not an annual budget but may be allocated to DEOs as needs arise (such as to cover large-scale rehabilitation work with particular attention) subject to BOM's scrutiny of budget requested from DEOs.

²⁶ Calculation formula for operation and maintenance costs based on EMK system is as follows.

Operation and maintenance cost = Basic Cost × EMK

Basic Cost: Cost required to operate and maintain one kilometer of road for one year. It is determined each year by BOM, considering the inflation rate of each cost item.

EMK: Index determined by pavement type, road width, and traffic volume.

EMK = [road length (km) × EMK index (differing by road type and width) × EMK index (differing by road type and traffic volume)] + [bridge length (m) × EMK index (differing by bridge type)]

²⁷ 67,422peso/EMK in 2012, 67,387peso/EMK in 2013, and 109,762peso/EMK in 2014.

commensurate with the operation and maintenance needs in the field. However, according to BOM, the increased allocation in 2014 would not cover accumulating defects from the past, and budget shortage still remains. In addition, BOM pointed out that there is no assurance for securing necessary budget for appropriate operation and maintenance, taking into account the accumulated defects from the past years.

2. MVUC is an allocation from a special road fund for maintenance established in 2003. As stated previously, labor costs for RMCs are covered partly from MVUC.

3. Calamity fund and 4. Emergency fund is the budget utilized in response to disaster and emergency situations, which is allocated from DPWH headquarters to relevant DEOs. (10% of routine maintenance budget, which each DEO request annually through respective Regional Offices is retained at DPWH headquarters – of which, half is used for calamity fund and the remaining half for emergency fund. DEOs need to request budget allocation from these funds, apart from requesting annual routine maintenance budget. The budget is not necessarily allocated because prioritization in accordance with the scale of disaster and degree of emergency is made for the actual allocation).

The recent DPWH road maintenance budget (actual allocation) is shown in Table 18.

Table 18: DPWH Road Maintenance Budget (Actual Allocation)

(Unit: 1,000 peso)

Budget	2010	2011	2012	2013	2014
1. GAA (General Fund) (including budget for routine maintenance)	2,000,000	4,000,000	4,000,000	4,000,000	6,589,715
2. MVUC	-	-	1,500,000	748,816	-

Source: DPWH BOM

Note: As regards calamity fund and emergency fund, 5% each of routine maintenance budget is retained for these funds.

According to the answers to the questionnaires from each DEO, it was pointed out that improvement was seen in budget allocation for necessary routine maintenance costs, however, it would not still adequately cover the accumulated budget shortfalls from the previous years. In addition, according to Antique DEO, where interview survey was conducted, difficulties on cash flow management are pointed out due to the delays of actual allocation (budget release) from DPWH headquarters to the DEO. In fact, it would be difficult for DEOs to use up the budget if actual allocation is made at later time of the fiscal year, and that the unused amount cannot be carried over to the following year for use. As a matter of fact, according to the interview survey with DPWH headquarters (Comptrollership and Financial Management Services), it turned out to be that much time

is spent to go through cumbersome approval process within DPWH headquarters. Actually, in order to allocate budget from DPWH headquarters to each DEO, approval from four offices²⁸ is required. Although efforts have been made to facilitate the approval process, Comptrollership and Financial Management Services mentioned that it would be only after the second quarter (April to June) of the fiscal year that the actual allocation would be made possible. In fact, improvement measures to streamline approval process within DPWH headquarters have been raised.

In addition, according to Capiz First and Second DEO, where interview survey was conducted, repair is necessary for road shoulders and slope protection in some sections of road due to the effects from super typhoon (Yolanda) which hit the area in November 2013. Although the DEOs have requested budget from calamity fund, they were not sure if actual allocation would be made at the time of ex-post evaluation. In case where budget is not allocated, DEOs would have to divert necessary funds from annual routine maintenance budget for the repair.

Furthermore, at DPWH headquarters, Equipment Re-fleeting Program, a 5 year program between 2011 and 2016, is being implemented by Bureau of Equipment, to purchase new heavy machineries (grader, power shovel, dump truck, and wheel loader) and vehicles (patrol car) necessary for disaster measures/repairs and maintenance work. These heavy machineries are to be deployed to Regional Offices so that DEOs under their supervision can utilize. However, BOM pointed out that new heavy machineries and vehicles are not sufficiently deployed due to budget shortage. In fact, it was confirmed that DPWH has not been able to replace old heavy machineries and vehicles for many years, and some of them were more than 30 years old. As such, according to Capiz First and Second DEO, DEOs borrow heavy equipments and vehicles from local contractors as needed, however, it was also pointed out that their timely procurement is sometimes difficult because needs for heavy equipments and vehicles arise from other DEOs around the same time.²⁹ Given the fact that timely and efficient procurement of heavy

²⁸ When allocating routine maintenance budget to DEOs from DPWH headquarters, preparation of application for budget (Memo for Release) is required by Department of Budget and Management, and its approval process is taking time. Based on the annual work plan prepared by each DEO, BOM drafts the Memo for Release, followed by review and approval from the Office of the DPWH Planning Service and the Office of the DPWH Secretary. After the approval, the Memo for Release is submitted to the Comptrollership and Financial Management Services, and then budget is released to DEOs in accordance with the DPWH internal procedures.

²⁹ According to BOM regarding policy direction of DPWH on operation and maintenance, while DPWH plans to further outsource the work, including procurement of heavy equipments and vehicles for national arterial roads, it should be considered from a long-term perspective. Reform would require change of mandate and responsibility of DPWH, change in mindset and the way of thinking of DPWH personnel as well as change of personnel organization, therefore, it cannot be pursued in a short time. (As regards rural roads, nothing is decided since reform is subject to institutional capacity and financial ability of LGUs.) Therefore, DPWH, aiming to advance reform gradually in a long run, has introduced Equipment Re-fleeting Program in 2011 to renew heavy machineries and vehicles and to directly manage operation and maintenance work in the face of a mountain of urgent operation and maintenance needs. (Refer to Column for DPWH's

equipments has been hindered, executing agency should renew and retain them to be prepared for possible disasters, although they may not be necessary for routine maintenance.

Based on the above, at the time of ex-post evaluation, there is concern in terms of financial aspect of operation and maintenance considering that (i) assurance is lacking for securing necessary budget for appropriate operation and maintenance, taking into account of the budget for accumulated defects from the past years, (ii) difficulties on cash flow management for DEOs are pointed out due to the delays of actual budget allocation from DPWH headquarters to DEOs, and (iii) old heavy machineries and vehicles have not been renewed for many years due to budget shortage.

3.5.4 Current Status of Operation and Maintenance

According to the interview with DEOs and their answers to the questionnaires, their task and frequency of operation and maintenance of roads and bridges are as follows.

- Side ditch and drainage cleaning (as need arises)
- Vegetation control (as need arises)
- Sealing of cracks and potholes on road pavement (as need arises)
- Reshaping of unpaved road shoulders (as need arises)
- Application of concrete epoxy of precast concrete pavement (PCCP) blocks with scaling (monthly)
- Maintenance of traffic signs and guardrail (quarterly)
- Repainting of road division line (quarterly)
- Emergency repair in case problems occur such as slope protection (promptly)
- Preventive maintenance³⁰ (every 5 years)

According to a result of interview survey and questionnaire survey of DEOs, operation and maintenance works (routine, periodic, remedial, and preventive maintenance) have been conducted in accordance with the annual work plan prepared by DEOs. The road conditions for three sections visited during the field study were as follows. Although prompt repair is desired in some places, it can be judged that the road conditions are generally satisfactory.

- Maayon-Cuartero-Jct. Iloilo/Capiz Road: Due to the effects from the super typhoon (typhoon name: Yolanda) that hit the area in November 2013, repair of road shoulder

road sector asset management system.)

³⁰ DPWH has introduced road management analysis tool called “HDM-4” (Highway Development and Management) for the country’s entire road network. It is a system that enables to predict and extract road sections that need maintenance as well as repairs in the future, based on the past road usage record and current maintenance activities. As for preventive maintenance, based on HDM-4, road pavement and overlay are conducted where road degradation is expected.

and slope protection work is necessary in a small section.

- Pandan-Libertad-Antique/Aklan Bdry: Repair of road shoulder is necessary in a small section.
- Bdry. Antique/Iloilo – Anini-y – V. Jimenez Road: Cracks occurred on the approach road of Bongalonan Bridge, developed as part of another Japanese ODA loan project (Urgent Bridges Construction Project for Rural Development), due to ground subsidence. After the bridge was transferred to DPWH in July, 2014, the DEO is responsible for ground settlement work of approach road. Additional budget necessary for remedial measures (15 million pesos) have already been allocated from 2014 budget to the DEO.

As regards spare parts necessary for road and bridge maintenance, except for during an emergency, items above 50,000 pesos are procured by inviting local suppliers for bid, however, the procurement takes time for some types of spare parts. Nonetheless the situation cannot be regarded as critical problems.

Column: DPWH's Road Sector Asset Management System

DPWH is aiming for an effective and efficient management of road assets, and has commissioned “Comprehensive Road Maintenance Program” to private sector to implement maintenance work for national arterial roads on a project basis – for foreign funded road projects after preparing maintenance program. (According to BOM, among the country's total length of national arterial road of about 31,500km, little less than 4%, i.e., approximately 1,200km is covered by this program.)

The World Bank is taking the lead of this program through its on-going “National Roads Improvement and Management Program Phase 2 (NRIMP 2)” (program period: 2008-2014), with four road sections – South Luzon package, Mindoro East Coast package, Panay Island package, and Negros Island package –outsourcing its maintenance to private sector. JICA, also through its “Road Upgrading and Preservation Project”, is providing support to DPWH to utilize private sector for maintenance work. The program is consistent with DPWH strategy to outsource maintenance work, and according to BOM, DPWH is aiming to institutionalize this initiative, beyond current project basis, in the future. However, it is unclear whether this initiative will be expanded to rural roads since it entails institutional capacity and financial ability of LGUs.

Some problems have been observed in terms of the financial aspects of the maintenance. Therefore sustainability of the project effect is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project improved national secondary roads with the aim of securing safe and efficient transport on the rural road network in the surrounding areas. The project objective – to ensure safe and efficient transport by enhancing quality of the rural road network, thereby contributing to the development of the local economies and to redress the economic disparity between rural and urban areas – is consistent with the development policy of the Philippines and with the development needs both at the time of the appraisal and ex-post evaluation, as well as Japan's ODA policy at the time of appraisal; thus, the relevance of the project is high. AADT far exceeded the target and VOC was reduced significantly after the completion of the targeted road sections. In addition, the results of interview and beneficiary survey in the field have shown local residents' satisfaction with the benefit of the project (improvement of certainty/reliability of road network, enhancement of market access, and promotion of transport efficiency). Furthermore, the project is also contributing to the increase of income of local residents and activation of local economic activities; thus, the project's effectiveness and impact are high. On the other hand, the project cost exceeded the plan and the project period was significantly longer than planned; thus, efficiency is low. As regards operation and maintenance, old heavy machineries and vehicles have not been replaced adequately due to insufficient budget; thus, sustainability of the project is fair.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

- Importance of renewing and securing heavy machineries and vehicles for operation and maintenance works

Aging heavy machineries and vehicles have become obstacles for carrying out timely and appropriate operation and maintenance work. DPWH Bureau of Equipment has been purchasing and deploying new heavy machineries and vehicles to Regional Offices so that DEOs under their supervision can utilize them, however, they are not sufficiently allocated due to budget shortage. DEOs have been borrowing heavy equipments and vehicles from local contractors as needed, however, their timely procurement is difficult in some cases. While operation and maintenance budget for 2014 was greatly increased (costs for purchasing heavy equipments and vehicles are covered by this budget), it is

important that DPWH further secures budget to renew heavy equipments and vehicles in order to strengthen sustainability of the project.

- Importance of preparing repair plans and securing budget for expected future large-scale repair and rehabilitation

In addition to preparing routine/periodic maintenance work plan (annual work plan), DPWH should be prepared for major repair and rehabilitation in the future including preparation for the budget plans. While it is unnecessary in the current state, still in the early period after project completion, DEOs will need to request additional budget to DPWH headquarters (BOM) in case of need for major repairs in the future because it is not realistic for them to carry out major repairs using the annual budget. Therefore, it is important that BOM further secures special release fund and emergency fund so that timely allocation to DEOs will be realized.

- Importance of timely budget release from DPWH headquarters to DEOs

As pointed out by DEOs regarding difficulties on their cash flow management caused by the delays of actual allocation of routine maintenance budget from DPWH headquarters to DEOs, it is recommended that DPWH takes measures to streamline approval process within the headquarters to release budget at an early stage of the fiscal year (within the first quarter: January to March, for example) to meet the needs of DEOs. At the central level, Department of Budget and Management has already carried out reform to facilitate budget release from GAA to DPWH – budget is released to DPWH soon as budget for the Philippine government is approved (therefore, by early January, the beginning of a fiscal year, budget is already released from GAA to DPWH). On the other hand, approval process is taking time within DPWH headquarters due to time-consuming procedures – after BOM drafts the Memo for Release, review and approval from the Office of the DPWH Planning Service and the Office of the DPWH Secretary are required before the Comptrollership and Financial Management Services releases budget to DEOs (refer to the footnote in page 30). In fact, necessity for streamlining the process within DPWH headquarters has been raised. It is proposed that BOM should directly submit the Memo for Release to Comptrollership and Financial Management Services for approval (without involvement of DPWH Planning Service and the Office of the DPWH Secretary), and make sure the budget is released promptly to DEOs upon approval. Therefore, it is important to facilitate budget release process by strengthening BOM's responsibility and enhancing its accountability mechanism.

4.3 Lessons Learned

- Importance of institutionalizing advance procurement system

One of the major reasons for delay of road and bridge projects in the Philippines has been the delay in selection process of consultants and contractors. This is an issue applicable not only to this project but many other road and bridge projects which DPWH has implemented in the past. In order to cope with the situation, DPWH and JICA have been promoting advance procurement system. Specifically, this project facilitation initiative goes like this: as soon as pledge (Japanese Government announcing to the Philippine government its intention to provide Japanese ODA loan with a concrete amount) is made, DPWH immediately starts selection process of consultants who would undertake detailed design work. Once a loan agreement is signed between JICA and DPWH, and the loan agreement becomes effective, consultants for detailed design is awarded (subject to JICA concurrence), enabling consultants to commence their work within less than six months after the conclusion of a loan agreement. By introducing advance procurement, selection of civil works contractors, selection of consultants for construction supervision, and preparation of right-of-way acquisition can take place in parallel process with the detail design stage, thereby expediting the entire project implementation. In fact, advance procurement has already been introduced in “Central Luzon Link Expressway Project” and “Arterial Road Bypass Project (2)” (both are Japanese ODA loan projects), and their tendering process seems to be on track to this point. So far, this good practice has been introduced on an individual project basis, but if it can be applied to the whole DPWH road and bridge projects, more efficient implementation of the project is expected in the entire DPWH road sector.

- Importance of local residents’ participation in routine/periodic maintenance work

In this project, site workers in charge of routine/periodic maintenance work for roads and bridges are employed from the local residents as RMCs, with supervision of DPWH. This initiative facilitates local participation in maintenance work, employment creation for local residents and increases efficiency of maintenance work. Especially, the employment of RMCs from the poor household, an initiative as a result of collaboration between DPWH and DSWD, is regarded as part of social welfare. It is expected that such cross-ministerial initiatives will be strengthened in the future. But there is room for further improvement. Currently, RMCs employed from poor households are in charge of basic maintenance operations such as cleaning and vegetation control, which makes it difficult for them to acquire skills that can be utilized for their successive jobs after the employment period. As such, it is recommended that trainings to be provided to them within the three months employment period so that RMCs can acquire skills (such as

repainting of road division line and sealing of cracks and potholes on road pavement) to support their livelihood. In this way, the initiative will become even more useful from the perspective of “facilitating measures for poverty reduction”.

Reference:

Vehicle Operating Costs (VOC) Savings

(Unit: million peso / year)

Road Section / Province (Completion Month and Year)	Baseline	Target		Actual		
	2001	Completion Year	7 years after Completion	2011	2012	2013 (Note 1)
1.Batac-Jct. Banna (Espiritu)-Nueva Era Road / Ilocos Norte (Sept.2010)	-	8.66	13.94	442.66	385.71	536.79
2.Solano-Quezon Road / Nueva Vizcaya (Mar. 2010)	-	7.63	11.71	59.40	N.A. (Note 2)	N.A. (Note 2)
3.Baliwag Bdry.-Candaba Road / Pampanga (Dec. 2008)	-	9.70	12.85	1,246.84	2,118.99	1,615.28
4.San Juan-Laiya Road / Batangas (Feb.2009)	-	32.78	52.50	N.A. (Note 2)	1,154.97	637.81
5.Libon-Marocmoc-Pantao Road / Albay (Sep.2009)	-	10.37	13.98	291.66	400.48	791.87
6.Looc-Odiongan-San Andres Road / Romblon (Jun.2010)	-	27.82	45.24	1,315.83	2,250.86	2,529.90
7.Pandan-Libertad-Antique/A klan Bdry/ Antique (Jun.2012)	-	27.28	41.24	311.12	424.32	487.57
8.Bdry. Antique/Iloilo – Anini-y – V. Jimenez Road / Antique (Mar.2012) (Note 3)	-	-	-	532.36	518.42	883.44
9.Maayon-Cuartero-Jct. Iloilo/Capiz Road / Capiz (Oct.2009)	-	24.60	40.20	909.71	1,062.37	1,147.04
10.Butuan City-Las Nieves-Esperanza-Bayugan Road / Agusan del Sur and Agusan del Norte (Aug.2012)	-	51.24	71.69	1,349.16	2,071.52	2,343.81
11.Prospiedad-Lianga Road / Agusan del Sur and Surigao del Sur (Nov.2010)	-	36.35	55.15	378.27	418.66	463.26

Source: DPWH Planning Section

Note 1) The completion year of the entire project is 2013.

Note 2) N.A. because AADT data on the concerned road section has not been collected.

Note 3) 8.Bdry. Antique/Iloilo – Anini-y – V. Jimenez Road was added to the scope after the project was started.

Note 4) AADT is included in the VOCS calculation formula.³¹ As AADT and VOCS have positive correlation, the larger AADT, the larger VOCS.

³¹ According to the executing agency, the calculation formula for VOCS is as follows.

$$\text{VOCS} = [\text{AADT} \times \text{BVOCd} (\text{peso}/(\text{km} \cdot \text{vehicle})) \times \text{distance of the road section (km)} \times 365] + [\text{AADT} \times \text{BVOCt} (\text{peso}/(\text{minute} \cdot \text{vehicle})) \times \text{travel time of the road section (minute)} \times 365]$$

*BVOC: Basic Vehicle Operating Cost, “d” stands for distance, “t” stands for time

The executing agency has set specific figures for BVOCd and BVOCt, respectively, in accordance with travel speed and types of vehicles. (At the time of ex-post evaluation, the actual VOCS was calculated on the basis that travel speed is 60km/hour. In addition, average figures for all the vehicle types were applied for both BVOCd and BVOCt.)

The assumptions which the executing agency set out at the time of appraisal for calculating VOCS targets were as follows (source: DPWH Pre-F/S (May, 1997)). Both BVOCd and BVOCt figures were lower than the figures used to calculate the actual VOCS. (The actual VOCS was calculated using the data provided by the executing agency, dated August, 2008). AADT targets were also lower than the actual AADT.

- BVOCd at the time of appraisal: Average of 3.85, BVOCd used to calculate the actual VOCS: Average of 17.59
- BVOCt at the time of appraisal: Average of 1.11, BVOCt used to calculate the actual VOCS: Average of 5.44

Attachment:

< Data on Agricultural Production >

Changes in Palay Production in Project Targeted Provinces and the Entire Country

(Unit: ton)						
Province	2008	2009	2010	2011	2012	2013
Ilocos Norte (Sept. 2010)	299,984	256,582	301,934	306,726	315,712	318,444
Nueva Vizcaya (Mar. 2010)	232,946	231,284	200,572	218,446	241,956	253,755
Pampanga (Dec. 2008)	398,910	332,972	393,328	310,456	388,187	419,721
Batangas (Feb. 2009)	60,218	55,800	53,423	49,569	43,206	52,198
Albay (Sep.2009)	161,391	170,564	182,472	201,037	206,808	220,980
Romblon (Jun.2010)	29,190	32,275	31,841	35,482	35,866	32,479
Antique (Mar. and Jun.2012)	244,354	250,913	211,466	287,036	273,468	286,622
Capiz (Oct.2009)	318,134	373,982	335,608	349,094	360,914	322,388
Agusan del Norte (Aug.2012)	90,515	76,015	68,070	70,835	73,595	95,434
Agusan del Sur (Nov. 2010 and Aug. 2012)	197,568	176,877	175,333	195,010	240,381	305,171
Surigao del Sur (Nov.2010)	84,024	90,528	91,888	80,380	84,550	106,585
Total palay production in 11 provinces	2,117,234	2,047,792	2,045,935	2,104,071	2,264,643	2,413,777
Growth rate of palay production in 11 provinces (%)	2.84	-3.28	-0.09	2.84	7.63	6.59
Total palay production in the Philippines	16,815,548	16,266,417	15,772,319	16,684,062	18,032,422	18,439,406
Growth rate of total palay production in the Philippines (%)	3.54	-3.27	-3.04	5.78	8.08	2.26

Source: Bureau of Agricultural Statistics

Note) Parentheses after each Province indicate the completion month and year of targeted road section

According to the executing agency, it is recommended that BVOC be revised every three to five years, however, there seems to be no rule for the revision. As a matter of fact, revisions have been made in the past when variables for calculating BVOC (such as vehicle value, overhead cost such as registration fee, fuel price, labor cost etc.) significantly fluctuated or reform of the tax system took place. According to the executing agency, although calculation method (basic assumptions) for coming up with BVOC have not changed at the time of ex-post evaluation (using 2008 version) and at the time of appraisal, the actual VOCS greatly increased because the figures for each variable have significantly changed since the appraisal.

Changes in Corn Production in Project Targeted Provinces and the Entire Country

(Unit: ton)						
Province	2008	2009	2010	2011	2012	2013
Ilocos Norte (Sept. 2010)	58,574	58,368	53,553	52,157	53,698	55,731
Nueva Vizcaya (Mar. 2010)	57,769	63,354	43,389	58,966	66,705	59,488
Pampanga (Dec. 2008)	53,137	50,554	49,447	47,478	49,021	54,331
Batangas (Feb. 2009)	20,030	20,228	24,280	21,187	15,323	22,918
Albay (Sep.2009)	48,481	54,951	49,391	51,500	57,556	59,436
Romblon (Jun.2010)	766	1,112	939	728	758	730
Antique (Mar. and Jun.2012)	8,942	9,864	1,720	4,749	5,502	4,538
Capiz (Oct.2009)	58,693	57,930	41,550	47,083	50,798	52,658
Agusan del Norte (Aug.2012)	17,991	7,202	8,907	9,750	9,840	13,018
Agusan del Sur (Nov. 2010 and Aug. 2012)	69,516	67,355	77,849	60,357	70,673	82,921
Surigao del Sur (Nov.2010)	11,032	12,284	6,470	4,646	8,267	10,422
Total corn production in 11 provinces	404,931	403,202	357,495	358,601	388,141	416,191
Growth rate of corn production in 11 provinces (%)	-6.33	-0.43	-11.34	0.31	8.24	7.23
Total corn production in the Philippines	6,928,225	7,034,033	6,376,796	6,971,221	7,406,830	7,377,076
Growth rate of total corn production in the Philippines (%)	2.84	1.53	-9.34	9.32	6.25	-0.40

Source: Bureau of Agricultural Statistics

Note) Parentheses after each Province indicate the completion month and year of targeted road section

< Data on Business Activities >

Number of Establishments and Employments in Project Targeted Provinces and the Entire Country

Province	2008	2009	2010	2011	2012
Ilocos Norte (Sept. 2010)	6,275	6,277	6,282	6,603	7,337
	21,091	21,274	20,991	21,805	29,329
Nueva Vizcaya (Mar. 2010)	4,406	4,406	4,394	3,885	4,416
	13,598	13,471	13,870	12,180	16,233
Pampanga (Dec. 2008)	18,949	19,232	19,113	20,730	25,409
	129,522	140,256	139,647	147,772	190,001
Batangas (Feb. 2009)	19,675	19,909	19,853	20,512	22,668
	119,846	120,704	122,805	140,118	179,294
Albay (Sep.2009)	6,323	6,391	6,382	6,347	8,058
	37,034	36,076	35,690	37,270	47,615
Romblon (Jun.2010)	1,634	1,767	1,762	1,637	1,990
	4,072	4,426	4,254	3,922	6,373
Antique (Mar. and Jun.2012)	2,901	2,949	2,953	3,352	3,920
	9,141	10,270	8,963	12,639	16,291
Capiz (Oct.2009)	4,666	4,663	4,658	5,090	5,834
	19,137	17,972	17,962	20,443	25,428
Agusan del Norte (Aug.2012)	4,698	4,699	4,693	5,317	4,035
	27,518	27,601	28,258	31,456	19,496
Agusan del Sur (Nov. 2010 and Aug. 2012)	2,929	2,953	2,952	3,491	4,035
	9,728	9,923	10,125	11,656	19,496
Surigao del Sur (Nov.2010)	2,525	2,530	2,534	2,644	4,221
	12,237	10,075	10,224	11,539	21,694
Number of establishments in 11 provinces	74,981	75,776	75,576	79,608	91,923
Growth of number of establishments in 11 provinces (%)	-4.42	1.06	-0.26	5.34	15.47
Number of total employment in 11 provinces	402,924	412,048	412,789	450,800	571,250
Growth rate of number of total employment in 11 provinces (%)	6.43	2.26	0.18	9.21	26.72
Number of establishments in the Philippines	761,409	780,505	777,687	820,255	944,897
Growth rate of number of establishments in the Philippines (%)	-2.87	2.51	-0.36	5.47	15.20
Number of total employment in the Philippines	5,544,590	5,691,110	5,669,297	6,345,742	7,589,591
Growth rate of Number of total employment in the Philippines (%)	6.88	2.64	-0.38	11.93	19.60

Source: National Statistics Office

Note 1) Upper figures for each province: number of establishments, lower figures for each province: number of employment

Note 2) Parentheses after each Province indicate the completion month and year of targeted road section

Comparison of the Original and Actual Scope of the Project

Item	Original	Actual
1. Project Outputs	<p>1) Civil Engineering Work</p> <p>1. Batac-Jct. Banna (Espiritu)-Nueva Era Road: Road (12.19km)</p> <p>2. Solano-Quezon Road: Road (8.15km), Bridge (3)</p> <p>3. Baliwag Bdry.-Candaba Road: Road (5.55km), Bridge (1)</p> <p>4. San Juan-Laiya Road: Road (9.80km), Bridge (4)</p> <p>5. Libon-Marocmoc-Pantao Road: Road (16.45km), Bridge (3)</p> <p>6. Looc-Odiongan-San Andres Road: Road (37.26km)</p> <p>7. Pandan-Libertad-Antique/Aklan Bdry: Road (27.10km), Bridge (13)</p> <p>8. Maayon-Cuartero-Jct. Iloilo/Capiz Road: Road (41.35km), Bridge (1)</p> <p>9. Butuan City-Las Nieves-Esperanza-Bayugan Road: Road (59.26km), Bridge (2)</p> <p>10. Prosperidad-Lianga Road: Road (21.15km), Bridge (2)</p> <p>2) Consulting Services</p> <ul style="list-style-type: none"> Detailed design, assistance in tendering, construction supervision of the project Transfer of technology to executing agency staffs regarding operation and maintenance Environmental monitoring necessary for environmental consideration and to comply with ECC requirement Assistance to the executing agency for the coordination with provincial government concerned 	<p>1) Civil Engineering Work</p> <p>1. Batac-Jct. Banna (Espiritu)-Nueva Era Road: Road (12.21km)</p> <p>2. Solano-Quezon Road: Road (8.15km), Bridge (1)</p> <p>3. Baliwag Bdry.-Candaba Road: Road (2.10km), Bridge (0)</p> <p>4. San Juan-Laiya Road: Road (23.10km), Bridge (1)</p> <p>5. Libon-Marocmoc-Pantao Road: Road (16.45km), Bridge (0)</p> <p>6. Looc-Odiongan-San Andres Road: Road (37.26km), Bridge (6)</p> <p>7. Pandan-Libertad-Antique/Aklan Bdry: Road (27.76km), Bridge (12)</p> <p>8. Bdry. Antique/Iloilo – Anini-y – V. Jimenez Road: Road (29.95km), Bridge (5)</p> <p>9. Maayon-Cuartero-Jct. Iloilo/Capiz Road: Road (41.45km), Bridge (1)</p> <p>10. Butuan City-Las Nieves-Esperanza-Bayugan Road: Road (59.26km), Bridge (4)</p> <p>11. Prosperidad-Lianga Road: Road (21.15km), Bridge (2)</p> <p>2) Consulting Services</p> <p>Necessary tasks have been implemented as planned, however, the services were targeted to 4 road sections, and the rest of the 7 sections were managed directly by the executing agency utilizing GOP fund.</p>
2. Project Period	March, 2001 - October, 2006 (68 months)	May, 2001 - December, 2013 (152 months)
3. Project Cost Amount paid in Foreign currency	5,097 million yen	4,540 million yen

Amount paid in Local currency	3,176 million yen (1,134 million pesos)	5,870 million yen (3,057 million pesos)
Total	8,273 million yen	10,410 million yen
Japanese ODA loan portion	6,205 million yen	4,540 million yen
Exchange rate	1 peso = 2.8 yen (As of January, 2000)	1 peso = 1.92 yen (Average between 2002 to 2011)

[END]

Republic of the Philippines

Ex-Post Evaluation of Japanese ODA Loan
“Urgent Bridges Construction Project for Rural Development”

External Evaluator: Masumi Shimamura
Mitsubishi UFJ Research and Consulting Co., Ltd.

0. Summary

This project improved, replaced, and constructed bridges on national roads that lead to urban centers with the aim of securing safe and efficient distribution in the surrounding areas. The project objective – to improve road network for safe and efficient transport, contributing to the development of regional economies as well as to redress the economic disparity by enhancing quality of bridges in rural areas through replacing Bailey bridges¹ with permanent bridges² – is consistent with the development policy of the Philippines and with the development needs both at the time of the appraisal and ex-post evaluation, as well as Japan’s ODA policy at the time of appraisal; thus, the relevance of the project is high. Annual average daily traffic of bridges selected for monitoring mostly exceeded the target, and number of days of traffic interruption in case of bridge collapse as well as reduction of detour distance in case of bridge collapse became zero, respectively, after the completion. In addition, the results of interview and beneficiary survey in the field have shown local residents’ satisfaction with the benefit of the project (improvement of accessibility and safety of bridges, enhancement of market access, and promotion of transport efficiency). Furthermore, the project is also contributing to the activation of local economic activities, reduction of poverty and economic disparity, and improvement of local farmers’ livelihood; thus, the project’s effectiveness and impact are high. On the other hand, the project cost exceeded the plan and the project period was significantly longer than planned; thus, efficiency is low. As regards operation and maintenance, old heavy machineries and vehicles have not been replaced adequately due to insufficient budget; thus, sustainability of the project is fair.

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

¹ Temporary bridges constructed in a short time in order to secure passage in the immediate future.

² Bridges made of steel and concrete, not wooden bridges.

1. Project Description



Project Location
(Total of 137 Bridges Nationwide)



Culasi Bridge
(Panay Island, Iloilo Province)

1.1 Background

In the Philippines, roads provide the principal means of transport, accounting for around 90% of the passenger transport and approximately 50% of the freight transport at the time of appraisal (2002). Looking at the state of bridges, many aging Bailey bridges were being used and permanent bridges, too, were crumbling, breaking down, and deteriorating due to such factors as inadequate maintenance, the increase in overloaded vehicles and traffic volume, and the effect of natural disasters. With disasters like frequent typhoons, the road network was also in danger of severance as bridges were washed away or collapse. Because of these factors, the local regions hardly had a safe and efficient road network. Thus urgent steps were required to develop safe and efficient transport on the arterial road network in order to promote the interchange of people and distribution of goods within the nation and support the development of urban regions. As such, this project, aiming to improve, replace and construct bridges on national roads was given high priority. Selection of bridges for this project was made based on the list of 887 bridges, which the Department of Public Works and Highways (hereinafter referred to as “DPWH”), the executing agency of the project, had prepared. Flowchart, taking into consideration requirements such as development needs, expected benefits, required technology, condition of bridges, was utilized to narrow down to 201 bridges of high relevance for this project.

1.2 Project Outline

The objective of the project is to ensure safe and efficient distribution by improving, replacing and constructing bridges on national roads that lead to urban centers all over the

country, thereby contributing to the development of regional economies.

Loan Approved Amount/ Disbursed Amount	18,488 million yen / 18,332 million yen
Exchange of Notes Date/ Loan Agreement Signing Date	March, 2002 / March, 2002
Terms and Conditions	<p>【Main Construction】 Interest Rate: 0.95%, Repayment Period: 40 years (Grace Period: 10 years), Condition for Procurement: Tied</p> <p>【Consulting Service】 Interest Rate: 0.75%, Repayment Period: 40 years (Grace Period: 10 years), Condition for Procurement: Bilateral Tide</p>
Borrower / Executing Agency	The Government of the Philippines / The Department of Public Works and Highways (DPWH)
Final Disbursement Date	September, 2011
Main Contractor (Over 1 billion yen)	<ul style="list-style-type: none"> • Tobishima Corporation (Japan) / Toyo Construction (Japan) (JV) • Miyaji Iron Works Co.(Japan) / Nippon Steel Corporation (Japan) / Toyo Construction (Japan) (JV)
Main Consultant (Over 100 million yen)	Dainichi Consultant Inc.(Japan) / Katahira and Engineers International (Japan) / Sogo Engineering, Inc.(Japan) / Development Engineering and Management Corp, Techphil Inc.(the Philippines) / Design Science Incorporated (the Philippines) / TCGI Engineers (the Philippines) / DCCD Engineering Corporation (the Philippines) / Perk Technical Consultants Corporation(the Philippines) (JV)
Feasibility Studies, etc.	<ul style="list-style-type: none"> • DPWH Nationwide Bridge Study and Pre-F/S (1995) • DPWH Implementation Program (I/P) (July, 1999) • DPWH I/P Revision (May, 2000) • JICA SAPROF (Special Assistance for Project Formation) (July - October, 2001)
Related Projects	Japanese ODA Loan (Loan Agreement signing year and month in parentheses)

	<ul style="list-style-type: none"> • Rehabilitation & Maintenance of Bridges Along Arterial Road (I) (February, 1990) • Rehabilitation & Maintenance of Bridges Along Arterial Road (II) (July, 1991) • Rehabilitation & Maintenance of Bridges Along Arterial Road (III) (December, 1994) • Rehabilitation & Maintenance of Bridges Along Arterial Road (IV) (December, 1999) • Rural Road Network Development Project (III) (May, 2001) • Road Upgrading and Preservation Project (March, 2011) <p>Technical Cooperation</p> <ul style="list-style-type: none"> • Improvement of Quality Management for Highway and Bridge Construction and Maintenance Phase 1, 2 (Phase 1: February, 2007 – February, 2010, Phase 2: October, 2011 – September, 2014) <p>Grant Aid</p> <ul style="list-style-type: none"> • Project for Constructing Bridges Along Rural Roads (Exchange of Notes signing year and month in parentheses) <p>Phase 1 (April, 1988)</p> <p>Phase 2 (October, 1988)</p> <p>Phase 3 (April, 1990 and February, 1992)</p> <p>Phase 4 (January, 1993 and July, 1993)</p> <p>World Bank</p> <ul style="list-style-type: none"> • National Roads Improvement and Management Program Phase 2 (NRIMP 2) <p>Asian Development Bank</p> <ul style="list-style-type: none"> • Road Improvement and Institutional Development Project
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2. Outline of the Evaluation Study

2.1 External Evaluator

Masumi Shimamura, Mitsubishi UFJ Research and Consulting Co., Ltd.

2.2 Duration of Evaluation Study

Duration of the Study: November, 2013 – December, 2014

Duration of the Field Study: March 16–April 14, 2014, June 25–July 9, 2014

3. Results of the Evaluation (Overall Rating: C³)

3.1 Relevance (Rating: ③⁴)

3.1.1 Relevance to the Development Plan of the Philippines

At the time of appraisal, the “Medium-Term Development Plan (2001-2004)” formulated under the Arroyo Administration, stated the “delivery of safe and reliable transportation services for supporting the social and economic development of the Philippines” as one of the development objectives in the transportation sector. Specifically, the government set the target that national bridges should be 95% permanent by 2004 (89% permanent as of 2000), and considered as necessary task to replace temporary bridges⁵ (total length: 16,612m), improve existing bridges (total length: 36,494m), and develop new bridges (total length: 4,211m) to achieve the target.

At the time of ex-post evaluation, the “Mid-Term Development Plan (2011-2016)” prioritized development of road and bridge infrastructures which reduce transportation cost and thereby activate economic activities. The Plan emphasized the maintenance of existing transport infrastructure and transport network, by prioritizing resource allocation including budget, personnel and equipments.

In addition, DPWH developed its “Mid-Term Development Plan (2011-2016)”, which highlighted the “strategic development of transport infrastructures as well as maintenance and management of transport infrastructures”. The Plan emphasized the maintenance and enhancement of existing road network, together with further network expansion, based on following priority.

1. Maintenance of existing transport infrastructures (roads and bridges)
2. Repair and rehabilitation of damaged portions
3. Widening and improvement of heavily trafficked sections
4. Development of new roads and missing links⁶

3.1.2 Relevance to the Development Needs of the Philippines

As mentioned in “1.1 Background”, at the time of appraisal, improving quality of the existing transport infrastructures through development of unpaved roads and replacement

³ A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

⁴ ③: High, ②: Fair, ①: Low

⁵ Bridges built temporarily on the detour in order to replace existing bridges by permanent bridges on the original road, bridges built for vehicles for civil work along the construction road, and bridges built to be used temporarily at the time of disaster such as flood and earthquake.

⁶ Unpaved road sections within the road network. Road sections where the network is interrupted.

of Bailey bridges by permanent bridges was urgent necessity. Therefore, this project, aiming to improve, replace and construct bridges on national roads was given high priority.

At the time of ex-post evaluation, DPWH emphasized the importance of enhancing quality and capacity of existing road and bridge infrastructures, and set its numerical targets as follows to realize its goal.

- 97% of national arterial roads should be paved by 2016 (88% paved as of December, 2012)
- 88% of national secondary roads should be paved by 2016 (65% paved as of December, 2012)
- Entire national bridges along national roads should become permanent bridges by 2016

While the total number of bridges developed by the project was reduced from 201 (plan) at the time of appraisal to 137 (actual) in the end, DPWH has expressed its intention to develop all the remaining bridges utilizing other sources of funds.⁷ Therefore, the high necessity to develop national bridges remains unchanged. (Refer to the “Project Outputs” under “Efficiency” in later discussion.)

3.1.3 Relevance to Japan’s ODA Policy

In December 1999 Japan International Cooperation Agency (hereinafter referred to as “JICA”) prepared the “Medium-Term Strategy for Overseas Economic Cooperation Operations” based on the Japan’s assistance policy. In this document the following fields were listed as priorities: (1) “making economies more resilient while overcoming constraints in order to achieve sustainable growth”; (2) “poverty alleviation and correction of regional disparities”; (3) “environmental protection including disaster prevention as well as disaster prevention measures”; and (4) “human resource development and system building.” Out of these priorities, the project corresponds to “(1) making economies more resilient while overcoming constraints in order to achieve sustainable growth” and “(2) poverty alleviation and correction of regional disparities”.

This project has been highly relevant to the country’s development plan, development needs, as well as Japan’s ODA policy. Therefore its relevance is high.

⁷ DPWH and JICA confirmed this point when taking procedures for extending loan disbursement period. Since the final disbursement date, DPWH and JICA have been following up the progress of developing the remaining bridges at the PIR (Project Implementation Review) meetings, which are held twice a year.

3.2 Effectiveness⁸ (Rating: ③)

3.2.1 Quantitative Effects (Operation and Effect Indicators)

Table 1 shows the status of 10 sample bridges⁹ selected at the time of appraisal. Because changes of sources of fund and project scope (changes of bridges included in this project) took place, bridges subject to monitoring were sorted out as per indicated in the reference in the table below (refer to Project Outputs under “Efficiency” for background of the changes).

Table 1: Status of 10 Sample Bridges (Actual)

Name of the Bridge (Region) (Note 1)	Status	Reference
1. Bangcag (CAR)	Developed by this project (Package 1).	Regarded as one of the bridges subject to monitoring of operation and effect indicators in this report.
2. Amburayan (I)	Developed by this project (Package 1).	Regarded as one of the bridges subject to monitoring of operation and effect indicators in this report.
3. Pantal (I)	Developed by this project (Package 3).	Regarded as one of the bridges subject to monitoring of operation and effect indicators in this report.
4. Quirino (I)	Developed by this project (Package 1).	Regarded as one of the bridges subject to monitoring of operation and effect indicators in this report.
5. Mabbang 2 (II)	Developed by this project (Package 2) using GOP ¹⁰ fund.	Regarded as one of the bridges subject to monitoring of operation and effect indicators in this report.
6. Payapa (IV-A)	Developed by this project (Package 3).	Regarded as one of the bridges subject to monitoring of operation and effect indicators in this report.
7. Rangas3 (V)	Developed by this project (Package 3).	Regarded as one of the bridges subject to monitoring of operation and effect indicators in this report.
8. Embarcadero (VI)	Deleted from this project and developed using GOP fund. Culasi Bridge (Region VI) was added to this project instead and developed under Package 4.	Data regarding Embarcadero Bridge is regarded as reference in this report because the bridge was deleted from the project. Data regarding Culasi Bridge is also regarded as reference in this report. The bridge was not initially selected as a sample bridge and was later added to the project scope, but actual data was available from the executing agency.
9. Lao-ang 1 (VIII)	Deleted from this project and development not	Lao-ang 1 Bridge was deleted from this project due to soaring construction cost. The bridge was deleted from monitoring because development

⁸ Sub-rating for Effectiveness is to be put with consideration of Impact.

⁹ This project intended to develop a large number of bridges, which made it inefficient to obtain data for all bridges. Therefore, at the time of appraisal, 10 representative bridges were selected for monitoring operation and effect indicators.

¹⁰ Government of the Philippines

	realized at the time of ex-post evaluation. Sinedab Bridge (Region I) was added to this project instead and developed under Package 4 using GOP fund.	had not been realized at the time of ex-post evaluation and existing bridge was still used. Data regarding Sinedab Bridge is regarded as reference in this report. The bridge was not initially selected as a sample bridge and was later added to the project scope, but actual data was available from the executing agency. For reference, Sinedab Bridge is located on Suyo-Cervantes-Mankayan-Abatan Road Section developed by ODA loan: Arterial Road Links Development Project (V).
10. Malitbog (X)	Deleted from this project and developed using GOP fund	Data regarding Malitbog Bridge is regarded as reference in this report. The bridge was initially selected as a sample bridge but deleted from this project.

Note 1) Regions where respective bridges are located are indicated in parentheses

3.2.1.1 Annual Average Daily Traffic (vehicle/day)

Table 2 shows the baselines and targets concerning annual average daily traffic (hereinafter referred to as “AADT”) volume as well as the actual data for the recent years. It should be noted that completion month and year of each bridge varies, and 1-5 years have already passed as of 2013, when all recent actual data were available. While the recent actual data for “2. Amburayan Bridge” and “4. Quirino Bridge” in 2011, 2012, and 2013 are lower than the baselines (2001) and targets set forth at the time of appraisal, the actual AADT volume for the rest of the bridges exceeds the target. Especially, the actual AADT for “6. Payapa Bridge” and “7. Rangas3 Bridge” greatly exceeds the target.

Table 2: Annual Average Daily Traffic (AADT)

(Unit: vehicle/day)

Name of the Bridge (Region) (Note 1) (Completion Month and Year)	Baseline	Target		Actual		
	2001	Comple- tion Year	7 years after Comple- tion	2011	2012	2013
1. Bangcag (CAR) (Nov. 2009)	1,172	1,461	2,170	2,642	2,488	2,718
2. Amburayan (I) (Jan. 2010)	6,443	8,029	11,932	5,340	4,780	5,635
3. Pantal (I) (Mar. 2008) (Note 2)	N.A.	N.A.	N.A.	7,802	7,588	9,155
4. Quirino (I) (Dec. 2009)	6,443	8,029	11,932	5,828	5,562	5,996
5. Mabbang 2 (II) (Jun. 2012)	370	461	685	464	528	688
6. Payapa (IV-A) (Oct. 2007)	1,250	1,558	2,315	5,006	3,940	4,934
7. Rangas3 (V) (Sept. 2008)	685	854	1,269	4,373	5,814	6,172
< Data for following bridges are regarded as reference in this report. (Lao-ang 1 Bridge is deleted from monitoring. Baseline and target figures are provided as reference. >						
8. Embarcadero (VI) (Note 3) (Mar. 2013)	1,460	1,296	1,926	2,171	1,984	1,381
Culasi (VI) (Note 4) (Apr. 2011)	-	-	-	2,171	1,984	1,381
9. Lao-ang 1 (VIII) (Note 5) (-)	420	523	778	-	-	-
Sinedab (I) (Note 6) (Mar. 2012)	-	-	-	877	1,110	1,377
10. Malitbog (X) (Note 7) (2010)	285	355	528	811	912	837

Source: DPWH Project Management Office

Note 1) Region where the bridge is located is indicated in parenthesis.
 Note 2) Pantal Bridge (Region I) did not exist prior to the project because it is a newly constructed bridge on the new bypass road developed in the urban district.
 Note 3) Embarcadero Bridge (Region VI) was deleted from the project scope (Developed using GOP fund).
 Note 4) Culasi Bridge (Region VI) was added to this project in place of deleted Embarcadero Bridge (Region VI). (AADT volumes for both bridges are the same because they are located on the same road section).
 Note 5) Lao-ang 1 Bridge (Region VIII) was deleted from the project scope (not developed at the time of ex-post evaluation).
 Note 6) Sinedab Bridge (Region I) was added to this project in place of Lao-ang 1 Bridge (Region VIII). (Sinedab Bridge is located on Suyo-Cervantes-Mankayan-Abatan Road Section developed by ODA loan: Arterial Road Links Development Project (V).)
 Note 7) Malitbog Bridge (Region X) was deleted from the project scope (Developed using GOP fund).

3.2.1.2 Number of Days of Traffic Interruption in Case of Bridge Collapse

Table 3 shows the recent actual figures and targets¹¹ set forth at the time of the project appraisal concerning “number of days of traffic interruption in case of bridge collapse (days)”¹² for bridges subject to monitoring. The actual figure became zero after completion. Thus it can be judged that the objective is achieved.

Table 3: Number of Days of Traffic Interruption in Case of Bridge Collapse

(Unit: day)

Name of the Bridge (Region) (Note 1) (Completion Month and Year)	Baseline	Target		Actual		
	2001	Comple- tion Year	7 years after Comple- tion	2011	2012	2013
1. Bangcag (CAR) (Nov. 2009)	315	0	0	0	0	0
2. Amburayan (I) (Jan. 2010)	730	0	0	0	0	0
3. Pantal (I) (Mar. 2008) (Note 2)	N.A.	N.A.	N.A.	0	0	0
4. Quirino (I) (Dec. 2009)	730	0	0	0	0	0
5. Mabbang 2 (II) (Jun. 2012)	30	0	0	N.A.	0	0
6. Payapa (IV-A) (Oct. 2007)	158	0	0	0	0	0
7. Rangas3 (V) (Sept. 2008)	397	0	0	0	0	0
< Data for following bridges are regarded as reference in this report. (Lao-ang 1 Bridge is deleted from monitoring. Baseline and target figures are provided as reference. >						
8. Embarcadero (VI) (Note 3) (Mar. 2013)	332	0	0	N.A.	N.A.	0
Culasi (VI) (Note 4) (Apr. 2011)	-	-	-	0	0	0
9. Lao-ang 1 (VIII) (Note 5) (-)	730	0	0	-	-	-
Sinedab (I) (Note 6) (Mar. 2012)	-	-	-	N.A.	0	0
10. Malitbog (X) (Note 7) (2010)	60	0	0	0	0	0

Source: DPWH Project Management Office

Note 1) Region where the bridge is located is indicated in parenthesis.
 Note 2) Pantal Bridge (Region I) did not exist prior to the project because it is a newly constructed bridge on the new bypass road developed in the urban district.
 Note 3) Embarcadero Bridge (Region VI) was deleted from the project scope (Developed using GOP fund).
 Note 4) Culasi Bridge (Region VI) was added to this project in place of deleted Embarcadero Bridge (Region VI).
 Note 5) Lao-ang 1 Bridge (Region VIII) was deleted from the project scope (not developed at the time of ex-post evaluation).

¹¹ The target figure, zero, set forth at the time of appraisal may not have been realistic.

¹² When setting targets, the assumption was that non-repaired bridges will collapse, and repaired bridges by the project will not collapse.

Note 6) Sinedab Bridge (Region I) was added to this project in place of Lao-ang 1 Bridge (Region VIII). (Sinedab Bridge is located on Suyo-Cervantes-Mankayan-Abatan Road Section developed by ODA loan: Arterial Road Links Development Project (V).)

Note 7) Malitbog Bridge (Region X) was deleted from the project scope (Developed using GOP fund).

3.2.1.3 Reduction of Detour Distance in Case of Bridge Collapse (km)

Table 4 shows the comparison among baseline, targets¹³ and recent actual figures concerning “Reduction of Detour Distance in Case of Bridge Collapse (km)” for bridges subject to monitoring. The actual figure became zero km after completion. Thus it can be judged that the objective is achieved.

Table 4: Reduction of Detour Distance in Case of Bridge Collapse

(Unit: km)

Name of the Bridge (Region) (Note 1) (Completion Month and Year)	Baseline	Target		Actual		
	2001	Completion Year	7 years after Completion	2011	2012	2013
1. Bangcag (CAR) (Nov. 2009)	84.5	0	0	0	0	0
2. Amburayan (I) (Jan. 2010)	N.A.	0	0	0	0	0
3. Pantal (I) (Mar. 2008) (Note 2)	N.A.	0	0	0	0	0
4. Quirino (I) (Dec. 2009)	N.A.	0	0	0	0	0
5. Mabbang 2 (II) (Jun. 2012)	20	0	0	N.A.	0	0
6. Payapa (IV-A) (Oct. 2007)	N.A.	0	0	0	0	0
7. Rangas3 (V) (Sept. 2008)	15.0	0	0	0	0	0
< Data for following bridges are regarded as reference in this report. (Lao-ang 1 Bridge is deleted from monitoring. Baseline and target figures are provided as reference. >						
8. Embarcadero (VI) (Note 3) (Mar. 2013)	13.5	0	0	N.A.	N.A.	0
Culasi (VI) (Note 4) (Apr. 2011)	-	-	-	0	0	0
9. Lao-ang 1 (VIII) (Note 5) (-)	N.A.	0	0	-	-	-
Sinedab (I) (Note 6) (Mar. 2012)	-	-	-	N.A.	0	0
10. Malitbog (X) (Note 7) (2010)	N.A.	0	0	0	0	0

Source: DPWH Project Management Office

Note 1) Region where the bridge is located is indicated in parenthesis.

Note 2) Pantal Bridge (Region I) did not exist prior to the project because it is a newly constructed bridge on the new bypass road developed in the urban district.

Note 3) Embarcadero Bridge (Region VI) was deleted from the project scope (Developed using GOP fund).

Note 4) Culasi Bridge (Region VI) was added to this project in place of deleted Embarcadero Bridge (Region VI).

Note 5) Lao-ang 1 Bridge (Region VIII) was deleted from the project scope (not developed at the time of ex-post evaluation).

Note 6) Sinedab Bridge (Region I) was added to this project in place of Lao-ang 1 Bridge (Region VIII). (Sinedab Bridge is located on Suyo-Cervantes-Mankayan-Abatan Road Section developed by ODA loan: Arterial Road Links Development Project (V).)

Note 7) Malitbog Bridge (Region X) was deleted from the project scope (Developed using GOP fund).

¹³ The target figure, zero, set forth at the time of appraisal may not have been realistic.



Before

1. Bangcag Bridge (CAR)



After



Before

2. Amburayan Bridge (Region I)



After



Before

4. Quirino Bridge (Region I)



After



Before



After

6. Payapa Bridge (Region IV-A)



Before



After

7. Rangas3 Bridge (Region V)

Reference information on the existing bridge adjacent to Amburayan Bridge: There was a movement by local residents demanding to preserve the existing bridge, which was initially planned to be removed. However, if the existing bridge is destroyed by flood, the new bridge could be damaged, reducing the effect of the construction of the bridge. Therefore, as a result of consultation with the executing agency, local residents finally decided to remove the existing bridge. (The bridge was already removed at the time of ex-post evaluation.)

3.2.2 Qualitative Effects

3.2.2.1 Improvement of Traffic Safety and Accessibility of Bridges

Table 5 shows the results of the beneficiary survey¹⁴ to 120 residents and farmers in

¹⁴ Procedures for the beneficiary survey: Beneficiary survey was conducted, targeting 17 bridges located in Panay Island, central area of the Philippines (the Habana, Balua, Culasi, Nichols, Dapdap, Bongalonan, Iba, Panabigan, Dapog, Siraan, Butuan, Bayo, Igdalaguit, Bia-an, Catungan, Nagdayao and Bongol Bridges). 17 barangays were randomly selected from 8 municipalities (municipalities of Ajuy, Alimodian, Dumarao, Anini-y, Tobias Fornier, Valderrama, Hamtic and Sibalom, covering 336 barangays in total) surrounding the

the project area on traffic safety situation after the completion of the project. More than 90% of the respondents (110 residents) answered that “traffic safety situation was changed”, and of which, all the 110 respondents answered that “traffic safety situation was improved”. Specifically, more than 70% of 110 respondents pointed out that “traffic/warning signs became visible”, and more than 30% answered “lesser traffic accidents”. No one responded traffic safety situation was worsened.

Table 5: Traffic Safety Situation after the Completion of the Bridge

Question	Responses (Percentage, total=100%) (Frequency, n=120 residents)
Did you observe any changes regarding traffic safety situation after the completion of the bridge?	<ul style="list-style-type: none"> • Yes, traffic safety situation was changed: 91.7% (110 residents) • No change was observed on traffic safety situation: 8.3% (10 residents) • No idea: 0% (no resident)
Question	Responses (sum will not total to 100% (110 residents) since multiple answers were provided)
What kind of traffic safety effects can be observed? (Additional question to 110 residents who answered “Yes, traffic safety situation was changed” to the above question.)	<ul style="list-style-type: none"> • Visible traffic/warning signs: 74.5% (82 residents) • Lesser traffic accidents: 28.2% (31 residents) • Pedestrian path provided for pedestrians: 20.9% (23 residents) • Better visibility because of streetlights: 17.3% (19 residents) • Guardrails installed: 3.6% (4 residents) • Weight limit indicated: 3.6% (4 residents) • Bridge became wider: 0.8% (2 residents) etc.

Source: Results from the beneficiary survey

According to interview survey with executing agency, municipal government and local residents conducted during field study, all the respondents answered that appropriate traffic in terms of smooth flow, and accessibility and safety of bridges were realized due to this project. Specifically, there was following response from local residents: “before the project, the bridge was one-lane, therefore, one vehicle had to wait when there was a vehicle coming from the opposite direction. It was also dangerous to pedestrians to pass the side of the vehicle. In addition, because the bridge was an old wooden bridge, there was a danger that it may collapse before the development of the bridge. There were also safety concerns especially during rainy season and typhoon season when a river rose and the bridge was flooded. But after the project, two-lane permanent bridge with pedestrian path was constructed, which enabled local residents to cross regardless of weather.

targeted bridges, followed by a random selection of 120 respondents. (Data collection method: hearing investigation.)

Basic information of 120 respondents: Gender: Male 57 (47.5%), Female 63 (52.5%), Age group: Below 20 1 (0.8%), 20s 0 (0%), 30s 27 (22.5%), 40s 34 (28.3%), 50s 34 (28.3%), 60s and above 24 (20%).

Therefore, traffic safety, certainty, and accessibility of the bridge are secured.”

As a result of beneficiary survey and interview survey, it can be judged that improvement of traffic safety is realized with bridges having two-lanes and pedestrian paths, which have been developed by the project.

Tables 6 and 7 show the results of beneficiary survey on accessibility of bridges regarding improved access to hospital and school (primary and secondary school), respectively. Looking at the results, all respondents answered that “travel time to hospital and school has shortened since the completion of the bridge”.

Table 6: Reduction of Travel Time to Hospital after the Completion of the Bridge

Question	Responses (Percentage, total=100%) (Frequency, n=120 residents)
Has travel time to hospital shortened after the completion of the bridge?	<ul style="list-style-type: none"> • Yes, it has shortened: 100% (120 residents) • No, it has not shortened: 0% (no resident) • No idea: 0% (no resident)
Question	Responses
To what extent travel time to hospital has shortened? (Additional question to 120 residents who answered “Yes, it has shortened” to the above question.)	<ul style="list-style-type: none"> • Less than 15 minutes: 27.5% (33 residents) • 15 minutes to 30 minutes: 47.5% (57 residents) • 30 minutes to 1 hour: 18.3% (22 residents) • 1 hour to 2 hours: 6.7% (8 residents) • 2 hours to 4 hours: 0% (no resident) • More than 4 hours: 0% (no resident)

Source: Results from the beneficiary survey

Table 7: Reduction of Travel Time to School (Primary and Secondary School) after the Completion of the Bridge

Question	Responses (Percentage, total=100%) (Frequency, n=120 residents)
Has travel time to school (primary and secondary school) shortened after the completion of the bridge?	<ul style="list-style-type: none"> • Yes, it has shortened: 100% (120 residents) • No, it has not shortened: 0% (no resident) • No idea: 0% (no resident)
Question	Responses
To what extent travel time to school (primary and secondary school) has shortened? (Additional question to 120 residents who answered “Yes, it has shortened” to the above question.)	<ul style="list-style-type: none"> • Less than 15 minutes: 82.5% (99 residents) • 15 minutes to 30 minutes: 17.5% (21 residents) • 30 minutes to 1 hour: 0% (no resident) • 1 hour to 2 hours: 0% (no resident) • 2 hours to 4 hours: 0% (no resident) • More than 4 hours: 0.8% (no resident)

Source: Results from the beneficiary survey

As a result of beneficiary survey and interview survey, it can be judged that accessibility was enhanced through improving, replacing and constructing bridges by the

project.

3.2.2.2 Improved Market Access

Tables 8, 9, and 10 show the results of beneficiary survey to local residents and farmers regarding improved market access after the completion of the project, respectively. Looking at the results, all respondents answered that “travel time to market / palay (rice) and corn collection point / major urban centers have shortened since the completion of the bridge”. In addition, all the respondents answered that reduced travel time to the market was less than 30 minutes, and 98% of respondents answered that reduced travel time to palay and corn collection point was less than 30 minutes.

Table 8: Improvement of Market Access after the Completion of the Bridge

Question	Responses (Percentage, total=100%) (Frequency, n=120 residents)
Has travel time to market shortened after the completion of the bridge?	<ul style="list-style-type: none"> • Yes, it has shortened: 100% (120 residents) • No, it has not shortened: 0% (no resident) • No idea: 0% (no resident)
Question	Responses
To what extent travel time to market has shortened? (Additional question to 120 residents who answered “Yes, it has shortened” to the above question.)	<ul style="list-style-type: none"> • Less than 15 minutes: 75.8% (91 residents) • 15 minutes to 30 minutes: 24.2% (29 residents) • 30 minutes to 1 hour: 0% (no resident) • 1 hour to 2 hours: 0% (no resident) • 2 hours to 4 hours: 0% (no resident) • More than 4 hours: 0% (no resident)

Source: Results from the beneficiary survey

Table 9: Reduction of Travel Time to Palay and Corn Collection Point after the Completion of the Bridge

Question	Responses (Percentage, total=100%) (Frequency, n=120 residents)
Has travel time to palay/corn collection point shortened after the completion of the bridge?	<ul style="list-style-type: none"> • Yes, it has shortened: 100% (120 residents) • No, it has not shortened: 0% (no resident) • No idea: 0% (no resident)
Question	Responses
To what extent travel time to palay/corn collection point has shortened? (Additional question to 120 residents who answered “Yes, it has shortened” to the above question.)	<ul style="list-style-type: none"> • Less than 15 minutes: 70.0% (84 residents) • 15 minutes to 30 minutes: 27.5% (33 residents) • 30 minutes to 1 hour: 1.7% (2 residents) • 1 hour to 2 hours: 0.8% (1 resident) • 2 hours to 4 hours: 0% (no resident) • More than 4 hours: 0.8% (1 resident)

Source: Results from the beneficiary survey

Table 10: Reduction of Travel Time to Urban Centers after the Completion of the Bridge

Question	Responses
	(Percentage, total=100%) (Frequency, n=120 residents)
Has travel time to major urban centers shortened after the completion of the bridge?	<ul style="list-style-type: none"> • Yes, it has shortened: 100% (120 residents) • No, it has not shortened: 0% (no resident) • No idea: 0% (no resident)
Question	Responses
To what extent travel time to major urban centers has shortened? (Additional question to 120 residents who answered “Yes, it has shortened” to the above question.)	<ul style="list-style-type: none"> • Less than 15 minutes: 2.5% (3 residents) • 15 minutes to 30 minutes: 25.0% (30 residents) • 30 minutes to 1 hour: 52.5% (63 residents) • 1 hour to 2 hours: 20.0% (24 residents) • 2 hours to 4 hours: 0% (no resident) • More than 4 hours: 0% (no resident)

Source: Results from the beneficiary survey

Following responses were obtained from the result of interview survey with local residents during the field study: “access to market and urban center became possible regardless of weather after the project, and a trade of farm products and business chance increased due to more efficient distribution”, “both variety and number of public transportation increased, and local residents with private cars and bikes also increased, realizing improved market access.”

As a result of beneficiary survey and interview survey, it can be judged that enhanced market access and more efficient distribution have realized with the project.

3.3 Impact

3.3.1 Intended Impacts

3.3.1.1 Contribution to Activation of Local Economic Activities

Table 11 shows the results of beneficiary survey to local residents and farmers in the project area regarding effects on local economic activities after the completion of the project. All the respondents (120 local residents) answered “local economy has activated after the completion of the bridge”. Some concrete responses were: “number of business establishments (companies, shops and offices) has increased”, “high rise buildings and infrastructures have been constructed”, “local investments have increased”, “number of public vehicles has increased”, which indicate that the project has generated positive impacts on local economy.

Table 11: Effects on Local Economy after the Completion of the Bridge

Question	Responses
	(Percentage, total=100%) (Frequency, n=120 residents)
Were there any effects on local economy after the completion of the bridge?	<ul style="list-style-type: none"> • Activated: 100% (120 residents) • No change: 0% (no resident)

	<ul style="list-style-type: none"> • Slowed down: 0% (no resident) • Others: 0% (no resident) • No idea: 0% (no resident)
Question	Responses (sum will not total to 100% (120 residents) since multiple answers were provided)
What are specific examples of such "activated economic activities"? (Additional question to 120 residents who answered "Activated" to the above question.)	<ul style="list-style-type: none"> • Increased number of business establishments: 54.2% (65 residents) • High rise buildings and infrastructures constructed: 13.3% (16 residents) • More local investments: 6.7% (8 residents) • Increased number of public vehicles: 6.7% (8 residents) • Improved tourism industry: 5.8% (7 residents) • Increased number of lending facilities (banks, pawnshops etc.): 5.8% (7 residents) • Increased employment / employment opportunities: 5.0% (6 residents) • More resorts developed: 4.2% (5 residents) • Increased number of private owned vehicles: 2.5% (3 residents) • New market established: 2.5% (3 residents) etc.

Source: Results from the beneficiary survey

In addition, according to the results of interview survey with the executing agency and local residents during the field study, it was confirmed that commercial and business activities have been activated in the project area because of improved transportation after the completion of the project. These responses were consistent with the results of the beneficiary survey.

As regards data on agricultural production, the yield trends of palay and corn in 9 provinces¹⁵ where bridges for monitoring are located and those in the entire country are shown in the respective tables in the Attachment (pages 40-41). It is difficult to see evident correlation between the data shift and the project, however, when looking at the overall trend for the total production of 9 provinces where monitoring bridges are located, an upward trend for both palay and corn can be seen despite some rise and fall. Although effect by individual local bridges on agricultural production at provincial level is limited, it can be considered that the project has contributed to the increase of agricultural production to some extent through enhanced transport efficiency of farm products, from the results of the beneficiary survey.

As regards data on business activities, the trends in the numbers of establishments and employment in 9 provinces¹⁶ where bridges for monitoring are located and those in the

¹⁵ Because the number of bridges developed by the project is 137 nationwide, analysis was made focusing on the bridges selected for monitoring.

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entire country are shown in the table in the Attachment (page 42). While it is difficult to see evident correlation between the data shift and the project, when looking at the overall trend of 9 provinces where monitoring bridges are located, both the numbers of establishments and employment have shown increasing trend, and their growth rates have exceed those in the entire country in 2012.

3.3.1.2 Effects on Poverty Reduction

Table 12 shows the results of beneficiary survey regarding effects on reduction of poverty and social disparity after the completion of the bridge. 116 respondents out of 120 (around 97%) answered that poverty/social disparity situation has decreased. Remaining 4 respondents answered that no change has seen, and no respondent answered poverty/social disparity situation has increased.

Table 12: Effects on Reduction of Poverty and Social Disparity after the Completion of the Bridge

Question	Responses (Percentage, total=100%) (Frequency, n=120 residents)
Were there any changes in poverty/social disparity situation after the completion of the bridge?	<ul style="list-style-type: none"> • Poverty/social disparity situation decreased: 96.7% (116 residents) • No change in poverty/social disparity situation: 3.3% (4 residents) • Poverty/social disparity situation increased: 0% (no resident) • Others: 0% (no resident) • No idea: 0% (no resident)

Source: Results from the beneficiary survey

This project specifies “bridges for poverty reduction” where the rate of the poor among the beneficiaries of the project exceeds that among the national population. At the time of appraisal, 105 bridges out of 201 target bridges were identified as “bridges for poverty reduction”. At the time of ex-post evaluation, “bridges for poverty reduction” were reconfirmed because the number of bridges developed by the project was reduced from 201 to 137 in the end. Out of 137 bridges, 78 bridges are regarded as “bridges for poverty reduction.” Table 13 shows the Regions and Provinces where these 78 “bridges for poverty reduction” are located. These bridges are located in 11 Regions and 18 Provinces – Occidental Mindoro Province has the largest number of bridges (18 bridges), followed by Cagayan Province (8 bridges), and Quezon Province (7 bridges). In terms of Regional classification, Region IV-B has the largest number of bridges (18 bridges), followed by Region V and Region VII (11 bridges in both Regions).

Table 13: Regions and Provinces where “Bridges for Poverty Reduction” are Located

Region (Number of Bridges)	Province (Number of Bridges)
CAR (2)	Mountain Province (2)
I (4)	Pangasinan Province (4)
II (9)	Cagayan Province (8)
	Isabela Province (1)
III (1)	Nueva Ecija Province (1)
IV-A (7)	Quezon Province (7)
IV-B (18)	Occidental Mindoro Province (18)
V (11)	Albay Province (1)
	Camarines Sur Province (5)
	Catanduanes Province (3)
	Sorsogon Province (2)
VI (1)	Capiz Province (1)
VII (11)	Bohol Province (6)
	Cebu Province (5)
VIII (6)	Leyte Province (5)
	Northern Samar Province (1)
XIII (8)	Agusan del Norte Province (2)
	Surigao del Sur Province (6)
Total 78 Bridges (11 Regions, 18 Provinces)	

Source: Results from questionnaire survey of executing agency, and interview survey results from the field study

As regards regions and provinces where “bridges for poverty reduction” are located, table in the Attachment (page 43) shows the data on ratio of poor household (comparison of 2009 and 2012 data). According to the table, ratio of poor household increased in 5 Provinces and decreased in 13 Provinces out of 18 Provinces. In Occidental Mindoro Province where the largest number of “bridges for poverty reduction” is located, ratio of poor household fell significantly from 28.8% in 2009 to 21.5% in 2012. The figures show remarkable decrease compared with those in Region IV-B (decrease from 27.2% to 23.6%) where Occidental Mindoro Province is located. In Cagayan Province where second most number of “bridges for poverty reduction” is located, ratio of poor household fell from 22.5% (2009) to 15.2% (2012), and in Quezon Province ratio fell from 22.1% (2009) to 20.3% (2012).

Regarding effects on poverty reduction, it is difficult to see evident correlation between the data shift and the project due to external factors, however, it can be pointed out that in Occidental Mindoro Province where the largest number of “bridges for poverty reduction” is located, significant decrease of ratio of poor household has been observed in comparison with those in the entire Region IV-B.

3.3.1.3 Impacts on Local Farmers’ Living Standards

Table 14 shows the results of beneficiary survey to local residents and farmers in the

project area regarding effects on their income after the completion of the project. 115 respondents out of 120 (around 96%) answered that their income has increased. In addition, according to the interview survey with local residents during the field study, they have indicated that their income has risen due to increased income opportunities, and have shown satisfaction to the project's positive impacts.

Table 14: Effects on Effects on Farmers' Family Income after the Completion of the Bridge

Question	Responses
	(Percentage, total=100%) (Frequency, n=120 residents)
Effects on farmers' family income after the completion of bridge	<ul style="list-style-type: none"> • Increased: 95.8% (115 residents) • No change: 4.2% (5 residents) • Decreased: 0% (no resident) • Others: 0% (no resident) • No idea: 0% (no resident)

Source: Results from the beneficiary survey

3.3.2 Other Impacts

3.3.2.1 Impacts on the Natural Environment

Either Environmental Compliance Certificate (hereinafter referred to as "ECC") or Certificate of Non-Coverage (hereinafter referred to as "CNC") was issued by the Department of Environment and Natural Resources for all the bridges in the project. During the project implementation period, EMP (Environmental Management Plan) stipulated in the ECC was complied with.

As regards environmental monitoring during project implementation, a monitoring team consisting of different organizations (DPWH, Department of Environment and Natural Resources, Local Government Units (hereinafter referred to as "LGUs") of concerned province and municipalities, consultants etc.) was formulated and monitoring activities were conducted every quarter. The results were compiled in quarterly reports (major check items were air quality, water quality, noise, topography, subsidence, and ecology.) No particular problem has been observed on natural environment as a result of environmental monitoring.

According to the executing agency, as part of its environmental monitoring, it provided guidance to the contractors to give necessary environmental consideration during project implementation, and thus contractors have taken necessary mitigation measures.¹⁷ Therefore, it can be considered that there is no problem on natural environment.

According to the interview with local residents during the project site survey, no

¹⁷ Concrete measures include watering to mitigate effect on air quality (dust suppression) and limiting time for construction work avoiding civil works in early morning and at night.

particular complaint was pointed out during and after the project (in fact, some residents pointed out temporary effects during construction period but they mentioned that the effects were kept within an acceptable range, and that improvements have seen after the project completion).

Regarding the results of beneficiary survey to local residents and farmers in the project area, 85 respondents out of 120 beneficiaries (around 70% of total respondents) said that there were temporary effects on natural environment such as scattering of dust and noise during construction. However, 119 respondents (around 99% of the total respondents) answered “natural environment has improved” or “there has been no effect on natural environment” after the project completion. Now, therefore, it can be judged that there was no negative environmental problem.

3.3.2.2 Land Acquisition and Resettlement

The executing agency has carried out procedures for land acquisition and compensation payments based on the Land Acquisition and Resettlement Action Plan (hereinafter referred to as “LAPRAP”), following the DPWH’s guideline (Infrastructure ROW Procedural Manual, April 2003).. According to the interviews with the executing agency and local residents during the field study, consultations and public hearing regarding the contents of the project were carried out on continuous basis prior to its launch, reaching agreements on the amount of compensation without any problems. No particular problem has been observed for land acquisition and compensation procedures since the process has been taken place appropriately.

The results of land acquisition for each package are summarized in Table 15. Total of 929 lots and 1,614 improvements/structures were affected by the project, of which Pantan Bridge (package 3) was newly constructed on the new bypass road developed in the urban district, where 29 lots and 122 improvements/structures were affected.

For many legal land owners, resettlement did not take place because structures were just scooted back within the same piece of land. For some land owners who needed to resettle, the executing agency proposed alternative site based on LAPRAP, however, these landowners preferred to receive compensation and to move to other land they owned. Consequently, alternative site development was no longer necessary. Furthermore, implementation of livelihood program was not necessary either because change of livelihood did not take place as a result of resettlement. For those illegally occupying the land, compensation for land was not paid to them – they only received compensation in case their structures were demolished.

Table 15: Results of Land Acquisition

Package (Number of Bridges)	Land (Number of Lots)	Number of Improvements/Structures
Package 1 (17)	196	59
Package 2 (14)	145	228
Package 3 (64) (Note 1)	189	292
Package 4 (42)	399	1,035
Total (137)	929	1,614

Source: Results from questionnaire survey of executing agency

Note 1) In package 3, results of land acquisition concerning Pantal Bridge were: 29 lots and 122 improvements/structures.

This project has largely achieved its objectives. Therefore its effectiveness and impact is high.

3.4 Efficiency (Rating: ①)

3.4.1 Project Outputs

Comparison of planned and actual project outputs is summarized in Table 16. Summary was made for each package, according to provinces where each bridge is located. Refer to Table 1 for the status of 10 sample bridges subject to monitoring of operation and effect indicators.

Table 16: Comparison of Planned and Actual Project Outputs

Planned (At Project Appraisal) 201 Bridges	Actual 137 Bridges (Note 1)
Package 1 (Number of Bridges in parentheses)	
19 Bridges in total - Pangasinan Province (4) - Abra Province (1) - Benguet Province (7) - Ilocos Norte Province (2) - Ilocos Sur Province (5)	17 Bridges in total - Pangasinan Province (2) - Abra Province (1) - Benguet Province (8) - Ilocos Norte Province (2) - Ilocos Sur Province (4)
Package 2 (Note 2) (Number of Bridges in parentheses)	
54 Bridges in total - Apayao Province (1) - Kalinga Province (10) - Mountain Province (10) - Cagayan Province (16)	14 Bridges in total (Implemented by using GOP fund) - Apayao Province (1) - Kalinga Province (4) - Cagayan Province (2)

<ul style="list-style-type: none"> - Isabela Province (2) - Nueva Vizcaya Province (5) - Quirino Province (1) - Nueva Ecija Province (1) - Pampanga Province (5) - Zambales Province (1) - Bataan Province (2) 	<ul style="list-style-type: none"> - Isabela Province (1) - Pampanga Province (5) - Zambales Province (1)
Package 3 (Number of Bridges in parentheses)	
63 Bridges in total <ul style="list-style-type: none"> - Batangas Province (10) - Cavite Province (7) - Laguna Province (1) - Quezon Province (8) - Rizal Province (1) - Occidental Mindoro Province (6) - Oriental Mindoro Province (19) - Albay Province (1) - Sorsogon Province (2) - Camarines Sur Province (5) - Catanduanes Province (3) 	64 Bridges in total <ul style="list-style-type: none"> - Batangas Province (10) - Cavite Province (8) - Laguna Province (1) - Quezon Province (8) - Pangasinan Province (1) - Occidental Mindoro Province (6) - Oriental Mindoro Province (19) - Albay Province (1) - Sorsogon Province (2) - Camarines Sur Province (5) - Catanduanes Province (3)
Package 4 (Number of Bridges in parentheses)	
65 Bridges in total <ul style="list-style-type: none"> - Antique Province (15) - Capiz Province (1) - Guimaras Province (4) - Iloilo Province (6) - Negros Occidental Province (1) - Bohol Province (7) - Cebu Province (6) - Leyte Province (8) - Northern Samar Province (2) - Bukidnon Province (2) - Compostela Valley Province (4) - Agusan del Sur Province (2) - Surigao del Sur Province (6) - Davao Oriental Province (1) 	42 Bridges in total (1 bridge implemented by using GOP fund) <ul style="list-style-type: none"> - Antique Province (13) - Capiz Province (1) - Iloilo Province (3) - Bohol Province (7) - Cebu Province (6) - Leyte Province (5) - Agusan del Sur Province (1) - Surigao del Sur Province (5) - Ilocos Sur Province (1) (Sinedab Bridge) (Note 3)

Source: Results from questionnaire survey of executing agency

Note 1) The number of bridges developed in this project was reduced from the originally planned 201

to 137.

Note 2) As regards Package 2, when the Philippine government changed the funding source of this package to GOP fund, the package was divided into three: 2-A, 2-B, 2-C.

Note 3) In Package 4, Sinedab Bridge, located in Ilocos Sur Province, was developed using GOP fund.

The number of bridges initially planned to be improved, replaced, and developed was 201, whereas it was reduced to 137 in the end. This was due to “increase of input costs with the inflation”, an uncontrollable factor that led to increased project cost, for which the executing agency had no choice but to reduce the number of bridges. (Refer to “3.4.2.1 Project Cost” as described herein below.) According to the executing agency, following issues, other than cost factor, were considered when deleting the bridges from the project.

- Box Culvert Bridges,¹⁸ which can be developed using technology and fund on the side of the Philippines, were deleted.
- Bridges located in geographically isolated areas were deleted.
- Bridges located in areas with unstable security conditions were deleted.
- Bridges which have turned out to be already constructed or under construction (by using other sources of fund) at the time of design stage were deleted.

As mentioned before, the executing agency has expressed its intention to develop all the remaining bridges utilizing other sources of funds (such as GOP fund and funds from other donors such as UK, France and Austria). (Refer to “3.1.2 Relevance to the Development Needs of the Philippines”.) Therefore, it can be judged that changes in the scope of the Japanese ODA loan project have not affected the project objective. In addition, changes of outputs described below (design change and repairs/additional work in response to damages caused by typhoons) are deemed appropriate, in light of the actual situation at the start of the civil works.

<Major Changes of Outputs and their Reasons>

- Design change: 1. Revision from four-lane to two-lane due to additional road network along the area, which can be used in case of damage or collapse of the bridge, 2. revision of bridge structures due to unforeseeable physical condition at the time of original design, 3. revision of construction method due to the existence of bridges not qualified for Reinforced Concrete Box Culvert (RCBC) Bridge.
- Deletion of bridges for this Japanese ODA loan project: 1. Deletion of some bridges which were already constructed/under construction at the time of detailed design, 2.

¹⁸ Because this project was a Special Yen Loan Project, utilization of Japan’s technology and know-how was taken into consideration. Therefore, bridges that can be developed by using Philippine’s technology were deleted from the project.

Deletion of some bridges in order to cope with project cost overrun issue.

- Others: 1. Additional bridges and necessary repairs of access road and slope protection work due to the damages caused by typhoons (typhoon Frank in 2007 and typhoon Pepeng in 2009), 2. additional works as requested by LGUs. 3. addition of Culasi Bridge (the bridge was added to the project in place of deleted Embarcadero Bridge), and Sinedab Bridge (the bridge was added to the project in place of undeveloped Lao-ang 1 Bridge).

According to the executing agency, the bridges were improved, replaced and developed, in accordance with the DPWH guideline, so called “Blue Book”, which is the standard specifications used in the implementation of road, bridge and airport developments (revised in 1995 and 2004), and in this regard, no problems with standard and quality of the outputs. In fact, no particular issue has been observed as a result of field survey.

The total inputs of consulting services (detailed design, assistance in tendering, construction supervision and environmental measures (assistance in right-of-way acquisition/relocation, environmental monitoring etc.)) have significantly increased as shown in Table 17.

Table 17: Comparison of Planned and Actual Inputs of Consulting Service (M/M)

	Plan	Actual	Comparison
Foreign	463	394	Decreased by 69
Local	731	1,510	Increased by 779
Total	1,194	1,904	Increased by 710

Source: Information from JICA at the time of appraisal, results from questionnaire survey of executing agency, and interview survey results from the field study

According to the executing agency, reasons for significant increase of total inputs are as follows.

- During detailed design: Increase of man-month due to change of design and project scope (addition and deletion bridges)
- During tendering: Increase of man-month due to necessity of rebidding caused by failure of bidding process for several packages (packages 1, 2 and 4) and revision of package 2
- During civil works: Increase of man-month due to extended work schedule for construction supervision caused by project delay.

3.4.2 Project Inputs

3.4.2.1 Project Cost

The total project cost was initially planned to be 21,750 million yen (out of which 18,488 million yen was to be covered by Japanese ODA loan). In reality, the total project cost was 23,122 million yen (out of which 18,332 million was covered by Japanese ODA loan), which is higher than planned (106.3%¹⁹ of the planned amount).

The main reason for project cost overrun was due to increase of input costs²⁰ with the inflation during the project period, change of design and targeted bridges, additional payment of value added tax to contractors (tax rate increased from 10% to 12%), and increase of M/M of consultants. This was inevitable factor, difficult to avoid. As a measure to cope with increasing cost, the executing agency deleted the number of targeted bridges from the project scope.

3.4.2.2 Project Period

The overall project period was planned as 65 months, from March 2002 (conclusion of Loan Agreement) to July 2007 (completion of civil works), however, since the project commencement in March 2002 (conclusion of Loan Agreement), the project is still on-going at the time of ex-post evaluation (as of June 2014). The project period is 148 months as of June 2014, which is significantly longer than planned (228% of the initial plan).

Specifically, 14 bridges in package 2 are still on-going (i.e., not complete) at the time of ex-post evaluation. According to the executing agency, all 14 bridges are expected to be completed by the end of December 2014.

Table 18 shows comparisons of planned and actual project period.

Table 18: Comparison of Planned and Actual Project Period

Item	Planned (At Project Appraisal)	Actual (At Ex-post Evaluation)
1. Selection of consultants	Jan. 2002 – Dec. 2002 (12 months)	Feb. 2002 – May 2003 (16 months)
2. Detailed design	Jan. 2003 – Jun. 2004 (18 months)	Jun. 2003 – Dec. 2004 (19 months)
3. Bidding process	Feb. 2004 – Apr. 2005 (15 months)	Sept. 2004 – Sept. 2007 (37 months)
4. Civil works	Apr. 2005 – Jul. 2007 (28 months)	May 2006 – on-going (to be completed by the end of 2014)
5. Land acquisition	Apr. 2002 – Dec. 2003 (21 months)	Jun. 2005 – Sept. 2011 (76 months)

¹⁹ This percentage was calculated by comparing the actual cost after the scope change and planned cost before the scope change.

²⁰ According to the executing agency, cost of inputs such as materials, equipments operation and labor increased by an average of 13% over the 2006 costs, which became one of the major sources of significant rise of the project cost (despite a depreciation of local currency (Philippine peso) during the project implementation period, the total project cost exceeded the initial plan because of significant increase of project cost in peso terms).

6. Consulting services	Jan. 2003 – Jul. 2007 (55 months)	Jun. 2003 – on-going (to be completed by the end of 2014)
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Source: Information from JICA at the time of appraisal, results from questionnaire survey of executing agency, and interview survey results from the field study

The delay in the implementation schedule was caused mainly by 1. delay in bidding process (necessity of rebidding due to failure of bidding in several packages, and revision of package 2, which was implemented utilizing GOP fund), 2. extended implementation period due to change and additional project scope,²¹ 3. extra time required to ensure safety at the project site for Sinedab Bridge,²² 4. postponement of JICA concurrence for all tendering process until the value added tax issue is settled for ODA loan project, Second Magsaysay Bridge and Butuan City Bypass Road Construction Project.²³

3.4.3 Results of Calculations of Internal Rates of Return (Reference only)

Table 19 shows the result of recalculation of the economic internal rate of return (EIRR) based on the preliminary calculation conducted at the time of appraisal and the data and information obtained from the executing agency.

Table 19: Assumption and Results of EIRR Recalculation

	At Project Appraisal	At Ex-post Evaluation
EIRR	59.5%	47.9%
Benefit	Vehicle operating costs savings from replacement of bridges, vehicle operating costs savings from increased load limit, vehicle operating costs savings from reduction in bridge unservice due to flood, maintenance cost savings	
Cost	Construction cost, operation and maintenance cost	
Project Life	25 years after project completion	

The EIRR was 47.9%, which was less than the figure (59.5%) at the time of appraisal.

²¹ Package 1: Extended implementation period due to the typhoon Pepeng and Ondoy, Package 3: Delayed implementation period due to necessary repair after the downpour and flood for Batangas coastal road (access road) that lead to the bridge included in this project, Package 4: Extended implementation period due to the typhoon Frank and ground subsidence of the approach road of Bongalanan Bridge.

²² Sinedab Bridge was added to the project scope in August 2011, 1 month prior to the initial final disbursement date. Contractor could not start construction work until the official declaration of safety because the project site was an action area (conflict zone) of the New People's Army.

²³ In November 2005, Republic Act No. 9337 was enacted, otherwise known as Consolidated Value Added Tax Regulations of 2005, was implemented. This law had increased the value added tax for goods, materials and supplies from 10% to 12%. It has to be recalled that the ODA loan, Second Magsaysay Bridge and Butuan City Bypass Road Construction Project was awarded to the contractor before 2005 when the value added tax requirement was 10%. When Republic Act No. 9337 was imposed, the tax to be paid by the contractor was increased by 2%. DPWH could not consider the value added tax increase in the contract because the contract was already awarded. JICA, on the other hand, maintained that this issue should be resolved by DPWH, and that postponed concurrence for all tendering process of this project (Urgent Bridges Construction Project for Rural Development) until the issue was settled. (Information source: DPWH)

The increase of project cost in comparison with the planned cost, and the reduction of the number of bridges can be considered as major reasons for lower EIRR.

Both the project cost and project period significantly exceeded the plan. Therefore efficiency of the project is low.

3.5 Sustainability (Rating: ②)

3.5.1 Institutional Aspects of Operation and Maintenance

At the national level, Bureau of Maintenance (hereinafter referred to as “BOM”) is responsible for the operation and maintenance of roads and bridges developed through the project. At the regional level, each Regional Office of DPWH is responsible for its respective roads and bridges. The actual operation and maintenance work in the field is undertaken by each District Engineering Office (hereinafter referred to as “DEO”) in charge, under the supervision of respective Regional Office.²⁴ Operation and maintenance system is taken such that respective Regional Offices and DEOs are in close coordination to do their work in the field.

According to a result of interview survey and questionnaire survey of each DEO, the number of staffs necessary for operation and maintenance work is basically sufficient.²⁵ In addition, as regards Antique DEO and Iloilo Third DEO, where interview survey was conducted, no particular problem has been identified regarding the organizational structure of operation and maintenance of roads and bridges developed by the project at the time of ex-post evaluation.

DPWH is currently implementing its Rationalization Plan, aiming to increase efficiency and streamline its administrative structures.²⁶ As part of this initiative, site workers in charge of routine/periodic maintenance work for roads and bridges (responsible for cleaning, vegetation control, road repair etc.) have been employed from the local residents as Road Maintenance Crew (hereinafter referred to as “RMC”) to do their work, with supervision of DPWH.²⁷ This RMC system – utilizing local labor and generating employment – has been initiated through collaboration between DPWH and

²⁴ At the time of ex-post evaluation, 16 Regional Offices and 182 DEOs under the supervision of respective Regional Offices are established throughout the nation.

²⁵ The number of operation and maintenance staffs in Antique DEO is 8 (2 engineers, 1 foreman/capataz, 1 heavy equipment operator, and 4 road side workers). The number of operation and maintenance staffs in Iloilo Third DEO is 13 (1 engineer, 2 foreman/capataz, and 10 road side workers).

²⁶ DPWH headquarters had set up many Project Management Offices (hereinafter referred to as “PMOs”), however, organizational restructuring took place in June 28, 2013 based on its Rationalization Plan. As a result, PMOs were merged under one Unified Project Management Office (hereinafter referred to as “UPMO”). As regards roads and bridges, 3 departments – Road Management Department (in charge of international organizations), Road Management Department (in charge of bilateral donors), and Bridge Management Department – were established under the UPMO.

²⁷ According to the staff placement standard of DPWH, it is appropriate to deploy one RMC per 3.5km of road extension.

Department of Social Welfare and Development (hereinafter referred to as “DSWD”), and the system has been utilized as part of social welfare for poor households (job creation and livelihood support of local residents).²⁸



Road Maintenance Crew

3.5.2 Technical Aspects of Operation and Maintenance

As regards Antique DEO and Iloilo Third DEO, where interview survey was conducted, on the job training (OJT) is provided to operation and maintenance staffs. In addition, trainings are conducted on an irregular base by DPWH headquarters and Regional Office. The staffs are capable to cope with arising problems adequately on their own. Therefore, it can be observed that there are no major problems with the technical aspects of the operation and maintenance of the DEOs. In addition, according to the answers to the questionnaires from each DEO, annual work plans for operation and maintenance, covering the road sections and bridges developed by the project, have been prepared. Furthermore, DPWH Highway Maintenance Manual (1984) has been utilized by the operation and maintenance staffs, and methodology for operation and maintenance has been standardized across DPWH. In sum, no particular problem has been observed from technical aspects.

Highway Maintenance Manual (1984) is under revision with JICA Technical

²⁸ Memorandum of Agreement has been signed between DPWH and DSWD – DPWH selects 80% of local residents employed under the RMC system, and the remaining 20% to be selected from “4Ps” eligible households (poor households) defined by DSWD. “4Ps” stands for Pantawid Pamilyang Pilipino Program (livelihood program for the Filipino families), which was introduced as Conditional Cash Transfer Program, aiming to improve health, nutrition and education of extremely poor households (particularly of households with children aged 0-18 and pregnant women). Salaries for RMCs (including those selected from “4Ps” eligible households) are covered from Motor Vehicle User’s Charge, a special road fund to ensure the adequate maintenance of roads allocated to each DEO, and regular maintenance fund, through general approved allocations (general fund).

Cooperation Project, “Improvement of Quality Management for Highway and Bridge Construction & Maintenance, Phase 2”, at the time of ex-post evaluation. According to BOM, DPWH’s operation and maintenance work for roads and bridges, including those improved by the project, will be conducted based on the new manual after its completion. The new manual has been prepared in light of the current quality control technology for operation and maintenance of roads and bridges, new facilities expected to be introduced, ²⁹ re-examined standard unit costs for maintenance activities and so on.

3.5.3 Financial Aspects of Operation and Maintenance

The annual operation and maintenance costs associated with the project are first estimated by DEOs based on their annual work plan, then estimation will be reviewed by respective Regional Offices, followed by a review by DPWH headquarters (BOM) in Manila. Once approved, the budget is drawn out from DPWH headquarters’ ordinary budget and allocated to respective DEOs. According to DPWH, operation and maintenance budget has not been sufficiently allocated while on the other hand, the situation is not too critical as far as being judged from the results of project site survey and interview with relevant stakeholders.

There are 4 types³⁰ of DPWH operation and maintenance budget for roads and bridges as listed below.

1. Routine maintenance budget
2. Motor Vehicle User’s Charge (hereinafter referred to as “MVUC”)
3. Calamity fund
4. Emergency fund

1. Routine maintenance budget is an annual maintenance budget allocated to DEOs from DPWH headquarters. It comes from general fund or General Approved Allocations (hereinafter referred to as “GAA”). The budget is calculated based on Equivalent Maintenance Kilometer (hereinafter referred to as “EMK”) system.³¹ DPWH has

²⁹ For example, as regards repainting of road division line, DPWH will gradually introduce thermoplastic road marking machine (for reference, road marking used to be manually conducted), therefore maintenance manual will be revised accordingly, taking into account new technology.

³⁰ According to BOM, there is a special release fund, apart from the above four types of budget. Source of funds comes from investment cost saved as a result of bidding (differences between bidding price and expected price). The fund is not an annual budget but may be allocated to DEOs as need arises (such as to cover large-scale rehabilitation work with particular attention) subject to BOM’s scrutiny of budget requested from DEOs.

³¹ Calculation formula for operation and maintenance costs based on EMK system is as follows.

Operation and maintenance cost = Basic Cost × EMK

Basic Cost: Cost required to operate and maintain one kilometer of road for one year. It is determined each year by BOM, considering the inflation rate of each cost item.

EMK: Index determined by pavement type, road width, and traffic volume.

EMK = [road length (km) × EMK index (differing by road type and width) × EMK index (differing by road type and traffic volume)] + [bridge length (m) × EMK index (differing by bridge type)]

significantly raised routine maintenance budget in 2014³² to ensure the allocation commensurate with the operation and maintenance needs in the field. However, according to BOM, the increased allocation in 2014 would not cover accumulating defects from the past, and budget shortage still remains. In addition, BOM pointed out that there is no assurance for securing necessary budget for appropriate operation and maintenance, taking into account the accumulated defects from the past years.

2. MVUC is an allocation from a special road fund for maintenance established in 2003. As stated previously, labor costs for RMCs are covered partly from MVUC.

3. Calamity fund and 4. Emergency fund is the budget utilized in response to disaster and emergency situations, which is allocated from DPWH headquarters to relevant DEOs. (10% of routine maintenance budget, which each DEO request annually through respective Regional Offices is retained at DPWH headquarters – of which, half is used for calamity fund and the remaining half for emergency fund. DEOs need to request budget allocation from these funds, apart from requesting annual routine maintenance budget. The budget is not necessarily allocated because prioritization in accordance with the scale of disaster and degree of emergency is made for the actual allocation).

The recent DPWH road maintenance budget (actual allocation) is shown in Table 20.

Table 20: DPWH Road Maintenance Budget (Actual Allocation)

(Unit: 1,000 peso)

Budget	2010	2011	2012	2013	2014
1. GAA (General Fund) (including budget for routine maintenance)	2,000,000	4,000,000	4,000,000	4,000,000	6,589,715
2. MVUC	-	-	1,500,000	748,816	-

Source: DPWH BOM

Note: As regards calamity fund and emergency fund, 5% each of routine maintenance budget is retained for these funds.

According to the answers to the questionnaires from each DEO, it was pointed out that improvement was seen in budget allocation for necessary routine maintenance costs, however, according to Antique DEO, where interview survey was conducted, difficulties on cash flow management are pointed out due to the delays of actual allocation (budget release) from DPWH headquarters to the DEO. In fact, it would be difficult for DEOs to use up the budget if actual allocation is made at later time of the fiscal year, and that the unused amount cannot be carried over to the following year for use. As a matter of fact, according to the interview survey with DPWH headquarters (Comptrollership and

³² 67,422 peso/EMK in 2012, 67,387 peso/EMK in 2013, and 109,762peso/EMK in 2014.

Financial Management Services), it turned out to be that much time is spent to go through cumbersome approval process within DPWH headquarters. Actually, in order to allocate budget from DPWH headquarters to each DEO, approval from four offices³³ is required. Although efforts have been made to facilitate the approval process, Comptrollership and Financial Management Services mentioned that it would be only after the second quarter (April to June) of the fiscal year that the actual allocation would be made possible. In fact, improvement measures to streamline approval process within DPWH headquarters have been raised.

In addition, according to Iloilo Third DEO, where interview survey was conducted, although the DEO has been requesting budget from calamity fund for necessary repairs from damages caused by typhoon and flood, they have never been allocated such budget before (because budget allocation is decided according to the scale of disaster and degree of emergency). In case where budget was not allocated, the DEO had to divert necessary funds from annual routine maintenance budget for the repair.

Furthermore, at DPWH headquarters, Equipment Re-fleeting Program, a 5 year program between 2011 and 2016, is being implemented by Bureau of Equipment, to purchase new heavy machineries (grader, power shovel, dump truck, and wheel loader) and vehicles (patrol car), which are necessary for disaster measures/repairs and maintenance work. These heavy machineries are to be deployed to Regional Offices so that DEOs under their supervision can utilize. However, BOM pointed out that new heavy machineries and vehicles are not sufficiently deployed due to budget shortage. In fact, it was confirmed that DPWH has not been able to replace old heavy machineries and vehicles for many years, and some of them were more than 30 years old. As such, according to Iloilo Third DEO, DEOs borrow heavy equipments and vehicles from local contractors as needed, however, it was also pointed out that their timely usage is sometimes difficult because needs for heavy equipment and vehicles arise from other DEOs around the same time.³⁴ Given the fact that timely and efficient usage of heavy

³³ When allocating routine maintenance budget to DEOs from DPWH headquarters, preparation of application for budget (Memo for Release) is required by Department of Budget and Management, and its approval process is taking time. Based on the annual work plan prepared by each DEO, BOM drafts the Memo for Release, followed by review and approval from the Office of the DPWH Planning Service and the Office of the DPWH Secretary. After the approval, the Memo for Release is submitted to the Comptrollership and Financial Management Services, and then budget is released to DEOs in accordance with the DPWH internal procedures.

³⁴ According to BOM regarding policy direction of DPWH on operation and maintenance, while DPWH plans to further outsource the work, including procurement of heavy equipments and vehicles for national arterial roads, it should be considered from a long-term perspective. Reform would require change of mandate and responsibility of DPWH, change in mindset and the way of thinking of DPWH personnel as well as change of personnel organization, therefore, it cannot be pursued in a short time. (As regards rural roads, nothing is decided since reform is subject to institutional capacity and financial ability of LGUs.) Therefore, DPWH, aiming to advance reform gradually in a long run, has introduced Equipment Re-fleeting Program in 2011 to renew heavy machineries and vehicles and to directly manage operation and maintenance work in the face of a mountain of urgent operation and maintenance needs. (Refer to Column for DPWH's

equipments has been hindered, executing agency should renew and retain them to be prepared for possible disasters, although they may not be necessary for routine maintenance.

Based on the above, at the time of ex-post evaluation, there is concern in terms of financial aspects of operation and maintenance considering that (i) assurance is lacking for securing necessary budget for appropriate operation and maintenance, taking into account of the budget for accumulated defects from the past years, (ii) difficulties on cash flow management for DEOs are pointed out due to the delays of actual budget allocation from DPWH headquarters to DEOs, and (iii) old heavy machineries and vehicles have not been renewed for many years due to budget shortage.

3.5.4 Current Status of Operation and Maintenance

According to the interview with DEOs and their answers to the questionnaires, their task and frequency of operation and maintenance of roads and bridges are as follows.

- Side ditch and drainage cleaning (as need arises)
- Vegetation control (as need arises)
- Sealing of cracks and potholes on road pavement (as need arises)
- Reshaping of unpaved road shoulders (as need arises)
- Protection of road embankment (monthly)
- Application of concrete epoxy of precast concrete pavement (PCCP) blocks with scaling (monthly)
- Repainting of bridges (quarterly)
- Maintenance of traffic signs and guardrail (quarterly)
- Repainting of road division line (quarterly)
- Emergency repair in case problems occur such as slope protection (promptly)
- Preventive maintenance³⁵ (every 5 years)

According to a result of interview survey and questionnaire survey of DEOs, operation and maintenance works (routine, periodic, remedial, and preventive maintenance) have been conducted in accordance with the annual work plan prepared by DEOs. Following 3 bridges have encountered some problems but temporary/additional maintenance work has been conducted. The bridge conditions as of ex-post evaluation were as follows.

road sector asset management system.)

³⁵ DPWH has introduced road management analysis tool called “HDM-4” (Highway Development and Management) for the country’s entire road network. It is a system that enables to predict and extract road sections that need maintenance as well as repairs in the future, based on the past road usage record and current maintenance activities. As for preventive maintenance, based on HDM-4, road pavement and overlay are conducted where road degradation is expected.

- Salacop Bridge (from answers to the questionnaire): The bridge was totally washed out by typhoon Pepeng in October 2009. (Measures taken by DPWH: Temporary Reinforced Concrete Pipe Culvert (RCPC) was installed as access way. As for approach road, reconstruction was undertaken using JICA fund of the Post Ondoy and Pepeng Short-Term Infrastructure Rehabilitation Project, and the GOP funds. Construction of permanent bridge (RCBC bridge) is expected.)
- Amburayan Bridge (from answers to the questionnaire): A portion of the bridges was scoured by typhoon Ondoy and Pepeng. (Measures taken by DPWH: Initial pier protection works were undertaken and additional maintenance works were conducted.)
- Bongalonan Bridge³⁶ (from site survey information): Cracks occurred on the approach road of the bridge due to ground subsidence. (After the bridge was transferred to DPWH in July, 2014, the DEO is responsible for ground settlement work of approach road. Additional budget necessary for remedial measures (15 million pesos) have already been allocated from 2014 budget to the DEO.)



Bongalonan Bridge

As regards spare parts necessary for road and bridge maintenance, except for during an emergency, items above 50,000 pesos are procured by inviting local suppliers for bid, however, the procurement takes time for some types of spare parts. Nonetheless the situation cannot be regarded as critical problems.

³⁶ The bridge is located on Bdry. Antique/Iloilo – Anini-y – V. Jimenez Road, which has been developed by ODA loan project, Rural Road Network Development Project (III).

Column: DPWH's Road Sector Asset Management System

DPWH is aiming for an effective and efficient management of road assets, and has commissioned "Comprehensive Road Maintenance Program" to private sector to implement maintenance work for national arterial roads on a project basis – for foreign funded road projects after preparing maintenance program. (According to BOM, among the country's total length of national arterial road of about 31,500km, little less than 4%, i.e., approximately 1,200km is covered by this program.)

The World Bank is taking the lead of this program through its on-going "National Roads Improvement and Management Program Phase 2 (NRIMP 2)" (program period: 2008-2014), with 4 road sections – South Luzon package, Mindoro East Coast package, Panay Island package, and Negros Island package – outsourcing its maintenance to private sector. JICA, also through its "Road Upgrading and Preservation Project", is providing support to DPWH to utilize private sector for maintenance work. The program is consistent with DPWH strategy to outsource maintenance work, and according to BOM, DPWH is aiming to institutionalize this initiative, beyond current project basis, in the future. However, it is unclear whether this initiative will be expanded to rural roads since it entails institutional capacity and financial ability of LGUs.

Some problems have been observed in terms of the financial aspects of the maintenance. Therefore sustainability of the project effect is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project improved, replaced, and constructed bridges on national roads that lead to urban centers with the aim of securing safe and efficient distribution in the surrounding areas. The project objective – to improve road network for safe and efficient transport, contributing to the development of regional economies as well as to redress the economic disparity by enhancing quality of bridges in rural areas through replacing Bailey bridges with permanent bridges – is consistent with the development policy of the Philippines and with the development needs both at the time of the appraisal and ex-post evaluation, as well as Japan's ODA policy at the time of appraisal; thus, the relevance of the project is high. Annual average daily traffic of bridges selected for monitoring mostly exceeded the target, and number of days of traffic interruption in case of bridge collapse as well as reduction of detour distance in case of bridge collapse became zero, respectively, after the completion. In addition, the results of interview and beneficiary survey in the field have

shown local residents' satisfaction to the benefit of the project (improvement of accessibility and safety of bridges, enhancement of market access, and promotion of transport efficiency). Furthermore, the project is also contributing to the activation of local economic activities, reduction of poverty and economic disparity, and improvement of local farmers' livelihood; thus, the project's effectiveness and impact are high. On the other hand, the project cost exceeded the plan and the project period was significantly longer than planned; thus, efficiency is low. As regards operation and maintenance, old heavy machineries and vehicles have not been replaced adequately due to insufficient budget; thus, sustainability of the project is fair.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

- Importance of renewing and securing heavy machineries and vehicles for operation and maintenance works

Aging heavy machineries and vehicles have become obstacles for carrying out timely and appropriate operation and maintenance work. DPWH Bureau of Equipment has been purchasing and deploying new heavy machineries and vehicles to Regional Offices so that DEOs under their supervision can utilize them, however, they are not sufficiently allocated due to budget shortage. DEOs have been borrowing heavy equipments and vehicles from local contractors as needed, however, their timely usage is difficult in some cases. While operation and maintenance budget for 2014 was greatly increased (costs for purchasing heavy equipments and vehicles are covered by this budget), it is important that DPWH further secures budget to renew heavy equipments and vehicles in order to strengthen sustainability of the project.

- Importance of preparing repair plans and securing budget for expected future large-scale repair and rehabilitation

In addition to preparing routine/periodic maintenance work plan (annual work plan), DPWH should be prepared for major repair and rehabilitation in the future including preparation for the budget plans. While it is unnecessary in the current state, still in the early period after project completion, DEOs will need to request additional budget to DPWH headquarters (BOM) in case of need for major repairs in the future because it is not realistic for them to carry out major repairs using the annual budget. Therefore, it is important that BOM further secures special release fund and emergency fund so that timely allocation to DEOs will be realized.

- Importance of timely budget release from DPWH headquarters to DEOs

As pointed out by DEOs regarding difficulties on their cash flow management caused by the delays of actual allocation of routine maintenance budget from DPWH headquarters to DEOs, it is recommended that DPWH takes measures to streamline approval process within the headquarters to release budget at an early stage of the fiscal year (within the first quarter: January to March, for example) to meet the needs of DEOs. At the central level, Department of Budget and Management has already carried out reform to facilitate budget release from GAA to DPWH – budget is released to DPWH soon as budget for the Philippine government is approved (therefore, by early January, the beginning of a fiscal year, budget is already released from GAA to DPWH). On the other hand, approval process is taking time within DPWH headquarters due to time-consuming procedures – after BOM drafts the Memo for Release, review and approval from the Office of the DPWH Planning Service and the Office of the DPWH Secretary are required before the Comptrollership and Financial Management Services releases budget to DEOs (refer to the footnote in page 32). In fact, necessity for streamlining the process within DPWH headquarters has been raised. It is proposed that BOM should directly submit the Memo for Release to Comptrollership and Financial Management Services for approval (without involvement of DPWH Planning Service and the Office of the DPWH Secretary), and make sure the budget is released promptly to DEOs upon approval. Therefore, it is important to facilitate budget release process by strengthening BOM's responsibility and enhancing its accountability mechanism.

4.3 Lessons Learned

- Importance of institutionalizing advance procurement system

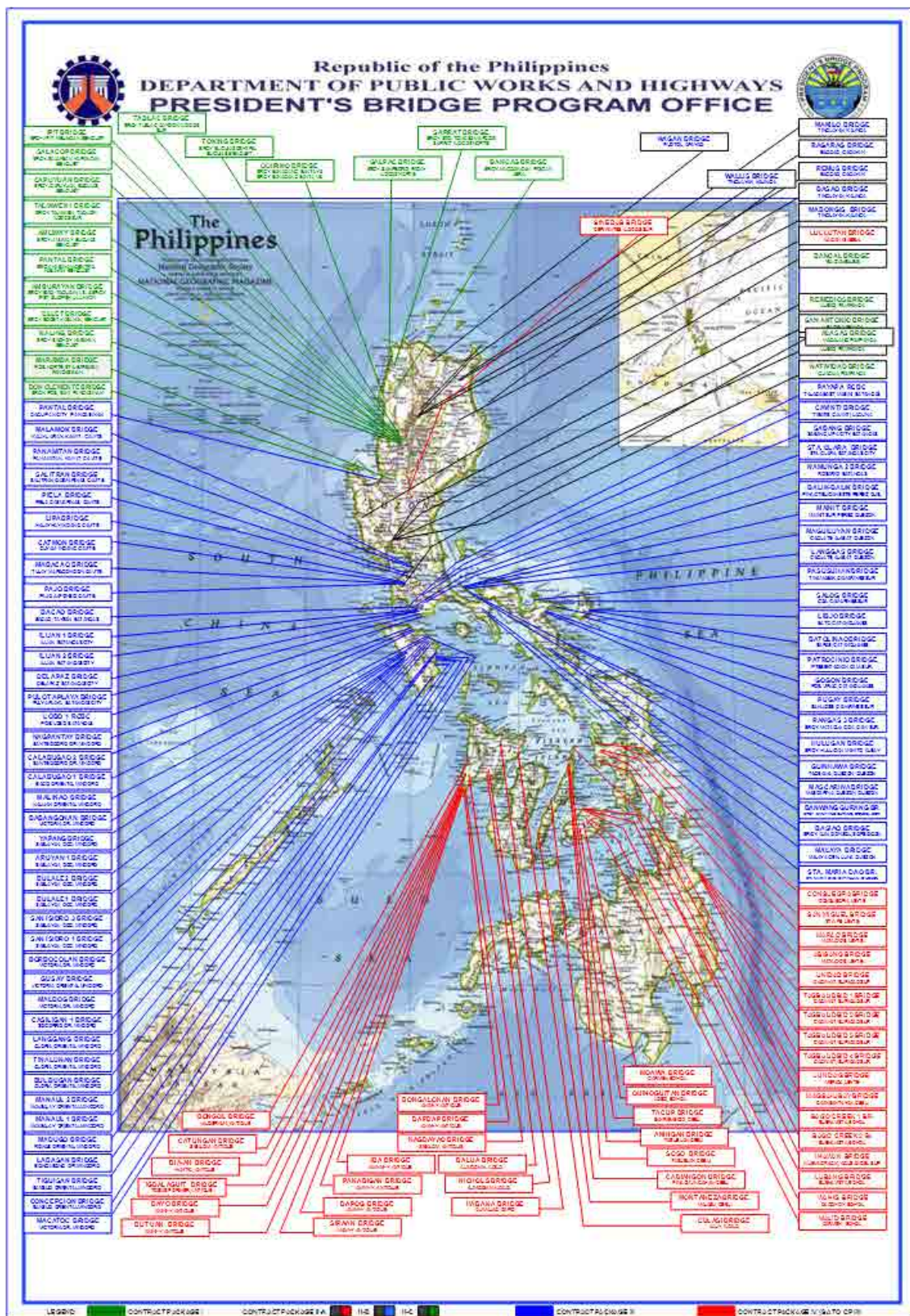
One of the major reasons for delay of road and bridge projects in the Philippines has been the delay in selection process of consultants and contractors. This is an issue applicable not only to this project but many other road and bridge projects which DPWH has implemented in the past. In order to cope with the situation, DPWH and JICA have been promoting advance procurement system. Specifically, this project facilitation initiative goes like this: as soon as pledge (Japanese Government announcing to the Philippine government its intention to provide Japanese ODA loan with a concrete amount) is made, DPWH immediately starts selection process of consultants who would undertake detailed design work. Once a loan agreement is signed between JICA and DPWH, and the loan agreement becomes effective, consultants for detailed design is awarded (subject to JICA concurrence), enabling consultants to commence their work within less than six months after the conclusion of a loan agreement. By introducing advance procurement, selection of civil works contractors, selection of consultants for

construction supervision, and preparation of right-of-way acquisition can take place in parallel process with the detail design , thereby expediting the entire project implementation. In fact, advance procurement has already been introduced in “Central Luzon Link Expressway Project” and “Arterial Road Bypass Project (2)” (both are Japanese ODA loan projects), and their tendering process seems to be on track to this point. So far, this good practice has been introduced on an individual project basis, but if it can be applied to the whole DPWH road and bridge projects, more efficient implementation of the project is expected in the entire DPWH road sector.

- Importance of local residents’ participation in routine/periodic maintenance work

In this project, site workers in charge of routine/periodic maintenance work for roads and bridges are employed from the local residents as RMCs, with supervision of DPWH. This initiative facilitates local participation in maintenance work, employment creation for local residents and increases efficiency of maintenance work. Especially, the employment of RMCs from the poor household, an initiative as a result of collaboration between DPWH and DSWD, is regarded as part of social welfare. It is expected that such cross-ministerial initiatives will be strengthened in the future. But there is room for further improvement. Currently, RMCs employed from poor households are in charge of basic maintenance operations such as cleaning and vegetation control, which makes it difficult for them to acquire skills that can be utilized for their successive jobs after the employment period. As such, it is recommended that trainings to be provided to them within the 3 months employment period so that RMCs can acquire skills (such as repainting of road division line and sealing of cracks and potholes on road pavement) to support their livelihood. In this way, the initiative will become even more useful from the perspective of “facilitating measures for poverty reduction”.

Attachment:



Source: DPWH Project Management Office

Location Map for Each Bridge

< Data on Agricultural Production >

Changes in Palay Production in Provinces where Sample Bridges are Located and the Entire Country

(Unit: ton)

Province	2008	2009	2010	2011	2012	2013
Abra Province	75,528	76,302	77,611	80,428	82,333	79,444
Ilocos Sur Province	202,647	168,028	183,182	191,152	208,380	209,302
La Union Province	161,709	124,997	132,557	146,666	156,023	157,275
Pangasinan Province	1,027,289	802,108	940,700	958,270	1,057,580	1,065,036
Cagayan Province	707,172	681,313	616,321	784,622	875,721	829,737
Batanes Province	60,218	55,800	53,423	49,569	43,206	52,198
Camarines Sur Province	526,936	535,090	568,327	520,322	563,749	601,479
Iloilo Province	942,286	944,050	659,970	959,239	995,402	822,452
Bukidnon Province	297,296	330,541	336,512	353,487	373,221	400,491
Total palay production in 9 provinces	4,001,081	3,718,229	3,568,603	4,043,755	4,355,615	4,217,414
Growth rate of palay production in 9 provinces (%)	4.31	-7.07	-4.02	13.31	7.71	-3.17
Total palay production in the Philippines	16,815,548	16,266,417	15,772,319	16,684,062	18,032,422	18,439,406
Growth rate of total palay production in the Philippines (%)	3.54	-3.27	-3.04	5.78	8.08	2.26

Source: Bureau of Agricultural Statistics

Note) Data for Northern Samar Province, where Lao-ang1 Bridge is located, is not included because improvement of the bridge was not realized at the time of ex-post evaluation.

Changes in Corn Production in Provinces where Sample Bridges are Located and the Entire Country

(Unit: ton)

Province	2008	2009	2010	2011	2012	2013
Abra Province	9,238	11,737	12,102	15,841	16,139	16,153
Ilocos Sur Province	72,472	64,672	55,341	63,579	69,447	73,267
La Union Province	21,387	20,535	19,030	23,076	26,395	28,898
Pangasinan Province	211,229	207,528	230,521	249,070	285,180	289,607
Cagayan Province	297,984	335,604	261,240	371,800	432,333	361,171
Batanes Province	20,030	20,228	24,280	21,187	15,323	22,918
Camarines Sur Province	110,704	96,549	85,667	125,730	136,233	161,863
Iloilo Province	198,534	124,546	122,141	164,839	175,945	174,798
Bukidnon Province	740,869	777,256	777,642	810,054	845,514	804,487
Total corn production in 9 provinces	1,682,447	1,658,655	1,587,964	1,845,176	2,002,509	1,933,162
Growth rate of corn production in 9 provinces (%)	10.41	-1.41	-4.26	16.20	8.53	-3.46
Total corn production in the Philippines	6,928,225	7,034,033	6,376,796	6,971,221	7,406,830	7,377,076
Growth rate of total corn production in the Philippines (%)	2.84	1.53	-9.34	9.32	6.25	-0.40

Source: Bureau of Agricultural Statistics

Note) Data for Northern Samar Province, where Lao-ang1 Bridge is located, is not included because improvement of the bridge was not realized at the time of ex-post evaluation.

< Data on Business Activities >

Number of Establishments and Employments in Provinces where Sample Bridges are Located and the Entire Country

Province	2008	2009	2010	2011	2012
Abra Province	862	861	863	978	1,154
	3,445	3,506	3,649	3,649	4,750
Ilocos Sur Province	4,826	4,838	4,829	4,829	6,514
	14,982	15,814	14,853	15,180	25,194
La Union Province	7,611	7,005	6,990	7,699	8,398
	32,253	29,493	30,203	33,230	37,973
Pangasinan Province	24,140	24,140	24,101	24,330	26,502
	79,057	79,634	78,510	87,496	118,209
Cagayan Province	6,479	6,504	6,509	7,122	9,171
	19,956	20,565	20,766	23,468	42,794
Batanes Province	19,675	19,909	19,853	20,512	22,668
	119,846	120,704	122,805	140,118	179,294
Camarines Sur Province	10,112	10,299	10,283	10,523	13,882
	43,423	49,706	49,369	47,491	68,031
Iloilo Province	16,081	16,197	16,128	16,361	18,606
	74,626	80,487	79,089	81,921	116,259
Bukidnon Province	6,232	6,289	6,277	7,746	9,071
	38,346	44,099	44,082	47,961	62,457
Number of establishments in 9 provinces	96,018	96,042	95,833	100,100	115,966
Growth of number of establishments in 9 provinces (%)	-3.26	0.02	-0.22	4.45	15.85
Number of total employment in 9 provinces	425,934	444,008	443,326	480,514	654,961
Growth rate of number of total employment in 9 provinces (%)	4.08	4.24	-0.15	8.39	36.30
Number of establishments in the Philippines	761,409	780,505	777,687	820,255	944,897
Growth rate of number of establishments in the Philippines (%)	-2.87	2.51	-0.36	5.47	15.20
Number of total employment in the Philippines	5,544,590	5,691,110	5,669,297	6,345,742	7,589,591
Growth rate of Number of total employment in the Philippines (%)	6.88	2.64	-0.38	11.93	19.60

Source: National Statistics Office

Note 1) Upper figures for each province: number of establishments, lower figures for each province: number of employment

Note 2) Data for Northern Samar Province, where Lao-ang1 Bridge is located, is not included because improvement of the bridge was not realized at the time of ex-post evaluation.

< Data on Ratio of Poor Household >

Ratio of Poor Households for Regions and Provinces where “Bridges for Poverty Reduction” are Located

Regions and Provinces where “Bridges for Poverty Reduction” are located	Ratio of Poor Households (%)	
	2009	2012
Entire Philippines	20.5	19.7
Entire CAR	19.2	17.5
Mountain Province	39.3	27.9
Entire Region I	16.8	14.0
Pangasinan Province	17.2	14.9
Entire Region II	20.2	17.0
Cagayan Province	22.5	15.2
Isabela Province	22.6	19.0
Entire Region III	10.7	10.1
Nueva Ecija Province	24.9	19.6
Entire Region IV-A	8.8	8.3
Quezon Province	22.1	20.3
Entire Region IV-B	27.2	23.6
Oriental Mindoro Province	28.8	21.5
Entire Region V	35.3	32.3
Albay Province	30.2	33.9
Camarines Sur Province	39.8	31.7
Catanduanes Province	22.6	27.1
Sorsogon Province	29.8	31.3
Entire Region VI	23.6	22.8
Capiz Province	22.9	22.3
Entire Region VII	26.0	25.7
Bohol Province	36.6	30.6
Cebu Province	22.3	18.9
Entire Region VIII	34.5	37.4
Leyte Province	29.8	31.4
Northern Samar Province	42.8	43.5
Entire Region XIII	46.0	31.9
Agusan del Norte Province	37.3	27.7
Surigao del Sur Province	44.1	28.3

Source: Philippine National Statistical Coordination Board

Comparison of the Original and Actual Scope of the Project

Item	Original	Actual
1. Project Outputs	<p>1) Civil Engineering Work 201 bridges on national roads within certain range from urban centers (number of bridges for each package as follows)</p> <ul style="list-style-type: none"> • Package 1: 19 bridges • Package 2: 54 bridges • Package 3: 63 bridges • Package 4: 65 bridges <p>2) Consulting Services</p> <ul style="list-style-type: none"> • Detailed design • Assistance in tendering • Construction supervision of the project • Environmental measures (assistance in right-of-way acquisition/relocation, environmental monitoring etc.) 	<p>1) Civil Engineering Work 137 bridges on national roads within certain range from urban centers (number of bridges for each package as follows)</p> <ul style="list-style-type: none"> • Package 1: 17 bridges • Package 2: 14 bridges • Package 3: 64 bridges • Package 4: 42 bridges <p>The total number of targeted bridges was reduced to 137 in the end, but following modifications were made based on the actual situation at the time of start of construction: (1) changing design, bridge structures, and construction method, (2) dropping some bridges from project scope, and (3) adding some work to recover from damages caused by typhoons, and adding some bridges to project scope.</p> <p>2) Consulting Services Implemented as planned.</p>
2. Project Period	March, 2002 – July, 2007 (65 months)	March, 2002 (conclusion of L/A) - on-going (more than 148 months*) *148 months at the time of ex-post evaluation (June, 2014)
3. Project Cost		
Amount paid in Foreign currency	15,172 million yen	7,223 million yen
Amount paid in Local currency	6,578 million yen (2,860 million pesos)	15,899 million yen (7,949 million pesos)
Total	21,750 million yen	23,122 million yen
Japanese ODA loan portion	18,488 million yen	18,332 million yen

Exchange rate	1 peso = 2.3 yen (As of August, 2001)	1 peso = 2.00 yen (Average between 2003 to 2011)
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[END]

Republic of the Philippines

Ex-Post Evaluation of Japanese ODA Loan

“Central Mindanao Road Project”

External Evaluator: Keiko Watanabe

Mitsubishi UFJ Research & Consulting Co., Ltd.

0. Summary

The Project upgraded existing rural roads of southwestern Mindanao with the aim of securing a safe and efficient road network in the surrounding areas. The project objective - to stipulate and revitalize local economy as well as to ensure stability of the region by improving connectivity through facilitation of movement of goods, services and people between rural communities in the major cities and towns of the central Mindanao – is consistent with the development policy of the Philippines and with the development needs both at the time of the appraisal and ex-post evaluation, as well as Japan’ ODA policy at the time of appraisal. Besides, from the viewpoint of peacebuilding, the timing of the implementation of the project was appropriate; thus, the relevance of the project is high. Annual average daily traffic far exceeded the target and travel time was reduced as expected. A beneficiary survey confirmed that the benefits of the project (improving the access to markets and hospitals, reduction of transport cost, improving security and safety) were recognized by local residents. Furthermore, the project contributed to the improvement of the standard of life of local residents through agriculture promotion, one of the main industries of Mindanao, and revitalization of economy as a result of the improvement of efficiency of distribution; thus, the project’s effectiveness and impact are high. On the other hand, both project cost and project period exceeded the plan; thus, efficiency is fair. In regard to operation and maintenance, no major problems have been observed. However, there is room for improvement on institutional and technical aspects such as establishment of training system to upgrade technical skills for the staff in the Autonomous Region in Muslim Mindanao (hereinafter referred to as “ARMM”¹); thus, sustainability of the project is fair.

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

¹ ARMM: Autonomous Region in Muslim Mindanao. ARMM region was created in 1989 through Republic Act of 1987. As a result of the referendum, 4 provinces (Sulu, Tawi-Tawi, Maguindanao, Lanao der Sur) won autonomy. In addition, Province of Basilan and city of Marawi joined ARMM region after the 2001 referendum.

1. Project Description



Project Road (Section 2: North Upi – Maguindanao/
Sultan Kudarat Boundary)

1.1 Background

Mindanao, an island in southern Philippines, has high development potential, being endowed with abundant natural resources and vast stretches of arable land. The island, however, experienced localized armed conflict for more than 30 years (note: information at the time of appraisal in 2003). As the fighting was fiercest in the southwestern part, the project area, its economy was devastated and this region remained one of the poorest in the country. The Arroyo administration (at the time of appraisal), which had committed itself to poverty reduction, has accorded the highest priority to economic development in Mindanao. The main agenda of the government in the Medium-Term Philippine Development Plan (2001-2004) included further progress in consolidating peace and stability as well as sustainable development. Nevertheless, basic infrastructure development such as roads which becomes the foundation of development has been delayed.

The target area of the project was situated in the mountainous area. Most of the part of the existing roads was narrow and unpaved; even there was a disused part due to the damage caused by the past fighting. Local farmers along the road had limited access to the market. In addition, the night travel was very dangerous due to the bad condition of the roads and security. Therefore, the project roads had not fulfilled to play an important role for the regional development. It became an urgent and important issue to establish safe and efficient roads in order to promote economic development and revitalization, as well as contribute to a stable regional security by facilitating movement of goods and people through improvement of intra-regional links.

1.2 Project Outline

The objective of the project is to improve intra-regional links, particularly the access of farming villages to the regional road network, increase human and freight movement, and

increase the efficiency of as well as cut costs of transport in Cotabato and surrounding areas, thereby contributing to a stable regional security situation. Under this project, the existing roads between Cotabato, the core city in southwestern Mindanao, and Kalamansig in the Sultan Kudarat Province would be widen and improved, together with replacement of temporal bridges along the roads to permanent ones.

Loan Approved Amount/ Disbursed Amount	3,717 million yen / 3,165 million yen
Exchange of Notes Date/ Loan Agreement Signing Date	March 2003 / December 2003
Terms and Conditions	Interest Rate: 2.2% Repayment Period: 30 years (Grace Period: 10 years) Condition for Procurement: General Untied
Borrower/ Executing Agency(ies)	The Government of the Philippines / The Department of Public works and Highways (DPWH)
Final Disbursement Date	January 2012
Main Contractor (Over 1 billion yen)	【Section 1】 Junction Awang – North Upi Road: R.D. Interior, Jr. Construction (Philippines) 【Section 2】 North Upi - Maguindanao/Sultan Kudarat Boundary Road: Hanjin Heavy Industries and Construction Co., Ltd. (Korea) 【Section 3】 Maguindanao/Sultan Kudarat Boundary – Lebak - Kalamansig: P.L. Sebastian Construction (Philippines)/Wee Eng Construction (China) (JV)
Main Consultant (Over 100 million yen)	Katahira & Engineers International (Japan)/ Engineering and Development Corporation (Philippines)/ Cebu Engineering and Development Corporation Inc. (Philippines)/ Perk Technical Consultants Corporation (Philippines)/ Inter-Structure System Inc. (Philippines)/ Woodfields Consultants Inc (Philippines) (JV)
Feasibility Studies, etc.	<ul style="list-style-type: none"> • DPWH “Central Mindanao Road Project” F/S (July 2001) • DPWH “Master Plan on Regional Road Network in Visayas and Mindanao” F/S (February 1999)
Related Projects	<p>< Yen Loan Project (L/A date) ></p> <ul style="list-style-type: none"> • Philippine-Japan Friendship Highway Rehabilitation

	<p>Project (I) (II) ((I) March 1997, (II) December 1999)</p> <p>< Technical Cooperation Project ></p> <ul style="list-style-type: none"> • The Study on Infrastructure (Road Network) Development Plan for the Autonomous Region in Muslim Mindanao (ARMM) (2010) • Improvement of Quality Management for Highway and Bridge Construction and Maintenance (Phase I: February 2007 - February 2010, Phase II: October 2011 - September 2014) <p>< Grant Aid (E/N Date) ></p> <ul style="list-style-type: none"> • The Project for Construction of Bridges along Rural Roads (Phase I (April 1988), Phase II (October 1988), Phase III (April 1990 and February 1992), Phase IV (January 1993 and July 1993) <p>< International Organizations ></p> <p>【 World Bank 】 National Roads Improvement and Management Program Phase 2 (NRIMP 2)</p> <p>【 Asia Development Bank 】 Road Improvement and Institutional Development Project</p> <p>【 USAID 】 Maitum - General Santos Road Project</p>
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2. Outline of the Evaluation Study

2.1 External Evaluator

Keiko Watanabe, Mitsubishi UFJ Research & Consulting Co., Ltd.

2.2 Duration of Evaluation Study

Duration of ex-post evaluation study was conducted as follows;

Duration of the Study: November, 2013 - December, 2014

Duration of the Field Survey: April 27 - May 8, 2014, July 13 - July 25, 2014

2.3 Constraints during the Evaluation Study

Due to the change of security situation of Mindanao, the face to face interviews were conducted only in Manila. Therefore the coverage of the interviewees was limited and the actual field survey at the project site could not been conducted by the external evaluator. The efforts were made to cover this obstacle by collecting information through the questionnaires, inviting a key official to Manila for interview, and utilizing the results from the project survey conducted by the local consultant. However, the evaluation study had constraints to a certain

extent for the field survey and access of information.

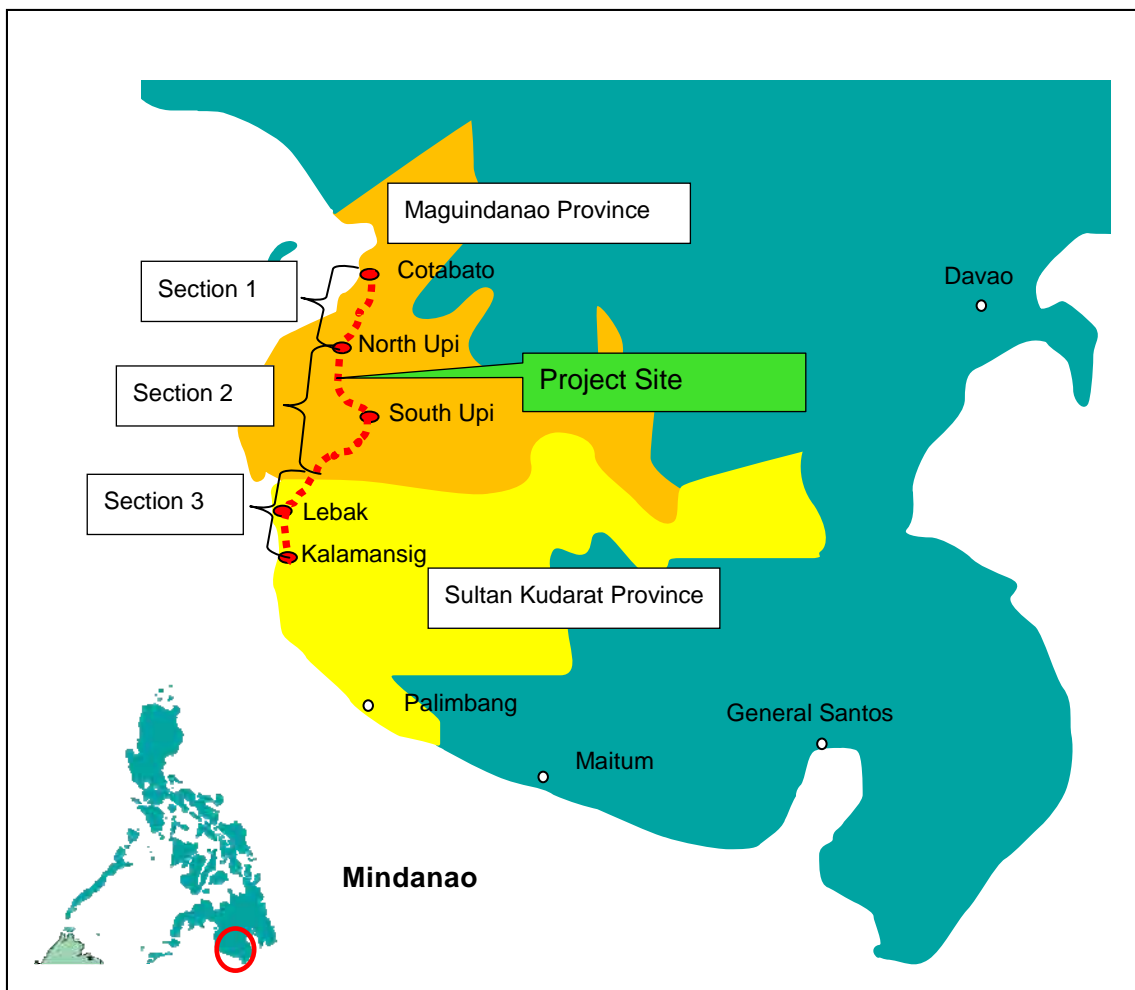


Figure1: Location Map of the Project Roads

3. Results of the Evaluation (Overall Rating: B²)

3.1 Relevance (Rating: ③³)

3.1.1 Relevance to the Development Plan of the Philippines

The Arroyo administration at the time of the project appraisal formulated “Medium-Term Philippine Development Plan (2001-2004)”, in which “supporting Philippine’s socioeconomic development through the provision of safe and reliable transport service” was listed as one of the development goals concerning the transport sector. In particular, the plan set the target of the paved road ratio to be achieved by 2004 through appropriate construction and maintenance. It said that 90% of the entire national arterial roads should be paved (70% paved as of 2000), and that 65% of the national secondary roads should also be paved (51% paved as

² A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

³ ③: High, ②: Fair, ①: Low

of 2000). As a priority task to achieve the target, the plan pointed out the development of higher-standard arterial roads (increase ratios of pavement and widening of roads) which link between local cities, which become regional economic centers, and neighboring areas. Furthermore, conflict affected Mindanao and impoverished areas were targeted as priority in the plan. The project is aligned with this policy since the project roads connect between the regional municipalities and Cotabato, the core city of southwestern part of Mindanao.

In addition, “Mindanao 2000 Development Plan (1996-2000)” put the highest priority on pavement and improvement of a road network since the poor quality of road increased transportation cost for agriculture, main industry of the region, and lost competitiveness.

At the time of the ex-post evaluation, “Mid-Term Philippine Development Plan (2011-2016)” also prioritizes infrastructure development of roads and bridges as they reduce transport cost in the agricultural area and revitalizes the economy. Current Aquino government sets target to achieve all national arterial roads to be paved by 2016. Furthermore, “promoting development of transport network in conflict-affected and highly impoverished areas” is recognized as priority areas since it contributes to opening up economic opportunities and helps solve peace and order problems. In addition, “Mid-Term Development Plan (2011-2016)” formulated by the Department of Public Works and Highways (hereinafter referred to as “DPWH”), the executing agency of the project, emphasized the importance of strategic development and operation & maintenance of transport infrastructure. In particular, the plan prioritizes the development of Mindanao as part of countermeasures of “Affirmative Action for Peace and Development”.

3.1.2 Relevance to the Development Needs of the Philippines

As mentioned in “1.1 Background”, the project is targeting one of the most underdeveloped and poorest areas in southwestern Mindanao⁴. The project was to improve and widen the existing roads. The section starts from Cotabato city, the core city of the southwestern Mindanao, to its southern province of Sultan Kudarat through ARMM region. Due to bad condition of the roads, the local residents along the roads, mostly farmers, suffered from limited access to market, which affected their income. There were many overloaded trucks to reduce the times of travel, which could damage road conditions. Besides, a disused part of the roads caused by the past conflicts prevented smooth traffic. The night travel was also limited due to the existing road condition and security. Therefore, the needs of improvement of the existing roads at the time of the project appraisal were high in terms of safety and security.

At the time of ex-post evaluation, “Mindanao Strategic Development Framework (2010-2020)” requires addressing the poverty situation in Mindanao and harnessing the full

⁴ According to the Poverty Statistics in 2000, the poverty ratio of Maguindanao Province (ARMM region) was 67.8% and the Sultan Kudarat Province was 57.0%, both of which were far behind 33.7% of the average rate of the total Philippines.

potential of its resources for economic growth. The Aquino administration emphasizes that there is no growth in the Philippines without peace in Mindanao. Establishment of roads network which connect agricultural area with the growth centers plays the important role for this purpose. At the time of the ex-post evaluation, the peace process for Mindanao was progressing and a comprehensive peace deal was signed between the Government of the Philippines and Moro Islamic Liberation Front (hereinafter referred as to “MILF”) in March 2014. In order to further facilitate the consolidation of peace, economic development of ARMM region including the project sites were indispensable. Thus, continuous high development needs exist to secure roads network to promote movement of goods and people which contributes to economic development.

3.1.3 Relevance to Japan’s ODA Policy

According to the appraisal reports, in April 2002, Japan International Cooperation Agency (hereinafter referred to as “JICA”) prepared the “Mid-Term Strategy for Overseas Economic Cooperation Operations” based on the development issues of the Philippines and the Japan’s assistance policy to the Philippines. In this document, sustainable growth and overcoming constraints of poverty reduction associated with it was put as one of priority areas. In order to achieve this, assistance in economic infrastructure development in the transport sector was set as strategy. In addition, establishment of major arterial roads in rural areas as an approach to overcome constraints for sustainable growth was listed in the “Country Assistance Strategy for Philippines” in October 2002. Thus, the project is in line with the Japan’s two strategies mentioned above, which raised overcoming constraints for sustainable growth, poverty reduction and narrowing gaps among regions as important issues.

Furthermore, “Building of Peace” is placed as one of priority issues in both ODA Charter in 2003 and Medium-Term Policy on ODA in 2005. The President Abe (at that time) announced J-BIRD (Japan-Bangsamoro Initiatives for Reconstruction and Development), which aims to promote peace in Mindanao and reconstruction and development of ARMM region, at the “50th Anniversary of the Japan-Philippines normalization of national diplomatic relations” in 2006. Thus, the project is highly relevant in terms of contributing peacebuilding.

Besides, the timing of the project was appropriate. The peace process of Mindanao has been moved forward since 2001. The ceasefire agreement was concluded in 2003 and international monitoring mission was decided to be dispatched from 2004. In this way, the project started during the progressive time of peace process and it would serve as commitment that would contribute to acceleration of consolidation of peace. In addition, the project was the first donor financed investment project for ARMM, and that it was the first project for Japan to assist infrastructure development for ARMM region.

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

3.2 Effectiveness⁵ (Rating: ③)

3.2.1 Qualitative Effects (Operation and Effect indicators)

(1) Operation Indicators: Annual Average Daily Traffic (AADT)

Table 1 shows the baseline and target which were set at the appraisal, and actual figure of annual average daily traffic (hereinafter referred to as "AADT"). Since the completion of the project delayed about one and half years, comparison cannot be made using the actual figure of 2010, which was originally set the target value (2 years after completion). However, it can be observed that the actual figure of 2013, after 2 years of completion of the project in December 2011 greatly exceeded the target set forth at the time of appraisal, therefore, it can be regarded that the original goal has been achieved.

Table 1: Operation Indicator

Indicator	Road Section*1	Baseline *1 (2001)	Target After 2 years of completion (2010)	Actual*1 (2013)
Annual Average Daily Traffic (vehicle/day)	Junction Awang, Cotabato (starting point) – Kalamansig, Sultan Kudarat Province (end point)	648	1,055	1,868

Source *1 : Information from JICA at the time of appraisal *2 : DPWH Planning Section

(2) Effect Indicators: Reduction of Travel Cost and Time

Table 2 shows baseline, target, and actual value of entire sections of project roads regarding Vehicle Operating Costs Savings (hereinafter referred to as "VOSC") and time saving. Actual recent figure of VOSC could not be obtained or estimated since the VOSC was not measured in the sections of ARMM region (Section 1 (Junction Awang – North Upi) and Section 2 (North Upi – Maguindanao/Sultan Kudarat Boundary) by DPWH under ARMM (hereinafter referred to as "ARMM/DPWH" ⁶)) and also DPWH Headquarters⁷ did not have data of roads under the jurisdiction of ARMM. The internal report of JICA which was formulated

⁵ Sub-rating for Effectiveness is to be put with consideration of Impact

⁶ Since ARMM is the autonomous, there is an organization (ARMM/DPWH) to undertake operation and maintenance of road of their areas under ARMM government. However, ARMM/DPWH has not always measured basic road information of neither AADT nor VOSC of their roads. Besides, a mechanism to share such road information between DPWH and ARMM/DPWH has not officially been established. Yet the relation between DPWH and ARMM/DPWH has been strengthened through the seconded arrangement of Undersecretary of DPWH to Secretary of ARMM/DPWH since January 2011.

⁷ The calculation of VOSC requires Basic Vehicle Operating Cost (BVOC) which has several variables such as costs of car, registration, fuel, labor, etc. However, at the time of the appraisal in 2003, BVOC was not available in DPWH and it is not clear how the target value of BVOC was calculated at the time of the appraisal. Therefore, it is not possible to compare actual figure with the set target, even if the actual figure can be calculated.

after the completion of the project, however, indicated VOSC figure as 789.59 million pesos/year in 2012, which exceeded the target. Although it is a reference figure, it is assumed that the effect of reduction of cost is realized.

Regarding time savings, travel time was 2.5 hours⁸ according to the actual measurement by travelling whole sections by the local consultant and the information received from the DPWH. Accordingly, the set indicator achieved the target and it can be said that travel time reduced significantly compared to the baseline of 8 hours.

Table 2: Effect Indicators

Indicators	Baseline ^{*1} (2001)	Target After 2 years of completion (2010)	Actual ^{*1} (2013)
VSOC (million pesos/year)	—	372.39	N/A
Travel time (hours)	8	2.5	2.5 ^{*2}

Source *1 : Information from JICA at the time of appraisal *2 : DPWH Planning Section



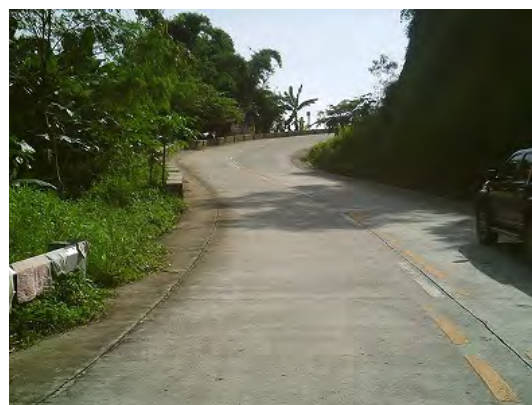
Junction Awang, Cotabato City



Section 1: Junction Awang - North Upi, Maguindanao



Section 2: Traffic Sign of winding (North Upi - Maguindanao/Sultan Kudarat Boundary)



Section 3: Maguindanao/Sultan Kudarat Boundary - Kalamansig

⁸ According to the relevant officials from DPWH, the travel time may vary within 1.5 – 2.5 hours according to the weather condition and traffic congestion.

3.2.2 Qualitative Effects

A beneficiary survey was conducted to assess effectiveness and impact by the project. The survey targeted local residents, farmers along the project roads and road users such as truck and bus drivers⁹. The number of the sample was 118.

(1) Improvement of access, reduction of transport cost, and improvement of convenience and safety of travel

Figure 2 shows the results of the beneficiary survey in terms of improvement of access, convenience and safety. All respondents (n=118, 100%) felt the improvement of the access after the project. It was also found that most of them raised “travel time reduction”, “increase in public transport” and “comfortable travel” as main reasons for that. Regarding the reduction of travel time, 73.5% (85 respondents) answered the travel time to go to major destinations such as hospital and market reduced about half compared to the time before the project¹⁰. The officials of DPWH also pointed out a great improvement effect on the access to hospital since after the project patients who had to be treated in district hospitals due to bad road conditions could be transferred to the larger regional hospital in Cotabato by ambulance. In addition, 76.3% (90 respondents) raised “reduction of travel cost” was one of reasons that they think the project improved the accessibility. Furthermore, a high percentage of respondents felt the improvement of “comfortable travel” (97.5%) and “traffic safety” (88.1%) because of improvement of road surfaces. On the other hand, 85 respondents (73.9%) answered that the traffic accidents increased. It is understood that speeding drivers have increased due to the improvement of the road surface by the project, although appropriate measures such as putting traffic signs was done by the project as well as DPWH maintenance team. Besides, the project roads have many curves, even sharp ones since they are situated in the mountainous areas.

⁹ A beneficiary survey was conducted at the three sections of the project. A total of 118 samples (Male: 71 (60.2%), Female: 47(39.8%)) was collected at random; 39 samples (M:28, F:11) from Section 1(Junction Awang –North Upi), 39 samples (M:23, F:16) from Section 2 (North Upi – Maguindanao/Sultan Kudarat Boundary) and 40 samples (M:20, F:20) from Section 3 (Maguindanao/Sultan Kudarat Boundary – Kalamansig). Data was collected through face to face interview. The age groups of the respondents were; 20s (19, 16.1%), 30s (33, 28.0%), 40s (34, 28.8%), 50s (20, 16.9%), and 60s and above (12, 10.1%). The occupation groups were; farmers (21, 17.8%), Day workers (18, 15.3%), Office workers (13, 11.0%), Retired (2, 1.7%), Housewives (6, 5.1%), Shop owners (29, 24.5%), Drivers (18, 15.3%), and Others (students, civil workers, teachers, etc.) (18, 15.3%).

¹⁰ More than 70% of each section answered the travel time reduced to half.



Ambulance heading to Cotabato City



Winding roads in the mountainous area
(Section 2)

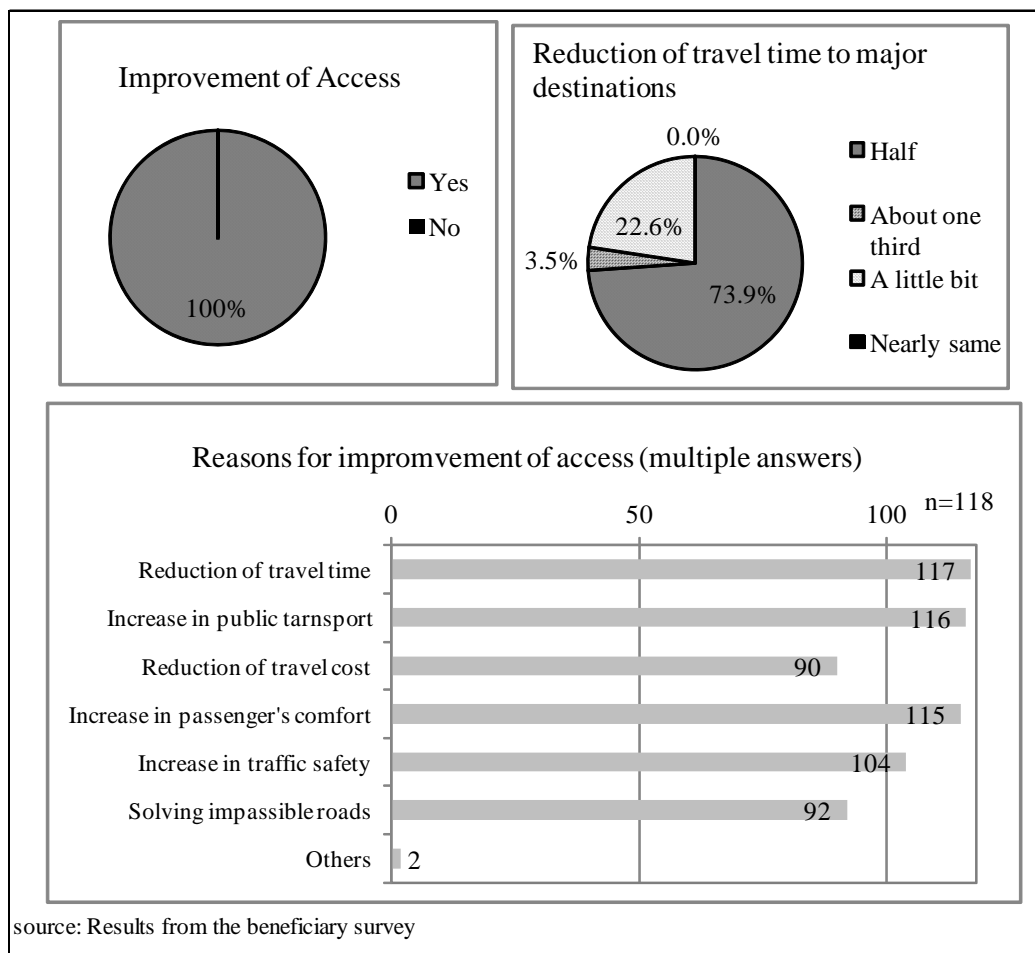


Figure 2: Improvement of access, convenience and safety

As seen in Figure 2, almost all the respondents answered “public transport increased” after the project. According to the interview to public transport drivers at the Cotabato bus terminal by the local consultant, number of public transports increased significantly as seen in Table 3. Before the project, the means of transport were limited between Cotabato and

Lebak and ferries were operated to cater for the demands of local residents. However, the level of convenience of ferries was as bad as the roads since it also took 7-8 hours to travel as well¹¹. After the improvement of the project roads, the operating vehicles per day increased significantly from 4 to 75. The frequency of travel increases more for Christmas and long holiday seasons. Thus, it was confirmed that the project contributed to enhancing the level of convenience for local residents and road users.

Table 3: Increase in Public Transport

Type of Car	Before	At the time of Ex-Post Evaluation
Double Tier Jeep (three kinds: 37, 41, 52 seats)	4 vehicles	20 vehicles (One round trip every day between Cotabato and Lebak)
Van (8-10 seats)	0	50 vehicles (One round trip every day between Cotabato and Lebak, Two round trips for the busy seasons)
Mini bus (54 seats)	0	5 vehicles (One round trip between Cotabato and Lebak)

Source: Results of interview to drivers of public transport at the bus terminal in Cotabato

Enhancing accessibility also contributed to the safety. About 8 km of the project roads was identified as bottleneck of the traffic and almost impassable due to damages caused by the past conflicts. This section was located in the mountain valley with poor visibility, so the cars could not pass through with normal speed. Then, the cars and people passing this section became easy targets for ambush by bandits and rebels¹². According to the interview to the local residents along the section, for the sake of security they used to avoid this 8 km and take a detour, even it took more than 12 hours. After the project rehabilitated the section, the section was connected as road network. The local residents commented to the beneficiary survey that solving problems of disused part contributed to improvement of their lives by reduction of travel time, enhancement of safety and easy transport of agricultural products and people.

Accordingly, the project produced great improvement in the lives of local residents in terms of reduction of travel time and cost, improvement of safety and convenience.

(2) The roles of roads at the time of natural disasters

According to the questionnaire results from relevant District Engineer Offices (hereinafter referred to as “DEO”) in charge of operation and maintenance of each section of project roads, the project roads played vital roles as immediate access to rescue, rehabilitation, and transport of relief and basic services at the time of serious flood near South Upi in September 2013. It

¹¹ Currently no ferries are operated since there is no demand.

¹² In fact, there were several incidents such as burglary attempts and ambush for military high ranking officials.

is confirmed, therefore, that the project roads becomes very useful and serves as important life line at the time of disasters.

Accordingly, it was confirmed that the project promoted movement of goods and people, improved access, and enhanced convenience by reducing travel time and cost. The project also contributed to improving security along the roads. The project road is also effective in terms of its role at the time of natural disasters, since the transportation of rescue and relief goods and people are vital especially in the areas susceptible to natural disasters such as floods and typhoons. A slight problem on traffic safety was identified, however, it was also confirmed that the executing agency has taken appropriate measures.

3.3 Impact

3.3.1 Intended Impacts

3.3.1.1 Promotion of Regional Economic Development and Revitalization

In order to confirm promotion of regional economic development and revitalization, the beneficiary survey to local residents and farmers were conducted. In addition, questionnaire survey to DEOs in each section under either ARMM/DPWH or DPWH was conducted. Table 4 shows the results of beneficiary survey on impact on regional economy¹³.

Table 4: Impact on Regional Economy

Questions	Responses (n=118)
Do you observe the enhancement of economic activities of the project area in general?	(1) Very much enhanced (72, 61.0%) (2) Enhanced (44, 37.3%) (3) Same as before (2, 1.7%) (4) Slow down (0%) (5) I do not know (0%)
Why do you think so? (n=98)	<ul style="list-style-type: none"> • New business and new shops (large supermarket and hardware shops) were emerged (30, 30.6%) • Distribution of goods including agricultural products became easier (24, 24.5%) • People's movement (tourists and consumers) were increased (21, 21.4%) • Convenience of transport was improved thorough increasing traffic (17, 18.0%) • Population was increased. (4, 0.51%) • Others (2, 0.02%) <p>Opportunities were expanded in every aspects Income from agricultural products was increased due to the time saving of transport.</p>

Source: Results from the beneficiary survey

Almost all respondents (116, 98.3%) answered that regional economy was either “very

¹³ GRDP (Gross Regional Development Production), growth rate of agriculture and transport sectors and major production (rice, corn and coffee) in the project regions were surveyed. However, the data indicating the changes after the completion of the project were not available. Therefore, the study(it が何を指しているのか明確でない) could not extract clear impacts from these indicators quantitatively.

much enhanced” or “enhanced” after the completion of the project. 30.6% (30 respondents) pointed out that “new business and new shops (large supermarket and hardware shops) were emerged”, 24.5% (24 respondents) for “increase in distribution of goods including agricultural products”, and 21.4% (21 respondents) for increase in “movement of people and tourists” as reasons for the revitalization of regional economy.

Table 5 exhibits the increase in business permits in the major municipalities of the project sites. Although it is not an impact only from the project, however, it can be thought that the project roads attracted the establishment of major business in particular, agricultural traders and retailers which have to secure freight routes. Therefore, it is considered that the increase in business permits is the contribution of the project.

Table 5: Increase in Business Permits

Municipality	2008	2014	Increase rate	Major Business
North Upi	250	316	+26.4%	<ul style="list-style-type: none"> • Retailers • Communications • Finance (Bank, Money Transfer)
South Upi	76	118	+55.2%	<ul style="list-style-type: none"> • Retailers • Agriculture Traders
Lebak	309 (2010)	522	+68.9%	<ul style="list-style-type: none"> • Retailers • Agriculture Traders • Finance (Micro Finance)

Source: Records and interview results from three municipalities

Regarding agriculture development, 108 respondents (91.5%) answered either “Very much enhanced” or “Enhanced” as shown in Table 6. Many respondents raised the reasons why they think the project promoted the agricultural development, such as “agriculture products could be easily transported in higher volume” (37 respondents) and “much more products are available in the market” (34 respondents). The DEOs of ARMM/DPWH and DPWH also felt that the project contributed to enhancement of regional development according to the questionnaire results. They have pointed out the reasons for the above such as “farmers could bring their products directly to urban market where they can charge higher prices”, “24 hours distribution became available by improvement of roads”, and “transport of agricultural and fishery products from coastal villages to major inland towns became possible”.

In this way, economic effect has been realized by improving access of the project roads. The project roads made it possible for farmers to transport their products easily in higher volume, which contributed to increase of the production. Besides, those agricultural products can be sold at urban markets with higher prices. It is also understood that the attainment of 24 hours transport enhanced the effect, while the transport at night time was very limited before

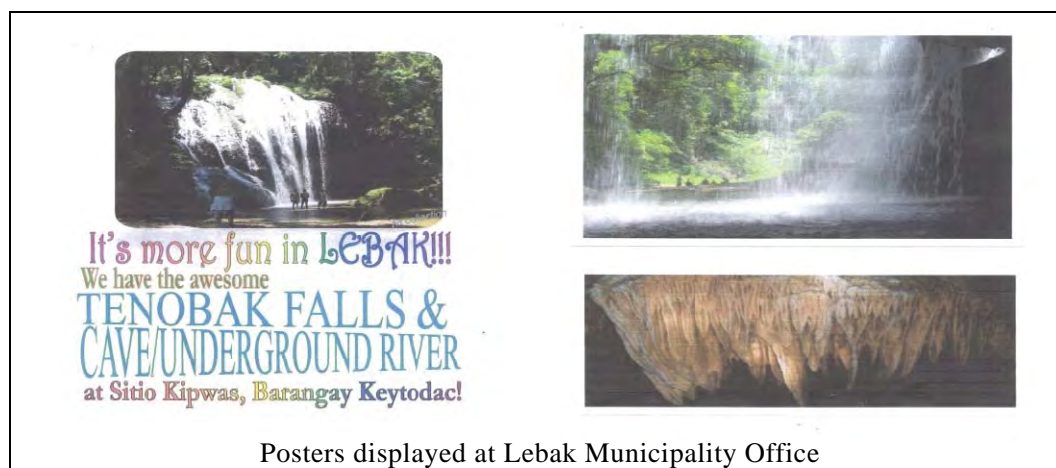
due to a safety standpoint (road surfaces and security issues).

Table 6: Impact on Agriculture Development

Questions	Responses (n=118)
Do you observe the effects on agriculture activities of the project areas after the project?	(1) Very much enhanced (67, 56.8%) (2) Enhanced (41, 34.7%) (3) Same as before (2, 1.7%) (4) Slow down (1, 0.8%) (5) I don't know (7, 5.9%)
Why do you think so?	<ul style="list-style-type: none"> • Agriculture products could be easily transported in higher volume (37, 31.4%) • More agricultural product produced (22, 18.6%) • Increased number of trucks for transporting products (8, 6.8%) • More variety of products is seen in the market (34, 28.8%) • Reduced cost to produce agriculture product (due to the reduction of transport cost) (3, 2.5%) • Others (Increased number of buyers of agricultural products, Introduction of new variety, etc.)

Source: Results from the beneficiary survey

Furthermore, the interview to the Lebak Local Government Unit (hereinafter referred to as “LGUs”) revealed that the attraction of tourists was one of priority issues for Lebak after increase in movement of people due to the improvement of roads. The posters have been developed by Lebak LGU and distributed to tourist companies and major towns such as Cotabato, South Upi and North Upi. The sample of posters is seen below.



When the project roads connects with General Santos city, the 8th most populous city in the Philippines¹⁴ after the completion of paving between Kalamansig and Palimbang, a road network among large cities, connecting Cotabato, the core city of southwestern Mindanao would be established. Then, further economic effect will be expected and the network will contribute to regional vitalization¹⁵.

¹⁴ Population of General Santos is 538,000. (Census in 2000)

¹⁵ At the time of the project appraisal, it was expected that the road network from Cotabato to General

3.3.1.2 Contribution to poverty alleviation

Table 7 indicates poverty incidence ratio among population in the province where the project locates. The impact on poverty reduction could not be assessed precisely with those available data since the latest figure was only 2012, which could not assess the trend after the completion of the project. Nonetheless, trends for poverty alleviation in the project provinces can be observed, though slowly, compared to that in the average of the Philippines.

Table 7: Change in Poverty Incidence among Population (%)

Area	2000	2012
Maguindanao Province	67.8%	63.7%
Sultan Kudarat Province	57.0%	48.5%
Philippines average	33.7%	19.7%

Source: National Statistics Authority

From the beneficiary survey results, 74.3% of the local residents along the project roads answered their income level has either “largely improved” or “improved” after the project as seen in Table 8. A variety of reasons to support the answer was raised. 86 respondents raised increase in agricultural production, while 85 respondents pointed out the efficiency of transport. As stated in the above, after the project farmers are able to transport agricultural production easily and in larger volume to the local as well as urban markets in the far distance, which led to the increase in production. It is, therefore, assumed that the project contributed to raising local farmers’ the income level by reduction of transport cost as well as increase in their production.

The beneficiary survey revealed that 97% of the respondents believed that the project either “very much promoted” or “promoted” the expansion of employment opportunities. In particular, employment opportunities for construction works were recognized as major opportunities by the respondents since construction projects including housing projects by the government were increased after the improvement of logistic aspects in terms of material transport.

Santos would have been established by the completion of the project. It was found that the construction works between Kalamansig and Palimbang had not been finished at the time of the ex-post evaluation. Therefore, it was not possible to assess the impact of the project as a road network connecting large cities. The pavement construction between Kalamansig and Palimbang (about 70km) has been undertaken by Region XII of DPWH Sultan Kudarat Province. At the time of the ex-post evaluation, there were still 36km more to be paved.. According to the DPWH, it will be completed by 2015. The section between Maitum and General Santos has been paved in 2011 with the financial assistance from United States Agency for International Development (USAID).

Table 8: Improvement of Income and Employment Opportunities

Questions	Responses (n=118)
Has the income level of your family improved compared to before the project?	(1) Largely improved (41, 35.0%) (2) Improved (46, 39.3%) (3) Same as before (25, 21.2%) (4) Decreased (6, 5.1 %)
What factors do you think affect most on improvement of income level? (multiple answers)	(1) Increase of agricultural production (86, 72.9%) (2) Price hike of production (70, 59.3%) (3) Improvement of efficient distribution (85, 72.0%) (4) Others (7, 5.9%) Success in small scale business (2) Increase employed drivers (2)
Do you observe the effects on increasing employment opportunities by the project?	(1) Very much promoted (54, 45.8%) (2) Promoted (60, 50.8%) (3) Same as before (1, 0.8%) (4) Slow down (1, 0.8%) (5) I do not know (2, 1.7%)

Source: Results from the beneficiary survey

3.3.2 Other Impacts

3.3.2.1 Impacts on the natural environment

The Environmental Compliance Certificate (herein after referred to as “ECC”) was issued by the Department of Environment and Natural Resources (herein after referred to as “DENR”) for all three sections of the project¹⁶, and the Environment Management Plan was complied with during the project implementation period.

During the implementation period, environmental monitoring was conducted by the monitoring team composed of DPWH, DENR, and LGUs of concerned province and municipalities, and project consultants. The monitoring activities were conducted every quarter and the results were compiled in the quarterly reports. During monitoring activities, the monitoring team conducted random interviews to local residents regarding environmental impact. It was confirmed that appropriate measures were taken by the project to minimize the environment effects during the construction. The project used equipment which had devices to mitigate air dust and noises. When carrying earth and sand, the trucks were covered by the tarpaulin, even splashed water to sands during the windy days. At the construction sites, enough number of sprinkler trucks was allocated for dust control. Interviews to the executing agency and the project consultant confirmed that no major complaint from the local community was recorded.

According to the beneficiary survey, on the contrary, 74.1% of local residents (86 respondents, n=118) answered that they felt adverse effects on environment. 86 respondents raised air pollution (including dust) and 87 respondents named noises during the construction. It was also noted that many pointed out adverse effects on environment even after the project. However, as stated above, it was confirmed that the appropriate measures were taken during

¹⁶ ECC was issued in October 2002 for Section 1 and Section 2, and in January 2003 for Section 3.

the construction. Judging from the interviews to DPWH and the project consultant as well as the report from the local consultant who conducted the field survey, it seems unlikely that there was adverse environment effect as revealed in the beneficiary survey. It is assumed that the answers of the beneficiary survey resulted from the impression of the difference in the surrounding environment before the project and during the project. It is because the project site was very quiet mountainous area without much traffic, particularly at night time. Therefore, it was concluded that there was no serious impact on environment.

3.3.2.2 Land Acquisition and Resettlement

The project did not have to acquire new lands, however, the acquisition of land required the widening of roads as well as removal of fruit trees along housing boundaries. Therefore, the compensation was paid by the executing agency to those houses and shops which were affected by the project¹⁷ (Project Affected Families (hereinafter referred to as “PAFs”). In the process for payment of compensation, the executing agency formulated a Resettlement Action Plan (hereinafter referred to as “RAP”) in August 2006 in accordance with the DPWH guideline (Infrastructure ROW Procedural Manual, April 2003), which is based on the Philippines Law.

The actual process for compensation for all three sections of the project including Section 1 and Section 2 under ARMM was implemented by the DPWH Regional Office XII which was in charge of Section 3 in Sultan Kudarat Province. Before the project implementation, multiple community consultation meetings were held for the PAFs both at the level of LGUs and barangay, the smallest administrative division. It was also understood that the complaints were handled in an appropriate manner by setting up claim desks with providing claim acceptance period and taking enough time for discussion. As a result, the amount of compensation was agreed with each PAF without much difficulty. The situation was the same in ARMM region. Public hearing and consultation meetings with the community were organized in cooperation with LGUs in ARMM. Instead, a strong cooperation with ARMM was built throughout the process such as Mayor of Maguindanao Province himself initiated public hearing for this purpose.

Therefore, it was confirmed that the project took appropriate processes for compensation and there were no particular problem.

Table 9 shows the actual compensation in each section.

¹⁷ Compensation was paid for belongings of project affected families such as their buildings, fences and fruit trees.

Table 9: Actual Compensation

Province	Municipality	Households of compensation
Maguindanao	Datu Odin Sinsuat	20
	North Upi	17
	South Upi	30
Sultan Kudarat	Lebak	45
Total		112

Source: Resettlement Action Plan

3.3.2.3 Impact on Peace and Security of the project area

The project was also implemented from the viewpoint of assistance of the post-conflict region. It was expected, therefore, to produce effect on peace and security in the region. According to the beneficiary survey as seen in Table 10, almost all respondents (113 respondents, 96.8%) answered that the project contributed to enhancing peace and security in the region. Half of the respondents who answered the above raised “improvement of access to military and police” as the main reason. Others also pointed out the reasons include “crime incidences such as ambush and hold-ups were reduced” (15.9%) and “24 hours transport became possible” (8.9%). In addition, 93.2% (110 respondents) replied that they thought the project contributed to promoting confidence building between ARMM and the Philippines government.

As seen from the above, many local residents felt the project was effective for security improvement and peace recovery in the region. It is considered the reason why they felt this was because local residents realized dividend of peace as a result of revitalization of local economy and security improvement which were brought by the project. In addition, the ARMM government stated in the questionnaire that the project was recognized as a proof of commitments from the Philippines government. Since many people in ARMM region thought they were left out from development by the Philippines government, it is understood that the project which also targeted ARMM region contributed to gaining the trust for the Philippine government from people in ARMM region. Accordingly, the project produced large impact on security of the project sites as well as contributed to restoration of peace in a certain degree.

Table 10: Impact on Safety and Security

Questions	Respondents (n=118)
Do you think the project roads have contributed to enhance peace and security in the region?	(1) Yes (113, 95.8%) (2) No (3, 2.5%) (3) I do not know (2, 1.7%)
Why do you think so?	< Yes > (n=113) • Access to military and police became easier. In case something happen, reporting to police also became easier and they could come quicker. (63, 55.7%) • Travel anytime even at night (10, 8.9%)

	<ul style="list-style-type: none"> • Reduced incidents such as hold-ups and ambush (18, 15.9%) • Others (Increase in people movement, NGO activities, immigrants from other provinces, and tourists, Installed street lights) (22, 19.5%)
Do you think the project contributed to promote confidence building between ARMM and the Philippines government?	(1) Very much (74, 62.7%) (2) To some extent (36, 30.5%) (3) No (1, 0.8%) (4) I do not know (7, 5.9 %)

Source: Results from the beneficiary survey

This project has largely achieved its objectives. Therefore its effectiveness and impact is high.

3.4 Efficiency (Rating: ②)

3.4.1 Project Outputs

(1) Civil Works

Comparison of planned and actual project outputs is summarized in Table 11.

Table 11: Comparison of Planned and Actual Project Outputs

Section*		Planned	Actual
1	Junction Awang, Cotabato - North Upi, Maguindanao	Widening and Pavement of total length of 27.5km i) AC Overlay*** on existing 14.6km ii) PCCP** on existing 12.9km gravel	PCCP and widening on 30.13km
2	North Upi - Maguindanao/Sultan Kudarat Boundary	Widening and Pavement i) PCCP on existing 32.6km gravel out of total length of 41.25km ii) Replacement of 1 temporary bridge with permanent bridge (24m)	i) PCCP and widening on 31.79km ii) No implementation
3	Maguindanao/Sultan Kudarat Boundary - Kalamansig, Sultan Kudarat	Widening and Pavement i) PCCP on existing 27.5km gravel out of total length of 36.11km ii) Replacement of 2 temporary bridges with permanent bridges (15m each)	i) PCCP and widening on 42.47km ii) Replacement of 3 temporal bridges with permanent bridges (total length of 42.96l.m.)
Total sections		- Widening and pavement of 87.62km out of total length of existing 104.86km. - Replacement of 3 temporal bridges with permanent bridges	- Widening and pavement of 104.39km. - Replacement of 3 temporal bridges with permanent bridges

* Section 1 was financed by own financial source of the Government of the Philippines, Section 2 and Section 3 were financed by Japanese ODA loan.

**PCCP : Portland Cement Concrete Pavement

***AC : Asphalt Concrete

Source: Information from JICA at the time of appraisal, results from questionnaire survey of executing agency, and interview survey results from the field survey

The main scope of the project is to widen and improve existing roads (including ditches and slope protection) and to replace temporal bridges to permanent ones along the roads. As

seen in Table 11, the total length to be improved was increased by 16.77km from the original 87.62km to the actual 104.39km. The main reason for the difference is aging degradation of the road surfaces from the time of the appraisals. Originally, the only necessary road sections were targeted for improvement (87.62 km out of total length of 104.86km). Since the actual implementation (2008) was made after five years from the appraisal (2003), the situation of the roads had been changed. In order to have an effective road network, there was a need to include sections which were deteriorated during that period. In addition, some sections which were damaged by the project construction were also included. In regard to a temporal bridge of Section 2, as seen in the photo below on the left, the project responded to construct a box culvert¹⁸ instead of replacing the temporal bridge¹⁹. Then, one more bridge was included in Section 3 because that had been deteriorated by aging. Accordingly, the changes of outputs are deemed appropriate for enhancement of effectiveness as a road network, in light of the actual situation at the start of the construction.



An old bridge on the left was abolished and the roads were rerouted with installment of a new box culvert (Section 2)



Rehabilitated Bridge 1, Section 3

(2) Consulting Services

The consulting services were implemented as planned. However it was noted that the actual man months (herein after referred as “M/M”) of the local consultant increased as shown in the Table 12. The main reason for the increase is because Section 1 was decided to be implemented with the finance from the Philippines government. The detail is explained in the next section of “Input”. Planned assignment for foreign consultants for Section 1 was, thus, transferred to local consultants with some increase of M/M. In addition, due to safety management, local consultants resided at the construction sites instead of foreign consultants. Accordingly, the changes of inputs of consulting services are deemed appropriate in light of

¹⁸ Box culvert is structure of corridor for water flow and drainage that is buried under a road, railway, and dike.

¹⁹ The actual construction was implemented two years after the detailed design.

the actual situation at the start of the construction.

<Planned consulting services>

- Detailed Engineering Design, Assistance in tendering, Construction supervision
- Environment monitoring necessary for environmental consideration
- Assistance to DPWH in review, preparation and implementation of RAP and its monitoring
- Assistance to DPWH in coordination activities with the concerned Provincial Government, the ARMM government and LGUs
- Technical Transfer (design for slope protection works in mountainous areas and supervision)

Table12: Comparison of Planned and Actual Inputs of Consulting Services (M/M)

	Plan	Actual	Comparison
Foreign	49	55.34	Increased by 6.34
Local	822	1,462.7	Increased by 640.7
Total	871	1,518.04	Increased by 647.04

Source: Information from JICA at the time of appraisal, results from questionnaire survey of executing agency, and interview survey results from the field survey

3.4.2 Project Inputs

3.4.2.1 Project Cost

Total project cost was initially planned to be 4,956 million yen (out of which 3,717 million yen was to be covered by Japanese ODA loan). In reality, the total project cost was 4,996 million yen (out of which 3,165 million yen was covered by Japanese ODA loan), which is higher than planned (101% of the planned amount).

The main reason for project cost overrun was due to inflation (cost of basic construction inputs increased throughout the project implementation period despite a depreciation of local currency (Philippines peso)). The increased portion was covered by the DPWH budget and there was no particular problem.

3.4.2.2 Project Period

The overall project period was planned as 79 months, from December 2003 (conclusion of Loan Agreement) to June 2010 (completion of civil works). In reality, the overall project period was 97 months, from December 2003 (conclusion of Loan Agreement) to December 2011 (completion of civil works), which was longer than planned (123%).

Table 13 shows the comparison of planned and actual project period.

Table 13: Comparison of Planned and Actual Project Period

Item	Planned(At Project Appraisal)	Actual (At Ex-post Evaluation)
1. Selection of consultants	Jan. 2003 – Dec. 2003	Sep. 2003 – Sep. 2004
2. Detailed design	Jan. 2004 – Dec. 2004	Sep. 2005 – Sep. 2006
3. Bidding process	Aug. 2004 – Oct. 2005	Sep. 2006 – May 2009
4. Civil works	Oct. 2005 – Jan. 2008	Nov. 2008 – Dec. 2011
5. Land acquisition	Jul. 2004 – Sep. 2005	N.A.
6. Consulting Services	Jan. 2004 – Jan. 2008	Sep. 2005 – Dec. 2011

Source: Information from JICA at the time of appraisal, results from questionnaire survey of executing agency, and interview survey results from the field survey

The main reasons of delay are listed below.

- Due to growing budget deficits in the Philippines government at that time, the budget allocation to the executing agency was delayed²⁰. As a result, the selection of consultants was delayed (for 11 months).
- It was the first project for the division in charge of the project²¹ to implement RAP. More time was required, therefore, to coordinate with different divisions of DPWH for selection process of RAP consultant (delayed for 6 months).
- Selection of contractors took more time (delayed for 12 months). Initially, tendering of contractors for each section was made as 3 packages. However, as a result of tendering, it was found that the overall bidding price was exceeded the total budget of Japanese ODA loan. It was decided, therefore, that one of three sections was excluded from the finance by Japanese ODA loan. Instead the section was financed by the Philippines government. However, it took more time to decide which package should be taken by the own finance. It was settled that Section 1 was excluded from the finance of Japanese ODA loan. Other than this, the Japanese side delayed to provide consent for the selection of contractors because it took more time than usual for thoroughly review of the results of pre-qualification of contractors.
- The start of the construction of Section 2 was delayed since it took extra time to select a contractor due to withdrawal by the first awarded contractor and to renegotiate with the second lowest bidder (delayed for 17 months).
- Since there were more rainy days than initially envisioned, it affected the construction works (delayed for 1 month).

3.4.3 Results of Calculations of Internal Rates of Return (Reference Only):

Economic Internal Rates of Return (EIRR)

At the time of the appraisal, EIRR was calculated by considering reduction of travel cost and time, and saving on maintenance cost as benefits, construction cost and maintenance cost

²⁰ According to the executing agency, the effect from the austerity policy at that time affected the delay in budget allocation.

²¹ Rural Road Network Development Project: RRNDP

as costs, and with the project life of 20 years. As a result, EIRR was calculated as 34.46%.

On the other hand, it was difficult to recalculate EIRR at the time of ex-post evaluation because neither DPWH nor ARMM/DPWH have Basic Vehicle Operating Cost (refer to reduction of travel cost in “effectiveness”) after the project completion which is essential for the calculation.

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

3.5 Sustainability (Rating: ②)

3.5.1 Institutional Aspects of Operation and Maintenance

The actual operation and maintenance (hereinafter referred to as “O&M”) for each section of the project roads is undertaken by each DEO under ARMM/DPWH for Section 1 and Section 2, and DPWH for Section 3. In concrete, 1) Maguindanao 1st DEO is in charge of Section 1 (Junction Awang, Cotabato - North Upi, Maguindanao), 2) Maguindanao 2nd DEO is in charge of Section 2 (North Upi - Maguindanao/Sultan Kudarat Boundary), and 3) Sultan Kudarat 2nd DEO is in charge of Section 3 (Maguindanao/Sultan Kudarat Boundary - Kalamansig, Sultan Kudarat)²².

At the national level, Bureau of Maintenance (hereinafter referred to as “BOM”) in DPWH Headquarters is responsible for formulating overall policy and objectives of O&M of roads and bridges. At the regional level, Regional Office of DPWH is responsible for its respective roads and bridges. DEO is supervised by respective Regional Office. Sultan Kudarat 2nd DEO for Section 3 is under supervision of DPWH Regional Office XII. While, in the areas covered by ARMM, Maguindanao 1st and 2nd DEOs are under direct supervision of ARMM/DPWH.

Table 14 shows the number and category of O&M staffs in each DEO.

Table 14: O&M Staffs in each DEO

DEO	i) Maguindanao 1 st DEO	ii) Maguindanao 2 nd DEO	iii) Sultan Kudarat 2 nd DEO
Section	Junction Awang, Cotabato - North Upi, Maguindanao	North Upi - Maguindanao/Sultan Kudarat Boundary	Maguindanao/Sultan Kudarat Boundary - Kalamansig, Sultan Kudarat
Category			
Engineer III, II	3	5	2
Construction and Maintenance Foremen • Capataz	3	4	4
Draftsman	-	1	-
Mechanical Engineer	-	-	1

²² The covering road length of each DEO is 1) Maguindanao 1st DEO: 143km, 2) Maguindanao 2nd DEO: 136km and 3) Sultan Kudarat 2nd DEO: 265km.

Engineering Assistance	2	-	-
Mechanic II	-	-	1
Heavy Equipment Operator	-	-	4
Total	8	10	12
Maintenance Crew	38	29	N.A.

Source: Results from questionnaire survey of each DEO, and interview survey results from the field study

Two DEOs in ARMM region, Maguindanao 1st and 2nd DEOs, were actually established after separation of one DEO since the covering areas were too large. At the time of ex-post evaluation, both offices were in the process of strengthening organization structure. Several permanent posts of staff were awaiting approval. Therefore, some unapproved posts were filled by the contracted employees. According to the results from questionnaire to Maguindanao 2nd DEO, they require 8 Engineers and 4 Assistant engineers but the actual numbers at the time of ex-post evaluation were 5 and 0 respectively, which indicated the shortage of staff. However, the trend toward improvement of the situation has been observed by confirming that the recruitment of new permanent staff has been started for the approved posts.

It was uncertain at the time of ex-post evaluation regarding the administration structure of ARMM/DPWH after 2006. ARMM is going to replace to “Bangsamoro”, new administration after 2016 which was resulted from the comprehensive peace agreement concluded in 2014.

The number of permanent posts of Sultan Kudarat 2nd DEO for Section 3 was decreased due to the government streamlining policy²³. In order to fill gaps of the shortage of staff, temporal staff is being recruited so that the O&M activities are not affected. For example, one out of two engineers and one out of four heavy equipment operators in Sultan Kudarat 2nd DEO were temporal employees.

Regarding site workers in charge of actual routine/periodic maintenance work for roads and bridges (responsible for cleaning, vegetation control, road repair etc.) have been employed from the local residents as Road Maintenance Crew (herein after referred to as “RMC”). This RMC system has been utilized as a part of social welfare approach for poor families (employment creation and household income support) under collaboration between DPWH and Department of Social Welfare and Development. The number of RMC²⁴ in the Table 14 at the time of ex-post evaluation is generally considered as enough.

Accordingly, there are some concerns in organizational stability for the two DEOs under

²³ Since 2013, DPWH is conducting “Rationalization Plan” at all levels by streamlining staff through encouraging early retirement at nationwide. According to the interview to Bureau of Human Resources and Administrative Services, the approval for new posts will be very difficult under this plan.

²⁴ Number of RMC was not confirmed by the questionnaire to Sultan Kudarat 2nd DEO since it stated that they recruited RMC according to the needs.

ARMM/DPWH. Additionally, the number of staff for O&M found to be limited in a certain degree in all three DEOs.

3.5.2 Technical Aspects of Operation and Maintenance

The main works of maintenance conducted by DEOs are vegetation control (weeding on road shoulders), ditch cleaning, repair of small cracks of road surface, removal of landslides, culvert cleaning, etc. The maintenance is done in accordance with the standard manual of “Philippine Highway Maintenance Management System”.

Regarding training of the DEO O&M staff, on the job training (OJT) is the most common practices in all three DEOs. On top of OJT, DPWH has a training program at the national level for DEO staff organized by the Bureau of Human Resources and Administrative Services. The trainings are conducted every year inviting 2-3 DEO officers to the DPWH Headquarters based on the annual training program²⁵. On the contrary, DEOs in ARMM are different situation. They do not have a regular training system. O&M manuals were not appropriately equipped in Maguindanao 2nd DEO. These circumstances become constraining factors to implement O&M activities fully since there is request to upgrade and renew their skills to cope with new O&M demands. Since the recruitment process for permanent staff has been on-going at the Maguindanao 1st and 2nd DEOs, it is expected that an institutionalized training system be established²⁶.

Regarding O&M equipment, all three DEOs answered to the questionnaires that necessary equipment was rented from the Regional office or LGUs since the equipment in DEOs was either aging or lacking. It was confirmed, however, the equipment of all three DEOs was expected to be renewed within 2014. For equipment of DEOs under DPWH, with the initiative of “Equipment Procurement Program²⁷”, aged essential equipment such as heavy machinery of all DEOs is to be replaced. Currently the assessment study of each DEO has been underway and the replacement has been started. New equipment for Sultan Kudarat 2nd DEO will be put in place by the end of 2014²⁸. However, since the new equipment is the latest model, it should be noted that the DEO has to secure or train staff members for operation and maintenance of the new equipment.

Maguindanao 1st DEO will also receive new equipment for O&M within 2014. The equipment will be shared with Maguindanao 2nd DEO for the time being²⁹.

Staff members in all three DEOs have appropriate level of technical skills to conduct O&M

²⁵ If there is a specific subject to be trained, DEO can place a request to DPWH Headquarters through its Regional Office. The approval will be depending on availability of budget and lecturer.

²⁶ According to DPWH, they can share syllabus and send a paid resource persons if ARMM/DPWH requests.

²⁷ Program period is for 5 years from 2012 to 2016.

²⁸ Normal dumper truck, Wheel loader, Excavator, etc.

²⁹ Offices of Maguindanao 1st DEO and 2nd DEO are located in the same compound in Cotabato. Therefore the coordination of sharing equipment can be arranged easily.

activities. However, it should be noted that there is room for improvement in general to provide the staff members with new skills and establish a training system in two DEOs under ARMM/DPWH.

3.5.3 Financial Aspects of Operation and Maintenance

Table 15 shows the budget of three DEOs in the year of 2013 and 2014.

Table 15: O&M Budget of each DEO (2013, 2014)

(Unit: Peso)

DEO	Year	Planned (2012)	Actual	Difference (%)
Maguindanao 1 st DEO	2013	4,911,791	2,774,322	56.4%
	2014	5,010,026	2,774,322	55.4%
Maguindanao 2 nd DEO	2013	5,182,404	6,793,048	131%
	2014	5,286,052	6,793,048	129%
Sultan Kudarat 2 nd DEO	2013	6,971,433	9,062,863	130%
	2014	7,180,575	9,334,749	130%

Source: Results from questionnaire survey of each DEO, and interview survey results from the field study

The budget for O&M is calculated by multiplying Equivalent Maintenance Kilometer (hereinafter referred to as “EMK”)³⁰ by basic cost (cost required to operate and maintain one kilometer of road for one year). According to BOM of DPWH, the budget calculated using EMK is found to be the minimum amount for routine maintenance. The extra budget is usually required for periodic maintenance and major repair. The request for the extra budget is placed to either Regional Office or DPWH Headquarters. In addition, the unit costs used to determine EMK have not been updated, as a result, the amount of budget becomes lower than actually amount required³¹.

As seen in Table 15, two DEOs received more amount of budget than planned. However, as the unit costs which is the basis for calculation of EMK, do not fit the current reality, it cannot be said, therefore, that there is enough O&M budget. Besides, it was found that EMK of ARMM/DPWH was different from that of DPWH. EMK of ARMM/DPWH (74,685 pesos) is only 70% of EMK of DPWH (109,000 pesos). This means that the maintenance unit cost for Section 1 and Section 2 is lower than that for Section 3 despite all sections are continuous roads under the same project³².

Although it cannot be said that enough budget has been allocated for O&M to the

³⁰ EMK is calculated based on several variables such as road length, surface type, AAVT, etc.

³¹ According to DPWH and JICA experts dispatched to DPWH, for example, the unit cost for weeding is still based on the manual weeding, although the actual practice of weeding is done by weeding machine.

³² It is assumed that ARMM/DPWH is using older unit costs when calculating EMK, but it could not be clarified.

concerned DEOs, this does not prevent conducting required works for O&M³³. At the time of ex-post evaluation, however, there is a concern in terms of different amount of EMK between ARMM/DPWH and DPWH. The coordination efforts from both organizations are required.

Accordingly, it is admitted that there is concern to a certain degree for O&M budget of this project (financial aspect).

3.5.4 Current Status of Operation and Maintenance

Each DEO formulated its annual maintenance plan and conducted maintenance activities based on the plan. It was confirmed from the answers to questionnaires to each DEO, interview results from the officers of DPWH who were in charge of the project, actual observation by the local consultant, and photos of the project sites, that there was no serious damage that affects smooth traffic on the roads and bridges which were improved by the project. However, some damages on the road surface (breakage, dent, cracks, etc.) were observed in all sections, although they were small scales (within 5 km wide in a larger size). It was confirmed that repair of the serious damaged road sections had been promptly undertaken by relevant DEOs with secured finance. It is expected that other parts of damaged should be responded in the same manner.



Damage on the Road Surface (Section 1)



Maintenance Activities (Section 2)

Some problems have been observed in terms of institutional, technical and financial aspects. Therefore, sustainability of the project is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The Project upgraded existing rural roads of southwestern Mindanao with the aim of securing a safe and efficient road network in the surrounding areas. The project objective - to

³³ BOM has well recognized the budget deficiency for DEOs.

stipulate and revitalize local economy as well as to ensure stability of the region by improving connectivity through facilitation of movement of goods, services and people between rural communities in the major cities and towns of the central Mindanao – is consistent with the development policy of the Philippines and with the development needs both at the time of the appraisal and ex-post evaluation, as well as Japan’ ODA policy at the time of appraisal. Besides, from the viewpoint of peacebuilding, the timing of the implementation of the project was appropriate; thus, the relevance of the project is high. Annual average daily traffic far exceeded the target and travel time was reduced as expected. A beneficiary survey confirmed that the benefits of the project (improving the access to markets and hospitals, reduction of transport cost, improving security and safety) were recognized by local residents and road users. Furthermore, the project contributed to the improvement of the standard of life of local residents through agriculture promotion, one of the main industries of Mindanao, and revitalization of economy as a result of the improvement of efficiency of distribution; thus, the project’s effectiveness and impact are high. On the other hand, both project cost and project period exceeded the plan; thus, efficiency is fair. In regard to operation and maintenance, no major problems have been observed. However, there is room for improvement on institutional and technical aspects such as establishment of training system to upgrade technical skills for the staff in ARMM; thus, sustainability of the project is fair.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency³⁴

- Institutionalization of cooperative relations between DPWH and ARMM/DPWH

The relations with ARMM/DPWH have been strengthened since Undersecretary of DPWH was seconded as Secretary of ARMM/DPWH in January 2011. Annual meeting is held and discussions are made, but as needed basis, between the two. However, the cooperation relations have not been institutionalized yet. There is no mechanism to share basic road information such as AADT and VOC, although those data are not measured in the ARMM region. In addition, ARMM/DPWH is using different value of EMK from that of DPWH. Basic data on roads and bridges in ARMM region are also important for DPWH to promote road development and conduct various analyses. A different standard of maintenance by road section in the same project roads should be avoided. It is desirable to institutionalize cooperative relations between ARMM/DPWH and DPWH for establishing closer coordination mechanism and implementing effective road development and O&M, although it depends on the new arrangement of Bangsamoro administration scheduled to start after 2016.

³⁴ Executing agency of the project is DPWH. However, recommendations to ARMM/DPWH are included since O&M of Section 1 and Section 2 of the project road is conducted by the DEOs under ARMM/DPWH.

- Implementation of necessary repair for damaged road sections in an early manner

Some damages on the road surface (breakage, dent, cracks, etc.) were observed in all sections, although they do not require major repair. However, it is recommended to implement necessary repair as soon as possible before affecting smooth traffic.

- Establishment of a mechanism to maintain and enhance technical skills of DEOs in ARMM/DPWH

In DEOs under ARMM/DPWH, trainings on O&M are basically conducted by OJT and skills and knowledge have not been updated to cope with new methodologies. Since the new recruitment for permanent officers are on-going, a training system to maintain and strengthen skills and knowledge on O&M should be established without delay in ARMM/DPWH. Utilization of resources from DPWH would be one of the options.

- Consideration of institutionalizing “Advance Procurement System” into DPWH

Delay of most road and bridge projects in the Philippines stems largely from the delay in selection process of consultants and contractors. The project also experienced delay in selecting consultants. In order to cope with the situation, currently JICA and DPWH have been implementing “Advance Procurement System” as a trial basis. As soon as pledge is made by the Government of Japan, DPWH starts procuring process of consultants for detailed design. After formally signing a Loan Agreement, DPWH awards the consultant, so that the consultant can commence works within 6 months after signing of Loan Agreement. If this system can be applied to loan projects finance by other donors, institutionalizing it into DPWH is worth considering.

4.2.2 Recommendation to JICA

- Enhancement of support systems to compliment O&M capacity of ARMM/DPWH

O&M capacities of DEOs under ARMM/DPWH, in particular, in technical aspects is found lower compared to that of DEOs under DPWH. Considering the fact, it has been assumed by the project that the support would be provided from DPWH (either Region XII office or Headquarters) to relevant DEOs under ARMM/DPWH in terms of technical and financial aspects of O&M. However, it is difficult in practice to establish such cooperative relations without having an institutionalized cooperative mechanism between the two.

Therefore, it is desirable to enhance support system to compliment O&M capacity of ARMM/DPWH by including a supplementary component of technical assistance into loan project, or cooperating with JICA technical cooperation projects to obtain advice from the experts when conducting road improvement projects in ARMM region, although it is

depending on the new administration structure of ARMM/DPWH under Bangsamoro administration after 2016.

4.3 Lessons Learned

- Roads can play important roles for improvement of security and restoration of peace in the region

Before the project, cars and trucks were used to drive slowly on the project roads since the roads were rough and winding in the mountainous situation, which attracted bandits and rebels to commit crimes. The project brought large impact not only on accessibility but also on security aspects. Improvement of security as a result of reduction of incidents of crimes and attacks enhanced feeling of safety among local residents and contributed to recovering peace and security in the region in a certain degree. It is vital to consider such impacts that roads can produce when selecting and formulating projects conducted in conflict affected and poor security areas. However, it should be reminded that appropriate measures should be fully taken to ensure safety during construction period.

END

Comparison of the Original and Actual Scope of the Project

Item	Original	Actual
1. Project Outputs	<p>1) Civil Works</p> <ol style="list-style-type: none"> 1. Junction Awang, Cotabato - North Upi, Maguindanao: Road (27.5km widening, 14.6km on PCCP, 12.9kmon AC) 2. North Upi - Maguindanao/Sultan Kudarat Boundary: Road (32.6kmon PCCP) , Bridge: (1, 24m) 3. Maguindanao/Sultan Kudarat Boundary - Kalamansig, Sultan Kudarat: Road (27.5km on PCCP), Bridge (2, 15m each) <p>2) Consulting Services</p> <ol style="list-style-type: none"> a) Detailed Engineering Design b) Assistance in tendering c) Construction supervision d) Environment monitoring necessary for environmental consideration e) Assistance to DPWH in review, preparation and implementation of RAP and its monitoring f) Assistance to DPWH in coordination activities with the concerned Provincial Government, the ARMM government and LGUs g) Technical Transfer (design for slope protection works in mountainous areas and supervision) 	<p>1) Civil Works</p> <ol style="list-style-type: none"> 1. Junction Awang, Cotabato - North Upi, Maguindanao: Road (30.13km on PCCP) 2. North Upi - Maguindanao/Sultan Kudarat Boundary : Road (31.79km on PCCP), Bridge (0) 3. Maguindanao/Sultan Kudarat Boundary - Kalamansig, Sultan Kudarat : Road (42.47km on PCCP), Bridge (3, 42.96m) <p>2) Consulting Services</p> <p>Necessary tasks have been implemented as planned, however, the services targeted Section 1 was managed directly by the executing agency utilizing GOP fund.</p>
2. Project Period	December, 2003 – June, 2010 (79 months)	December, 2003 – December, 2011 (97 months)
3. Project Cost		
Amount paid in Foreign currency	1,946 million yen	3,165 million yen
Amount paid in Local currency	3,010 million yen (1,254 million pesos)	1,831 million yen (924 million pesos)
Total	4,956 million yen	4,996 million yen
Japanese ODA loan portion	3,717 million yen	3,166 million yen
Exchange Rate	1 peso = 2.4 yen (As of August, 2002)	1 peso = 1.92 yen (Average between 2002 to 2011)

Column: Contribution from the Perspective of Peacebuilding

The project was also implemented from the perspective of assistance for post-conflict region although it was not clearly mentioned in its objective. Reviewing the project again from the perspective of peacebuilding, the following three points were extracted as contribution to peacebuilding.

(1) Relevance:

The evaluation of the project conducted in conflict affected countries/regions confirms the appropriateness of the timing of the project commencement considering the relations with progress of peace process, and local political, security and social situations. Besides the relevance of the timing, the contribution to political and diplomatic policy of recipient country and Japan is also assessed since it is highly expected in the project related to peacebuilding.

The year that the project conducted appraisal and signed a loan agreement is the same year that a cease-fire agreement was concluded as a result of peace negotiation between the Philippines government and the MILF which started 2001. The International Monitoring Team has been dispatched since 2004. Accordingly, the commencement of the project is matched with the timing in which the peace process was in progress. The timing was also appropriate in a sense that the Philippines government could show a proof of commitment to MILF through implementing the project since it started just after the peace agreement.

In addition, Prime Minister Koizumi (then) announced “Support Package for Peace and Stability in Mindanao” when President Arroyo (then) visited Japan in December 2002. Its particular emphasis was placed on the ARMM, a region seriously affected by local strife, and thereby delayed in its development. The project served as the output of the above package. Furthermore, the project enhanced the reputation of Japan and produced diplomatic impact since the project was the first donor assisted tangible investment project in ARMM which would realize “peace dividend”. On the other hand, the modality which was taken for the project was thought to be appropriate since no other scheme was accommodated at that time.. It was the first infrastructure development project for Japan to implement in ARMM region where security was not fully restored. Considering unstable situation, the project used a loan assistance modality which can utilize local resources without Japanese consultants residing at the construction site.

(2) Impact 1: Changing from “Crossing Kamataya” to “Road of Peace”

As seen in the ex-post evaluation report, improvement of security of the project area was observed as one of impacts of the project. It is also considered as an impact from the

perspective of peacebuilding.



Before the project, the target roads were rough dirt roads in mountainous area. There was no slope protection and frequent land slide was experienced. Cars could only travel at the speed of 5-10 km/h and there were robbery and attacks by bandits and rebels. According to the local residents along the roads, they could not travel at night

by car because the road condition was bad and they feared possible attacks. As stated in the report, in particular, there was a section in the southwest of Cotabato city that traffic was almost impossible due to damages caused by the past conflicts. According to the field survey conducted by the local consultants and interview to DPWH, this section was located in the mountain valley with poor visibility, so the section became “ambush point” by bandits and rebels who were hiding in the bush or waiting on the top of the hill. In fact, tragic incidents also occurred twice. Several military officers including high ranking officers from the Philippines government were killed at this section. Therefore, this section was named “Crossing Kamataya” (crossing death) by local residents. Many people avoided this section and detoured even if it took 12 hours. The roads of this section were paved and slope protections were also constructed for dangerous parts. Currently there is no obstacle for visibility and traffic can move with normal speed without fear of attacks (refer to a photo above).

The beneficiary survey to the local residents and road users revealed that 95.8% (113 out of 118 respondents) answered “yes” to the question, “Do you think the project roads have contributed to enhancing peace and security in the region?” The following reasons were raised for the answer; “In case something happens, military and police became able to come without delay, or, local residents became able to report to them” (55.7%), and “Incidents such as holds-ups and ambush were reduced” (15.9%). Accordingly, such improvement effect on security by the project also contributed to mitigation of destabilizing factors for security such as “conflict between clans” and “armed conflict by rebels” which had been happened in the region. It was confirmed that the project brought impact from the perspective of peacebuilding since the local community felt safety after the project and the project contributed to realizing peace dividends. Some of local residents call the project roads as “Road of Peace”. The project contributed to eliminating the fear of local residents and remains in the hearts of people.

(3) Impact 2: Enhancement of Trust to the Philippines government

Another impact that was observed is enhancement of trust to the Philippines government. One of the factors of Mindanao dispute is the economic disparity at the national level as well as at the regional level of Mindanao. It is also understood that factors for underdevelopment of Mindanao are government policy towards Mindanao and security issues caused by prolonged civil conflicts³⁵. In addition, the Philippines government promoted plantation in Mindanao through encouragement of immigration from Visayan and Luzon islands based on the immigration preference policies³⁶ since the colonial era. Accordingly, the indigenous inhabitants and Muslim people were droved from fertile lands to remote areas where agriculture productivity was low. Muslim people who had lost their lands had to lead hard life. Accordingly, poverty rate in the regions where many Muslim and indigenous reside, especially ARMM region, became higher than other regions. Despite this situation, Mindanao has not received appropriate amount of public funds from the Philippines government. As a result, there had been delay in development of basic infrastructure including access roads to markets, and decline in agriculture productivity and farmers' income. Accordingly, feeling of distrust and dissatisfaction towards the Philippines government has been growing, and this became one of causes of the conflict.

Both DPWH and ADB analyze that the project contributed to restoring trust to the Philippines government from ARMM people who had felt marginalized from the development. Although the project was financed by Japan, it was acknowledged that the project has been implemented as a development project by the Philippines government and brought economic vitalization in the region. In addition, as seen from the above, the project was commenced just after concluding the peace agreement, therefore, it is believed that the commitment of the project became an indication of seriousness of the Philippines government towards promoting reconstruction of Mindanao.

On the other hand, the project enhanced trust between ARMM government and Philippines government according to the interviews to DPWH officers. The project was executed mainly by DPWH but activities such as compensation issue was implemented in cooperation with LGUs in ARMM region, which strengthened the relations between the two. In fact, Mayor of Maguindanao Province in ARMM region was very cooperative such as by explaining the project from his initiative at the consultation meetings. Local residents also found that the

³⁵ According to the JICA internal material, four reasons are pointed out for underdevelopment of Mindanao referring to the analysis done by Professor Adria. 1) Mindanao serves as supplier of materials and agriculture products, 2) the Philippines government had not responded to needs of infrastructure development, 3) the government continued agriculture centered policy, and 4) security deterioration by the conflict.

³⁶ Immigration into Mindanao from Visayan and Luzon islands was initiated by the policy under colonial government since 1920 and associated with plantation business headed by the US originated multinational companies. Even after the independence from the United States, the Philippines government continued to encourage impoverished people in Visayan and Luzon to immigrate into Mindanao under immigration preference policy in order to ease social unrest of them.

relations between the two governments have been strengthened by the project according to the results from the beneficiary survey. In total 99.1% of the respondents either “very much” for 66.7% or “much” for 32.4% thought the project contributed to building ties between the two, (total number of sample is 118). Traffic movement between the provinces under two governments became active by the project and cooperation between provinces has been enhanced.

There is no standard of evaluation of the project in conflict-affected countries/regions since causes of conflicts are different from country to country so as the environment surrounding of the project. It is also difficult to measure to what extent one project contributed to peacebuilding. However, the project produced impacts at the level of community on peace and stability through the improvement of security, and restoration of trust in the Philippines government. In addition, the timing was highly appropriate to commence the project from the viewpoints of peacebuilding.

Republic of the Philippines

Ex-Post Evaluation of Japanese ODA Loan

“Arterial Road Links Development Project (V)”

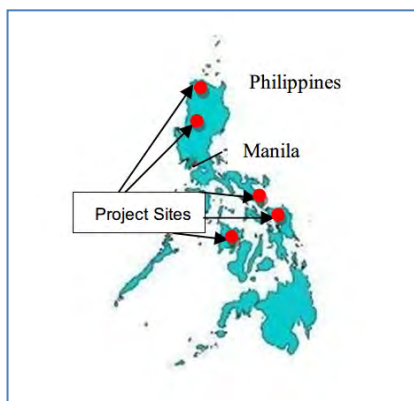
External Evaluator: Kenichi Inazawa, Octavia Japan Co., Ltd.

0. Summary

This project improved roads and bridges for the badly conditioned sections of the arterial roads of the Philippines, with the aim of responding to increasing traffic volumes and to reduce travel time. At the time of the appraisal and ex-post evaluation, the project is consistent with the development policy of the Philippines and with the development needs for paving arterial roads, as well as for expanding and improving road networks. It was also consistent with the assistance policy of Japan; thus, the relevance of the project is high. Through the project, the initial targets have been mostly achieved in terms of average daily traffic volume capacity increases and reduction in travel time. Additionally, a beneficiary survey confirmed that the project is supporting improvements in agricultural productivity in the target areas. It is also contributing to the improvement of living conditions of the residents near the project sites, as well as to the vitalization of the local economy; thus, the project’s effectiveness and impact are high. On the other hand, the project cost exceeded the plan and the project period was significantly longer than planned; thus, efficiency is low. There is a staff shortage at the District Engineering Office (hereinafter referred to as “DEO”) responsible for the operation and maintenance of the project. Furthermore, the DEO’s maintenance is not necessarily sufficient because the organization has not been able to replace old heavy machinery and vehicles for many years; thus, sustainability of the project is fair.

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

1. Project Description



Project Location



The Iloilo East Coast-Capiz Road (the Panay Island)

1.1 Background

Road transportation is the largest transportation means in the Philippines. Although significant investments had been made to improve the national arterial roads and secondary arterial roads¹ that form the backbone of the national road network, many sections remained unpaved and were not fully functional. In addition, roads were frequently damaged by natural disasters such as typhoons and there were not many alternative routes. This hindered the realization of an efficient transportation system. Thus, development of safe and efficient arterial road networks was considered as an urgent task. Japan has been assisting the development of north-south arterial roads via various projects such as “Philippines-Japan Friendship Highway Projects²” since the 1960s, given the geography of the Philippines as being long in a north-south direction. However, with a view to placing an importance on geographically-balanced development, Japan also indicated a policy of developing arterial roads connecting in an east-west direction and also connecting the islands’ surrounding roads in addition to the north-south system. From the 1990s onwards, Japan has assisted in the implementation of Phase I-IV projects with which arterial roads and bridges have been developed or rehabilitated on Leyte Island, Bohol Island, Cebu Island, Mindanao Island and Samar Island. Following these projects, the government of the Philippines requested a Japanese ODA loan from Japan for the implementation of the project as Phase V, which was intended to develop and rehabilitate the north-south arterial roads, east-west arterial roads and surrounding roads on the islands.

1.2 Project Outline

The objective of the project is to respond to the increasing traffic volume and to reduce travel time by developing and rehabilitating the badly conditioned sections of the Philippine arterial national roads ((1) Ligao-Pio Duran Road in the province of Albay; (2) Patapat Viaduct in the province of Ilocos Norte, (3) Suyo-Cervantes-Mankayan-Abatan Road and Cervantes-Sabangan Road in the Cordillera Administrative Region; (4) Catarman-Calbayog on the Island of Samar; and (5) Iloilo East Coast-Capiz Road on the Panay Island), thereby contributing to the economic and social development in and around the target areas.

¹ Arterial national roads refer to national roads that are the backbone of passenger and freight traffic, while secondary arterial roads refer to national roads connecting arterial national roads and each city/town/village.

² A series of road development projects covering a total of about 2,000km from the north-eastern part of Luzon to Mindanao Island in a north-south direction.

Loan Approved Amount/ Disbursed Amount	8,294 million yen / 7,772 million yen
Exchange of Notes Date/ Loan Agreement Signing Date	March 2001 / May 2001
Terms and Conditions	<p>【Main Construction】 Interest Rate: 2.2%, Repayment Period: 30 years (Grace Period: 10 years), Condition for Procurement: General Untied</p> <p>【Consulting Service】 Interest Rate: 0.75%, Repayment Period: 40 years (Grace Period: 10 years), Condition for Procurement: Bilateral Tide</p>
Borrower / Executing Agency(ies)	The Government of the Philippines / The Department of Public Works and Highways (DPWH)
Final Disbursement Date	September 2010
Main Contractor (Over 1 billion yen)	E.C. De Luna Construction Corp (the Philippines), China State Construction Engineering Corporation (China), Italian-Thai Development Public Company Limited (Thailand), China Harbour Engineering Company Limited (China)
Main Consultant (Over 100 million yen)	Katahira & Engineers International (Japan), Pacific Consultants International (Japan)
Feasibility Studies, etc.	<p>F/S</p> <p>All of the following were implemented by the Philippine side: Cordillera Road Network Development Project (December 1996), Ligao-Pio Duran Road (May 1997), Catarman-Calbayog Road (June 1999), Iloilo East Coast-Capiz Road (June 1999)</p>
Related Projects	<p>Arterial Road Links Development Project (I) (L/A was signed in December 1994)</p> <p>Arterial Road Links Development Project (II) (L/A was signed in August 1995)</p> <p>Arterial Road Links Development Project (III) (L/A was signed in September 1998)</p> <p>Arterial Road Links Development Project (IV) (L/A was signed in December 1999)</p>

	<p>Arterial Road Links Development Project (VI) (L/A was signed in March 2002)</p> <p>Cordillera Road Improvement Project (L/A was signed in December 1999)</p> <p>Road Upgrading and Preservation Project (L/A was signed in March 2011)</p>
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2. Outline of the Evaluation Study

2.1 External Evaluator

Kenichi Inazawa (Octavia Japan Co., Ltd.)

2.2 Duration of Evaluation Study

Duration of the Study: November 2013 – December 2014

Duration of the Field Study: February 15 – March 2, 2014, May 26 – June 1, 2014

2.3 Constraints during the Evaluation Study

Due to time and budget constraints, not all the project sites were visited during this evaluation study. The visited sites are two sections in the Cordillera Administrative Region (Suyo-Cervantes-Mankayan-Abatan Road and Cervantes-Sabangan Road) and East Iloilo-Capiz Road on the Panay Island. In addition, considering the impacts of Super Typhoon Haiyan (Yolanda) which occurred in November 2013, only two sections in the Cordillera Administrative Region were targeted for the beneficiary survey as these sections were not directly affected by the super typhoon.

3. Results of the Evaluation (Overall Rating: C³)

3.1 Relevance (Rating: ③⁴)

3.1.1 Relevance to the Development Plan of the Philippines

The Arroyo administration at the time of the project appraisal formulated the “Medium-Term Philippine Development Plan (2001-2004)”, in which “supporting Philippine’s socioeconomic development through the provision of safe and reliable transport service” was listed as one of the development goals concerning the transport sector. In addition, the country developed a

³ A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

⁴ ③: High, ② Fair, ① Low

strategic goal which aimed to “pave all arterial national roads⁵ and to increase paved road ratio of secondary arterial roads⁶ to 66% by 2004, by improving quality of the existing infrastructures through appropriate development and maintenance.” In order to achieve this goal, an emphasis was placed on the standard improvement (increased paved road ratio and widening of roads) of the arterial roads connecting regional cities—hubs for the local economies—with the surrounding areas.

On the other hand, at the time of ex-post evaluation, the government of the Philippines formulated the “Mid-Term Philippine Development Plan” (2011-2016). The plan highlighted the “strategic development of transport infrastructures as well as maintenance and management of transport infrastructures”, listing road network expansion as a priority. In addition, the Department of Public Works and Highways (hereinafter referred to as “DPWH”), the executing agency of the project, developed its “Mid-Term Development Plan” (2011-2016) which indicated that they would pursue safety and efficiency of the transport sector and would strive to improve access in terms of transportation of goods and services by expanding and improving arterial road networks.”

Thus, the transport sector was placed an importance at the time of the project appraisal and it remains important at the time of ex-post evaluation. Therefore, it can be confirmed that the project is relevant to the development policy.

3.1.2 Relevance to the Development Needs of the Philippines

Japan had been assisting the development of north-south arterial roads via various projects such as “Philippines-Japan Friendship Highway Projects” since the 1960s given the geography of the Philippines as being long in a north-south direction; however, with the view toward geographically balanced development, Japan indicated a policy of developing arterial roads connecting in an east-west direction and also connecting the islands’ surrounding roads in addition to the north-south system at the time of the project appraisal. From the 1990s onwards, Japan has assisted in the implementation of Phase I-IV projects with which arterial roads and bridges have been developed or rehabilitated on Leyte Island, Bohol Island, Cebu Island, Mindanao Island and Samar Island. The project was planned as Phase V with the intention of developing and rehabilitating the arterial roads, east-west arterial roads and the islands’ surrounding roads. The development needs concerning each project scope confirmed at the time

⁵ The paved road ratio was 71% prior to the project commencement (1998 data), and it was aimed to reach 100% by 2004.

⁶ Similarly, the paved road ratio was 47% prior to the project commencement (1998 data).

of the project appraisal are summarized in (1)-(5) below:

- (1) The Ligao-Pio Duran Road in the province of Albay (east-west arterial road): Ligao is located north west of the City of Legazpi (with the population of about 150,000), the central city of Bikol (Region V). Ligao's main industry is agriculture, while Pio Duran's main industry is fishery. However, the road connecting the two cities was mostly not paved or paved using a low-cost method. Therefore, pavement was needed to realize efficient transportation of agricultural and marine products in Bikol. (→A need to pave/widen the existing road.)
- (2) Patapat Viaduct in the province of Ilocos Norte (east-west arterial road): Patapat Viaduct was constructed under the ninth Japanese ODA loan, the "Philippines-Japan Friendship Highway Project (II)," as a part of the road connecting the two main cities of Northern Luzon, Laoag City and Tuguegarao City. It was inaugurated in October 1986. The traffic volume of this bridge was roughly 2,000 vehicles per day, which was relatively significant for a bridge on the regional arterial road. However, because of the typhoon of October 1991, the scouring of the bridge pier foundations made the structure unstable. Thus, it became necessary to rehabilitate the bridge. (→A need to rehabilitate the existing bridge.)
- (3) The Suyo-Cervantes-Mankayan-Abatan Road and the Cervantes-Sabangan Road in the Cordillera Administrative Region (east-west arterial road): Surrounded by high mountains, the Administrative Region's basic infrastructures such as roads and telecommunications were underdeveloped. Especially, road networks were not developed⁷ and arterial roads were often interrupted by natural disasters that created serious damages to the infrastructures. It was thus necessary to pave and rehabilitate/improve the existing roads. (→A need to pave and rehabilitate/improve the existing roads.)
- (4) The Catarman-Calbayog Road on the Island of Samar (east-west arterial road): The main industries of the Island of Samar are agriculture and fishery. Calbayog, the capital city of the province of Western Samar, and Catarman, the capital city of the province of Northern Samar, were the centers for the island's economic activities. However, the road connecting these cities was not paved. Thus it was considered important to develop this section. (→A need for pavement.)
- (5) The Iloilo East Coast-Capiz Road on the Panay Island (the Islands' surrounding roads): The main industries of the Panay Island were agriculture and fishery. Out of the roads connecting the City of Iloilo, the capital of the province of Iloilo, with the City of Roxas,

⁷ In the Administrative Region 80% of the roads were not paved.

the capital of the province of Capiz, the Balasan-Ajui section was paved in 1994 as the island's surrounding arterial road connecting the eastern part of the province of Iloilo with the province of Capiz. The traffic volume then increased dramatically. As the road conditions deteriorated with many damaged spots, it was urgently needed to rehabilitate the abovementioned section. (→A need to rehabilitate the existing road.)

On the other hand, the national paved road ratio is 88% (2012) at the time of ex-post evaluation. Along with the high economic growth (6.82%, 2012) in recent years, business opportunities for private companies have been expanding, while the number of households owning automobiles and motorbikes has increased. As a result, traffic volume of the arterial road has also increased. In response to such a situation, DPWH is indicating its policy of developing arterial roads with a view to increasing the national paved road ratio to 97% by 2016.

In light of the above, the Philippines continue to strive to develop arterial road networks at the time of ex-post evaluation. Thus it can be judged that the development needs are high at the time of the project appraisal and ex-post evaluation.

3.1.3 Relevance to Japan's ODA Policy

In December 1999 JICA prepared the "Medium-Term Policy for Overseas Economic Cooperation Operations" based the development issues of the Philippines and Japan's assistance policy for the Philippines. In this document the following fields were listed as priorities: (1) "making economies more resilient while overcoming constraints in order to achieve sustainable growth (e.g., appropriate macroeconomic management, reinforcing industrial structures, and developing economic infrastructures)"; (2) "poverty alleviation and correction of regional disparities"; (3) "environmental protection including disaster prevention as well as disaster prevention measures"; and (4) "human resource development and system building." Out of these the project corresponds to "(1)" which is about economic infrastructure development. Additionally, it is expected that utilization of improved road would lead to economic growth. Thus, the project is consistent with the assistance policy of Japan.

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

3.2 Effectiveness⁸ (Rating: ③)

3.2.1 Quantitative Effects (Operation and Effect Indicators)

1) Average Daily Traffic Volume

The project constructed bridges and rehabilitated/paved existing roads. Table 1 shows the baselines and targets concerning average daily traffic volume at the time of the project appraisal as well as the actuals at the time of ex-post evaluation (recent three years). It can be observed that the developed sections are mostly responding to the increasing traffic demands.

Table 1: Average Daily Traffic Volume of Each Targeted Section

(Unit: vehicle per day)

Targeted Section	At Project Appraisal		Actual		
	Baseline (2001)	Target (2007)	2011	2012	2013
(1) Ligao-Pio Duran Road in the province of Albay (completed in April 2011)	273	446	1,407	1,693	2,090
(2) Patapat Viaduct in the province of Ilocos Norte (completed in August 2009)	2,069	2,818	952	4,922	6,503
(3) Cordillera Administrative Region (completed in April 2011)					
a) Suyo-Cervantes-Mankayan-Abatan Road	195	467	N/A	N/A	Approx. 600
b) Cervantes-Sabangan Road (*Note)	209	675	303	388	419
(4) Catarman-Calbayog Road on the Island of Samar (completed in August 2007)	89	435	N/A	N/A	3,050
(5) Iloilo East Coast-Capiz Road on the Panay Island (completed in April 2007)	1,184	1,547	2,019	1,888	N/A

Source: JICA's internal document (at the time of the project appraisal), answers to the questionnaire and results of the interviews with DEOs (at the time of ex-post evaluation)

Note: DPWH is continuing the pavement construction at the time of ex-post evaluation.

Concerning (3-b) Cervantes-Sabangan Road (most of which is mountain road), pavement construction was put off for some sections in 2007 because DPWH faced budget shortage, as it will be explained below in the "Project Outputs" under Efficiency. DPWH resumed the paving work in 2013 using its own fund⁹.

⁸ Sub-rating for Effectiveness is to be put with consideration of Impact.

⁹ According to DPWH Headquarters, all the sections will be completed (paved) by the end of 2014. They expect that traffic volume will increase after the completion. At the time of ex-post evaluation, some vehicles are taking other regional roads to reach their destinations. Additionally, traffic volume is not significant yet partly because the

With regard to the other road sections, the initial targets were exceeded for (1) Ligao-Pio Duran Road and (5) Iloilo East Coast-Capiz Road at the time of the completion of each section (2011). Concerning (2) Patapat Viaduct, while the target was not achieved in 2011, targets have been achieved since 2012¹⁰. As for (3-a) Suyo-Cervantes-Mankayan-Abatan Road in the Cordillera Administrative Region and (4) Catarman-Calbayog Road on the Island of Samar, 2011 and 2012 data could not be obtained. However, the initial target was achieved in 2013¹¹.

2) Reduction in Travel Time

As a result of the pavement and rehabilitation of the existing roads through the project, travel time has generally reduced for vehicles. Table 2 shows the baselines and targets after completion set at the time of the project appraisal. It also shows the actual travel time from 2011 to 2013.

Table 2: Reduction in Travel Time by Section¹²

(Unit: time)

Section	At Project Appraisal		Actual		
	Baseline (2011)	Target (2007)	2011	2012	2013
(1) Ligao-Pio Duran Road in the province of Albay	0.72	0.31	0.3	0.3	0.3
(3) Cordillera Administrative Region					
a)Suyo-Cervantes-Mankayan-Abatan Road	6~7	2	1.8 ~2.0	1.8 ~2.0	1.8 ~2.0
b)Cervantes-Sabangan Road *Note	2.27	0.71	0.8 ~1.0	0.8 ~1.0	0.8 ~1.0
(4) Catarman-Calbayog Road on the Island of Samar	2.25	0.65	N/A	N/A	0.7~ 0.8
(5) Iloilo East Coast-Capiz Road on the Panay Island	1.0	0.56	0.5	0.5	0.5

Source: JICA's internal document (at the time of the appraisal), answers to the questionnaire, results of the interviews with DEOs and the actual traffic situations observed during the site visit (for the both sections of (3) Cordillera Administrative Region) (at the time of ex-post evaluation)

Note: DPWH is continuing the paving work at the time of ex-post evaluation.

completion of a long bridge located inside the targeted section on Cervantes side (Aluling Bridge, not part of this project) was postponed until April 2013.

¹⁰ According to DEO responsible for the maintenance of this bridge, the actual travel time was less than the target in 2011 because "the completion of the bridge was not widely known at the time in 2011 and it was not fully responding to the traffic demand. Vehicles tended to take a detour. Later on, when the completion and convenience of the bridge came to be known, transportation of goods and agricultural products using trucks began to increase." (As Table 1 shows, traffic volume has been increasing since 2012.)

¹¹ As it will be explained in "Project Outputs" under Efficiency, the conditions of the Catarman-Calbayog Road were re-examined at the time of the detailed design. As a result, it turned out that some sections were in good conditions (about 20km). It was thus judged that traffic in these sections would be smooth without pavement, and the pavement work was put off. In other words, the construction was carried out based on the judgment that future traffic volumes could be managed without paving work in some sections.

¹² As the extended part was as short as about 1.1km for Patapat Viaduct in the province of Ilocos Norte, no target was set for this indicator.

Comparing the actuals after completion with the initial targets, the targets were mostly achieved for the following three sections: (1) Ligao-Pio Duran Road; (3-a) Suyo-Cervantes-Mankayan-Abatan Road; and (5) Iloilo East Coast-Capiz Road. However, targets were not achieved in the (3-b) Cervantes-Sabangan Road and (4) Catarman-Calbayog Road, although they came close. The former was not achieved; it takes time for vehicles to pass the road because the paving work was partially cancelled due to budget shortage and the road condition remains not so well at the time of ex-post evaluation. With regard to the Catarman-Calbayog Road, on the other hand, it takes time for vehicles to pass because there are some unpaved parts (about 20km)¹³.



Figure 1: (1) Ligao-Pio Duran Road in the province of Albay

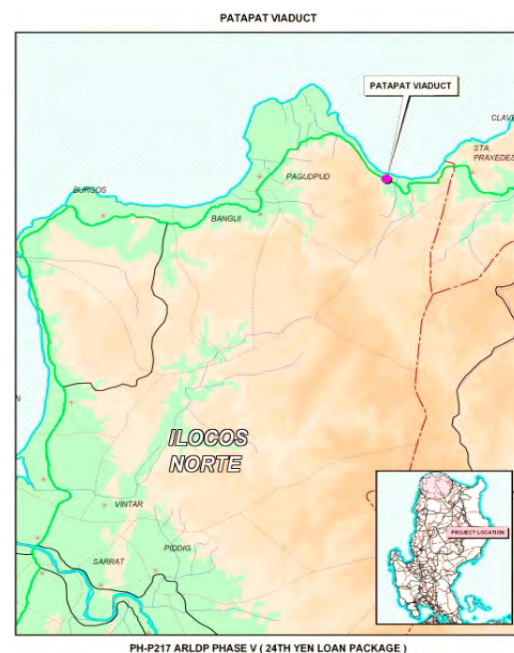


Figure 2: (2) Patapat Viaduct in the province of Ilocos Norte

¹³ While traffic volume greatly exceeded the target, travel time has not reduced in this section because the detour (an existing arterial road) is located rather far (refer to Figure 4: the northwest area of the Island of Samar). This is why drivers opt for taking the main road even though it takes time to drive the unpaved section.

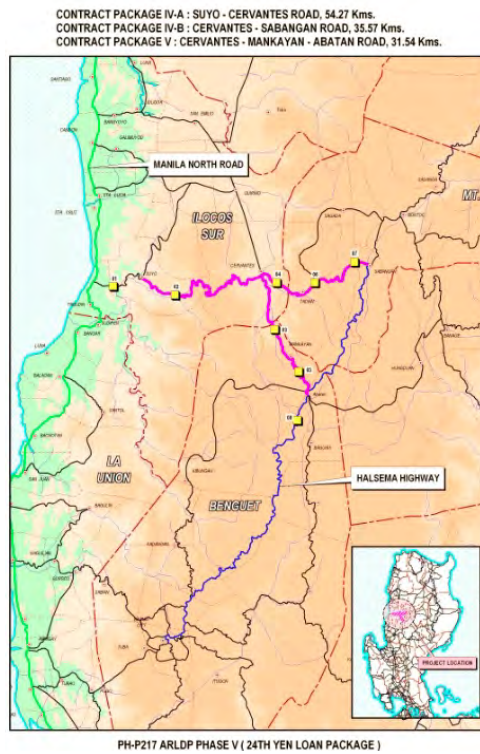


Figure 3: (3) Suyo-Cervantes-Mankayan-Abatan Road and Cervantes-Sabangan Road in Cordillera Administrative Region



Figure 4: (4) Catarman-Calbayog Road on the Island of Samar



Figure 5: (5) Iloilo East Coast-Capiz Road on the Panay Island



Photo 1: (3-a)
Suyo-Cervantes-Mankayan-Abatan Road



Photo 2: (3-b) Unpaved section of
Cervantes-Sabangan Road

3.2.2 Qualitative Effects (Improvement in Convenience and Safety)

A beneficiary survey was conducted to capture changes attributed to the project in terms of convenience and safety of travel. The survey targeted drivers and residents along the following roads visited during the field study: (3-a) Suyo-Cervantes-Mankayan-Abatan Road in the Cordillera Administrative Region and (3-b) Cervantes-Sabangan Road. Samples were drawn based on the random sampling method and it used a questionnaire. The results of the beneficiary survey are summarized below:

As it can be seen from Figure 6 and Figure 7, quite a high percentage of drivers and residents living near the project sites think that traffic volume has increased while travel time has reduced. In addition, it can be observed from Figure 8 that many of the respondents think that convenience “improved” or “greatly improved.” With regard to safety shown in Figure 9, a large proportion of the respondents think that it has “not improved.” This is partly because most of the sections in (3) Cordillera Administrative Region are mountain roads. As it will be explained below in “3.3.2.1 Impacts on the Natural Environment,” soil along the cliffs tends to become fragile during heavy rain and typhoons, and there are risks of sediment flow and falling rocks after the completion of the targeted section. Therefore, it can be judged that there are some concerns about the safety of passing vehicles and road conditions with regard to the roads and bridge developed in the Cordillera Administrative Region.

According to the interview with DEO (DPWH Third DEO) responsible for the maintenance of other targeted sections (Iloilo East Coast-Capiz Road on the Panay Island), they commented on the safety of passing vehicles and road condition: “With the project the road has been widened and it has become possible for vehicles to pass smoothly. Driving on the paved road is

comfortable and safe. The maintenance work is also being carried out without problems.” Thus it can be judged that the safety situations differ from one section to another.

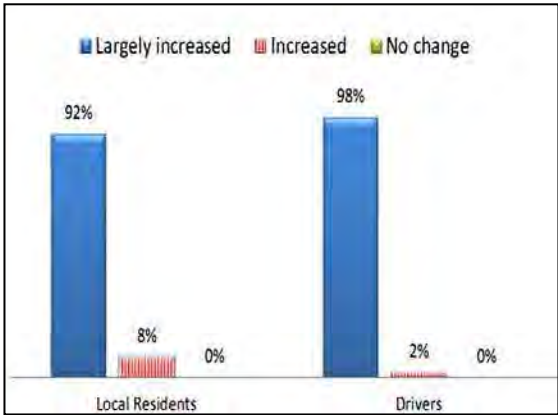


Figure 6: Do you think that traffic volume increased after the completion of the targeted section? (n=64 residents and 50 drivers)

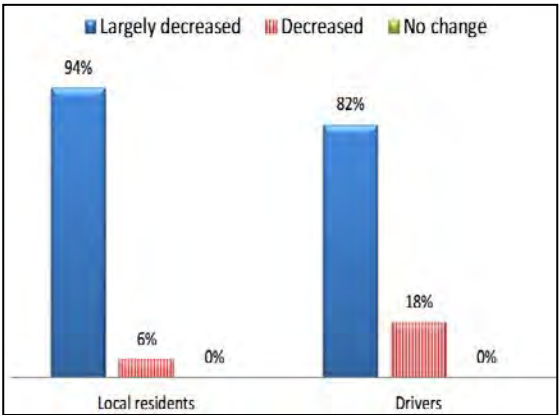


Figure 7: Do you think that travel time reduced after the completion of the targeted section? (n= 64 residents and 50 drivers)

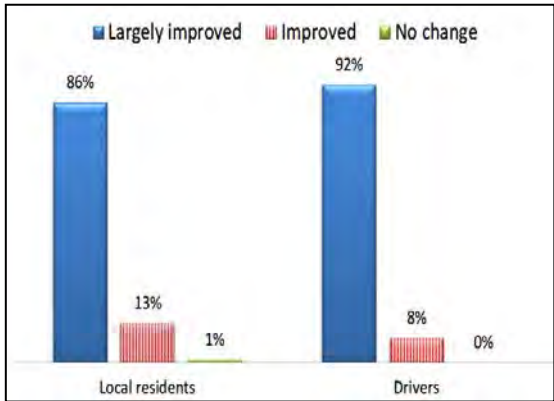


Figure 8: Do you think that comfort in terms of driving on the road/bridge improved after the completion of the targeted section? (n=64 residents and 50 drivers)

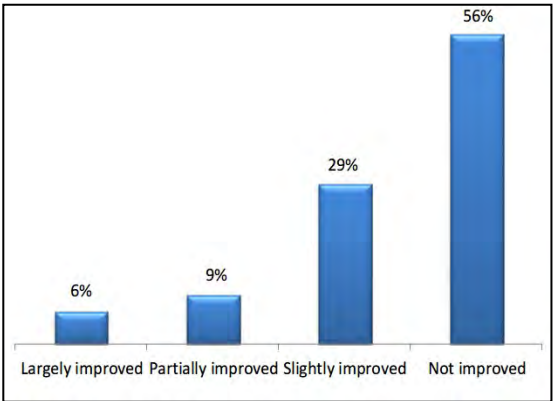


Figure 9: Do you think that safety of the road/bridge improved after the completion of the targeted section? (n=64 residents)

3.3 Impact

3.3.1 Intended Impacts

3.3.1.1 Contribution to Local Economy and Social Development

Table 3 shows the data on productions of agriculture produces in each targeted area at the time of ex-post evaluation (recent 4 years). It can be observed that the productions are generally

on the increase in all the targeted areas. Through the pavement and improvement of arterial roads with the project, it became easier to transport production inputs such as seeds, seedlings and fertilizer. Also, it reduced the cost of transporting agricultural products. As a result, it can be presumed that the project is contributing to improvements in agriculture productivity in each targeted area.

Table 3: Changes in Production of Main Agriculture Products in Project Areas

(Unit: ton)

Area	Agricultural Product	2009	2010	2011	2012
1) The province of Albay ((1) Ligao-Pio Duran Road)	Coconut	155,663	161,104	160,986	171,040
2) The province of Ilocos ((2) Patapat Viaduct, (3) Suyo-Cervantes-Mankayan Road)	Tobacco	24,341	27,325	30,171	32,538
3) Cordillera Administrative Region ((3-a) Cervantes-Sabangan, ((3-b) Cervantes-Mankayan-Abatan Road)	Cabbage	99,155	102,344	98,943	99,362
	Rice	431,656	400,415	428,949	453,461
	Corn	201,773	172,195	218,788	225,135
4) The province of North Samar ((4) the Catarman-Calbayog Road)	Coconut	317,855	327,895	337,690	345,209
5) Western Visayas including Panay ((5) Iloilo East Coast-Capiz Road)	Sugar cane	791,321	642,212	1,258,358	1,149,658

Source: The Bureau of Agriculture Statistics (BAS)

In addition, as shown in Figure 10-12, according to the beneficiary survey targeting farmers and drivers in the Cordillera Administrative Region, many respondents think that their marketing opportunities for agriculture products expanded, that their incomes increased and that transportation of goods improved. These results are thought to confirm the data indicating production increases shown in Table 3. According to some respondents who were interviewed, they think that “transporting goods became easier than before. With improved transportation access to other cities and villages, there are more opportunities to market agricultural products. Improved transportation access also generated competition (among companies) for daily commodities and agricultural products; thus people became able to purchase goods more reasonably than before.” Thus it can be presumed that the development of the roads and bridges through the project has positively impacted agriculture productivity in the targeted areas. In addition, a high percentage of the respondents think that the local economy has “improved” or

“largely improved” as shown in Figure 13; thus it is thought that the project has direct and indirect economic impacts. Furthermore, as shown in Figure 14 and Figure 15, many respondents think that traffic accessibility to commercial and public facilities improved thanks to the project, and it has led to improved relationship with their neighbors. Therefore, it can be thought that the project is contributing to the improvement of social and living conditions of the residents.

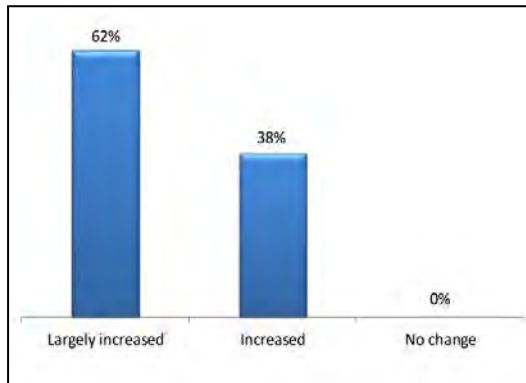


Figure 10: Do you think that marketing opportunities expanded for agricultural products after the completion of the targeted section? (n=39 farmers)

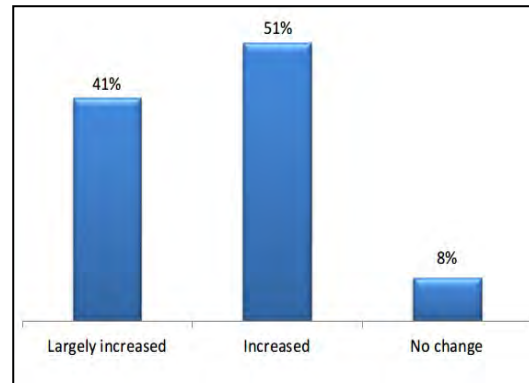


Figure 11: Do you think your agricultural income increased after the completion of the targeted section? (n=39 farmers)

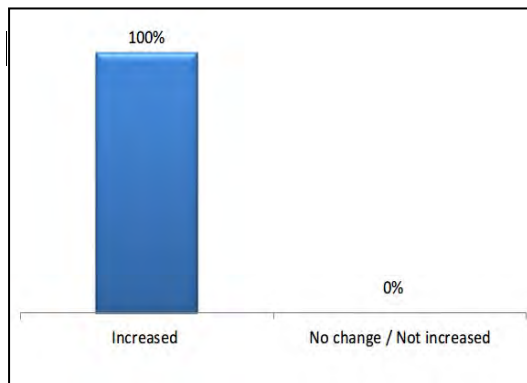


Figure 12: Do you think transportation of goods such as agricultural products increased after the completion of the targeted section? (n=50 drivers)

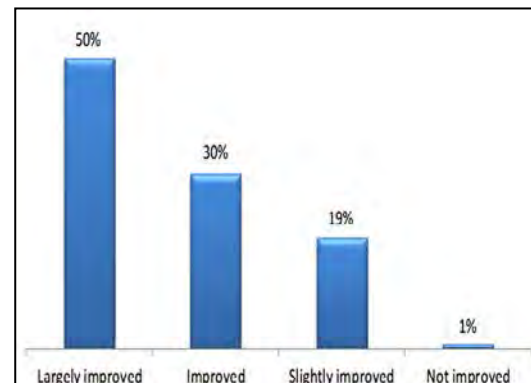


Figure 13: Do you think the local economy improved after the completion of the targeted section? (n=64 residents)

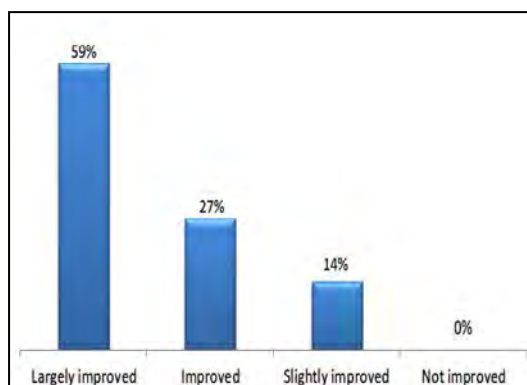


Figure 14: Do you think access to public facilities (church, school, markets, etc.) improved after the completion of the targeted section? (n= 64 residents)

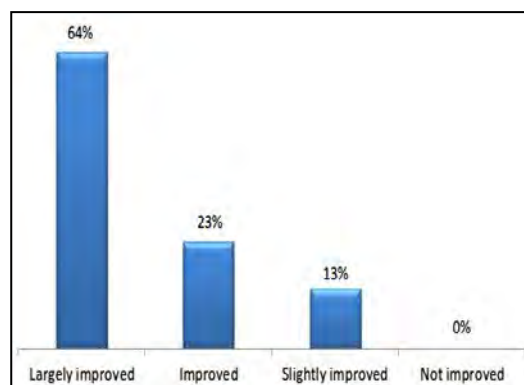


Figure 15: Do you think the relationship with other towns improved after the completion of the targeted section? (n=64 residents)

3.3.2 Other Impacts

3.3.2.1 Impacts on the Natural Environment

At the time of the project appraisal, no negative environmental impacts were foreseen. It was confirmed through the questionnaire and interviews during the field study of this evaluation that there were no negative impacts on natural environment, including air pollution, noise and vibration during the project implementation. During the project implementation DPWH carried out an environmental monitoring together with the Department of Environmental and Natural Resources (DENR), local government offices and NGOs. In the case of the Cordillera Administrative Region visited during the field study, a team was formed every three months to monitor and check the environmental issues such as air pollution, noise and vibration. According to the interviews with DEO in the Region, there were no negative environmental problems or complaints from local residents during the project implementation.

3.3.2.2 Land Acquisition and Resettlement

There was no resettlement associated with the project.

On the other hand, it was foreseen that compensation would be needed for the acquisition of land required for the widening of roads as well as removal of trees and fences along housing boundaries in the flowing sections: (1) Ligao-Pio Duran in the province of Albay (estimated land to be acquired was 109,000m²); (3-a) Suyo-Cervantes-Mankayan-Abatan in the Cordillera Administrative Region (estimated land to be acquired was 665,200m²); and (3-b)

Cervantes-Sabangan in the same region (estimated land to be acquired was 222,200 m²). With regard to (1) and (3-b), concerned parties had no objections and DPWH paid the compensation while covering the removal costs. Regarding (3-a), however, the payment of compensation required for the land acquisition and tree removals (mainly in Mankayan) is delayed at the time of ex-post evaluation. According to the initial Resettlement Action Plan for Land Acquisition obtained during ex-post evaluation, it was foreseen that a total of 273 landowners, 354 plots and 288,637m² would be subject to compensation in the amount of 49,336,041 peso¹⁴. At the time of ex-post evaluation, accurate data concerning the number of persons subject to land acquisition is not calculated. Finally, however, it was mentioned that less than 100 persons (anticipated compensation amount is unknown) would be subject to land acquisition and roughly 30-40 persons would be subject to tree removals (estimated compensation of about 3.8 million peso or 8.7 million yen).

As indigenous people reside in (3-a), the following 1)-4) actions have been taken until the time of ex-post evaluation:

- 1) The Land Acquisition Plan was developed at the time of the detailed design of the project (February 2002-April 2004). A guideline on acquisition procedures was developed and the estimated compensation amount required for land acquisition was calculated. However, compensation was not promptly paid mainly because DPWH Regional Office of the Cordillera Administrative Region could not manage their internal activities effectively.
- 2) In July 2002 a governmental organization, the National Commission on Indigenous Peoples (NCIP), began the issuance of Certificates of Ancestral Domain Title (hereinafter referred to as “CADT”) for indigenous peoples across the country. CADT recognizes land ownership of indigenous peoples and in principle forbids the selling or foregoing of lands owned by indigenous peoples for generations. At this stage, however, CADT was not in effect in Mankayan.
- 3) In December 2008 NCIP issued CADT for the indigenous people concerning lands in Mankayan (13,290ha). On the other hand, the construction work of this section began in February 2008 and was completed in October 2010; however, compensation was not paid either before commencement or after the completion of the construction. (It is because processes were delayed by changes of the management at the regional office which led to mismanagement of related documents¹⁵.)
- 4) Following the issuance of CADT, DPWH’s regional office in the Cordillera Administrative

¹⁴ According to DPWH, these initial estimates were calculated based on the F/S.

¹⁵ The management was reshuffled at least four times between the project commencement and ex-post evaluation. Every time it happened, procedures were revisited, creating delays in the processes. It was also said that rationalization, a restructuring/staff optimization policy which began after the commencement of this project, affected the process.

Region, together with DPWH Headquarters and DEOs in the region, began organizing and verifying land acquisition issues concerning this section in November 2013. At the time of ex-post evaluation they are still cautiously considering how to respond to the issues related to legal system development and compensation.

In light of the above, it can be judged that DPWH should have taken the initiative in processing the payment of compensation promptly and responsibly, either immediately after the detailed design or when CADT clearly became effective. At the time of ex-post evaluation DPWH commented, “We will see to it that the compensation is duly paid. However, we will first need to carefully examine the legal framework and verify the steps taken thus far.”

3.3.2.3 Unintended Positive/Negative Impact (Impacts of the project on Tourism)

Regarding the development of roads and bridges in (3-a) and (3-b) in the Cordillera Administrative Region as well as (2) Patapat Viaduct in the province of Ilocos Norte, some impacts are also observed in the area of tourism. The Cordillera Administrative Region visited during the field study has many touristic resources: a UNESCO’s world heritage site (rice terraces) and a number of towns/villages suited for summer resorts. According to the interviews with the residents in the region and DEO responsible for the maintenance of roads and bridges, they commented, “The developed roads have made the traffic smooth. It has increased traffic volume and the number of tourists. There are also more accommodations and shops. The situation is favorable for the local economy.” Based on such a comment, it can be presumed that the implementation of the project has improved tourists’ access to the region, thereby contributing to the increase in tourism incomes and to the vitalization of the local economy.



Photo 3: Bridge Developed by The project



Photo 4: Rice Terrace near Mankayan

(Conclusion on Efficiency and Impact)

With regard to average daily traffic volume, initial targets have been achieved in the (1) Ligao-Pio Duran Road and (5) Iloilo East Coast-Capiz Road. In addition, according to the 2013 data which was just released, targets have been achieved for some sections: (2) Patapat Viaduct, (3-a) Suyo-Cervantes-Mankayan-Abatan Road and (4) the Catarman-Calbayog Road. On the other hand, the initial target has not been achieved in the (3-b) Cervantes-Sabangan Road at the time of ex-post evaluation because DPWH is still carrying out the paving work using its own fund. Nevertheless, its average daily traffic volume has been steadily increasing for the past three years and targets are expected to be achieved after the completion, according to the executing agency.

In terms of reduction in travel time, the initial targets have been achieved in all the sections except for the Catarman-Calbayog Road and Cervantes-Sabangan Road mentioned above. The Catarman-Calbayog Road is being paved because traffic volume increased in recent years and congestion is a serious problem. The agricultural production data and beneficiary survey have confirmed that the project is supporting the improvements in agricultural productivity, contributing to the improvement in living conditions of the residents near the project sites. It is also greatly contributing to the vitalization of the local economy. Considering these facts comprehensively, it can be judged that effectiveness and impact of the project is high. Needles to say, however, the delay observed in the payment of compensation should be addressed as soon as possible in relation to the acquisition of land required for the Cervantes-Mankayan-Abatan section.

3.4 Efficiency (Rating: ①)

3.4.1 Project Outputs

Table 4 shows the planned and actual outputs of the project.

Table 4: Planned and Actual Outputs of The project

Plan (At the time of Appraisal)	Actual (At the Time of Ex-Post Evaluation)
1) Civil Engineering Work (1) Ligao-Pio Duran Road in the province of Albay : Development of roads (about 21.8km) and bridges (3 places) (2) Patapat Viaduct in the province of Ilocos Norte : Protection work for the pier foundation (approx. 1.1km)	1) Civil Engineering Work (1) Ligao-Pio Duran Road in the province of Albay : Development of road (23.6km) and bridges (3 places) (2) Patapat Viaduct in the province of Ilocos Norte : Protection work for the pier foundation (1.1km)

(3-a) Suyo-Cervantes-Mankayan-Abatan Road in the Cordillera Administrative Region and (3-b) Cervantes-Sabangan Road : Development of roads (a total of approx. 111.4km) and bridges (10 places) (4) Catarman-Calbayog Road on the island of Samar : Development of roads (approx. 68.3km) and bridge (1 place) (5) Iloilo East Coast-Capiz Road on the Panay Island : rehabilitation of damaged roads (approx. 39.5km)	(3-a) Suyo-Cervantes-Mankayan-Abatan Road in the Cordillera Administrative Region and (3-b) Cervantes-Sabangan Road : Development of roads (a total of approx. 108km, but partially under construction) and bridges (10 places) (4) Catarman-Calbayog Road on the island of Samar : Development of roads (47.33km) and bridge (1 place) (5) Iloilo East Coast-Capiz Road on the Panay Island : rehabilitation of damaged roads (39.0km)
2) Consulting Services The main TORs are to conduct detailed design (or to review the detailed design), assisting bidding, construction supervision, assisting land acquisition and resettlement, environmental monitoring on the compliance to the environmental compatibility conditions, advising on social and environmental measures implemented by the executing agency and contractors, etc. (Planned MM: a total of 604MM for the detailed design, 1,000MM for construction supervision, and 57MM for the other tasks)	2) Consulting Services The TORs listed on the left-hand column were executed as planned. (Actual MM: 947.17MM for detailed design, 2,126.41MM for construction supervision, and 185.2MM for others)

Source: JICA's internal document (plan), project completion reports and answers to the questionnaire (actual)

Below are the explanations for the disparities between the planned and actual outputs shown in Table 4:

1) Civil Engineering Work

(1), (2) and (5) were mostly as planned. On the other hand, (3) was slightly less than planned, while the road extension of (4) was shorter by approximately 20km than planned. It is mainly because material costs such as that of cement increased during the project implementation. As the construction cost was expected to increase, DPWH faced the need to complete construction with the initially planned project budget. As a result, the project scope was downscaled. Additionally, the (3-b) Cervantes-Sabangan Road in the Cordillera Administrative Region is especially steep and mountainous and landslides were caused by heavy rains; thus the construction was more difficult than expected. As it was expected that the cost would increase, DPWH put off the pavement of some sections during the project implementation in 2007. As a result, the actual extended kilometer was different from the plan¹⁶. Concerning the extension of

¹⁶ However, as of March 2014 DPWH is paving the section that was once put off using its own fund. It is expected

the (4) Catarman-Calbayog Road, some sections (approx. 20km) were found to be in a good condition when the construction plan was reviewed during the detailed design, which was immediately after the project commencement. This created the disparity¹⁷.

2) Consulting Services

The actual MM was more than planned because the project period was extended as it will be explained below in “3.4.2.2 Project Period.”

3.4.2 Project Inputs

3.4.2.1 Project Cost

The total project cost was initially planned to be 11,059 million yen (out of which 8,294 million yen was to be covered by Japanese ODA loan). In reality, the total project cost was 10,950 million yen (out of which 7,773 million was covered by Japanese ODA loan), which is 99% of the plan. However, adding the actual cost (258.8 million peso or 595 million yen) which would have occurred, such as the cost of paving one section of the (3-b) Cervantes-Sabangan Road where the paving work was once put off due to budget shortage (approx. 109 million peso or 250 million yen), the cost of completing the construction for one section in which paving work was cancelled because the road condition was good at the time of the detailed design (approx. 146 million peso or 336 million yen to complete the pavement of (4) Catarman-Calbayog Road) and the unpaid compensation concerning the (3-a) Cervantes-Mankayan-Abatan Road (approx. 3.8 million peso or 8.7 million yen for the removal of trees and fences along the housing boundary although the amount only represents what is known), the total project cost is calculated to be 11,545 million yen. This exceeds the initial plan or 104% of the plan. Therefore, efficiency is judged to be low considering the actual outputs versus the actual project cost.

3.4.2.2 Project Period

The project was planned to be implemented for 5 years and 9 months (69 months) from May 2001 to January 2007 as shown in Table 5. In reality, however, the project required 12 years and 11 months (155 months) from May 2001 to March 2014, which is significantly longer than planned (224% of the plan). The reasons are as follows: 1) the central government was late in

that the pavement of the entire section will be completed by the end of 2014.

¹⁷ Although it was put off, traffic volume of this section has increased in recent years, creating severe traffic congestion. In response to such a situation, DWPH is carrying out the paving work for the remaining sections using its own fund as well as Japanese ODA loan (“Road Upgrading and Preservation Project”, for which L/A was signed in March 2011).

allocating local-portion budgets to DPWH¹⁸; 2) construction was frequently interrupted by unexpected weathers such as heavy rain and floods; 3) the road construction in the Cordillera Administrative Region was delayed because the project needed to increase the number of slope protection sites for safety reasons given the mountainous and steep road; 4) the issue of land acquisition concerning the (3-a) Cervantes-Mankayan-Abatan Road remains unsolved at the time of ex-post evaluation; and 5) the project is considered to be completed at the time of the first field mission (March 2014) because the paving work is on-going in the (3-b) Cervantes-Sabangan Road. Therefore, efficiency is judged to be low considering the actual project period versus the actual outputs.

Table 5: Planned and Actual Project Period

Item	Plan	Actual
1) Employment of Consultants	July 2000-June 2001	July 2000-June 2001
2) Detailed Design	July 2001-December 2002	February 2002-April 2004
3) Selection of Contractors	May 2002-January 2004	February 2003-April 2004
4) Civil Engineering Work	August 2003-January 2007	May 2003-present ¹⁹
5) Land Acquisition	January-December 2003	September 2005-present
6) Consulting Services	June 2001-July 2005	February 2002-December 2010

Source: JICA's internal document (plan), project completion reports and answers to the questionnaire (actual)

3.4.3 Results of Calculations of Internal Rates of Return (Reference only): Economic Internal Rates of Return (EIRR)

At the time of the appraisal, EIRR was calculated by considering the reduction in travel time and saving on maintenance cost as benefits, the construction cost and maintenance cost as costs, and with the project life of 20 years. The calculated rates were as follows: (1) 19.1% for Ligao-Pio Duran Road in the province of Albay; (2) 16.5% for Patapat Viaduct in the province of Ilocos Norte; (3) 16.5% for Suyo-Cervantes-Mankayan-Abatan Road and 72.1% for

¹⁸ It required significant time to obtain the budget approval for the project from the central government of the Philippines (the National Economic and Development Authority, "NEDA"). Especially, all budget approvals were significantly delayed including that for ODA loan projects due to the tight fiscal policy of the Philippine government from FY2004 to FY2005.

¹⁹ Construction schedules for different sections are follows: (1) Ligao-Pio Duran Road in the province of Albay: October 2009-April 2011; (2) Patapat Viaduct in the province of Ilocos Norte: March 2008-August 2009; (3) Suyo-Cervantes-Mankayan-Abatan Road and Cervantes-Sabangan Road in the Cordillera Administrative Region: June 2006-April 2011 (however, some parts are still under construction); (4) Catarman-Calbayog on the Island of Samar: May 2003-August 2007; and (5) Iloilo East Coast-Capiz Road on the Panay Island: June 2003-April 2007.

Cervantes-Sabangan Road in the Cordillera Administrative Region; (4) 15.4% for Catarman-Calbayog on the Island of Samar; and (5) 26.3% for Iloilo East Coast-Capiz Road on the Panay Island.

On the other hand, it was difficult to recalculate the EIRR at the time of ex-post evaluation because DPWH did not have basic vehicle operating cost (BVOC) after the project completion which is essential for the calculation.

The project cost exceeded the plan, while the project period significantly exceeded the plan. Therefore efficiency of the project is low.

3.5 Sustainability (Rating: ②)

3.5.1 Institutional Aspects of Operation and Maintenance

Each DEO of DPWH is responsible for the operation and maintenance of the roads and bridges developed through the project. The (1) Ligao-Pio Duran Road in the province of Albay is managed by Albay Third DEO, the (2) Catarman-Calbayog on the Island of Samar is by North Samar First DEO, the (3) Iloilo East Coast-Capiz Road on the Island of Pana is by DPWH Third DEO, the (4) Suyo-Cervantes-Mankayan-Abatan Road and Cervantes-Sabangan Road in the Cordillera Administrative Region is by Ilocos Sur Second DEO, Mountain Province DEO and Benguet Second DEO and the (5) Patapat Viaduct in the province of Ilocos Norte is by Ilocos Norte First DEO. Operation and maintenance works carried out by each DEO include cleaning and repair of pavement and bridges, repair of bumps on the roads, weeding and development of shoulders on the sidelines of the roads in order to prevent skidding accidents. DEOs also operate and store maintenance equipment (e.g., heavy machinery such as loaders and vehicles such as trucks for transportation of materials). In addition, each DEO is supervised and monitored by the respective regional office. DEOs submit reports every quarter, while regional offices visit and give guidance to the respective DEOs.

The number of DEO staff responsible for the operation and maintenance of the project is shown in Table 6. According to the interviews with the DEOs in the Cordillera Administrative Region visited during the field study, they commented that there was a constant shortage of site workers while the number of engineers and field superintendents was mostly sufficient. The DPWH's standard for staff allocation says: "It is appropriate to allocate one site worker per 3.5km of road extension." However, quite a number of DEOs across the country are not meeting

this standard due to budget shortage²⁰ and are maintaining roads and bridges with the limited number of staff. Therefore, it is thought necessary to allocate sufficient number of site workers by increasing maintenance budgets.

Table 6: Number of Staff Responsible for the Operation and Maintenance of the project
by DEO

DEO (corresponding section)	Engineers	Field Superintendent	Site Workers	Others	Total
1) Albay Third DEO : (1) Ligao-Pio Duran Road	1	1	20	-	22
2) North Samar First DEO : (4) Catarman-Calbayog Road	2	4	9	1	16
3) DPWH Third DEO : (5) Iloilo East Coast-Capiz Road	2	2	4	3	11
4) Ilocos Sur Second DEO : (3-a) Suyo-Cervantes-Mankayan Road	2	1	15	-	18
5) Mountain Province DEO : (3-b) Cervantes-Sabangan Road	2	2	6	-	10
6) Benguet Second DEO : (3-a) Mankayan-Abatan Road	1	1	11	-	13
7) Ilocos Norte First DEO : (2) Patapat Viaduct	1	3	10	-	14

Source: Answers to the questionnaire

3.5.2 Technical Aspects of Operation and Maintenance

The DEOs responsible for the roads and bridges developed by the project have well-experienced staff members in place. It has been confirmed through interviews conducted during the field study that DEO staff members were fully aware of the importance of operation and maintenance works and knew how to operate and maintain the heavy machinery and vehicles used for maintenance. On the job training (OJT) is provided at each DEO. For newly recruited staff, OJT is usually provided and maintenance techniques and skills are shared among the staff. With regard to training, DPWH Headquarters held training in the use of heavy machinery in November 2013²¹. Therefore, it can be observed that there are no major problems

²⁰ DPWH Headquarters is also aware that there is a shortage of staff at DEOs across the country.

²¹ DPWH is planning to hold training in improvement of safety and maintenance service titled "DEO Maintenance Workshop" for DEO staff across the country after March 2014.

with the technical aspects of the operation and maintenance by each DEO.

3.5.3 Financial Aspects of Operation and Maintenance

Table 7 shows data on operation and maintenance budgets of DEO responsible for the roads and bridged targeted by the project. The budget trends in the past three years²² vary from one DEO to another. According to DPWH Headquarters and DEOs, DEO tends to receive increased budgets the following year²³ if the road sections and bridges under the DEO required large volume of maintenance work in the previous year. On the contrary, DEO would be allocated smaller budgets compared to the previous year if the roads and bridges managed by the DEO were relatively in good conditions²⁴. On the other hand, according to the interviews with DEOs in the Cordillera Administrative Region visited during the field study, they commented, “It is not easy to renew the heavy machinery and vehicles that we own because we are only allocated limited operation and maintenance budget. Although they are still functional, their years of depreciation have passed and they need to be replaced. In addition, with the limited budget we cannot increase the number of site workers; thus we are requesting the headquarters to increase our budgets.” Furthermore, it was observed through the field visits that the heavy machinery and vehicles had not been renewed for many years due to budget shortage. Therefore, it can be judged that there are some concerns with the operation and maintenance budgets (financial aspects) of the project²⁵.

²² In principle, operation and maintenance budget for arterial roads are calculated by multiplying a flat EMK basic cost (peso) to an equivalent maintenance kilometer (“EMK”) determined by the types of road pavement, status, road width and traffic volume.

²³ For example, the road managed by 5) Mountain Province DEO has had many cases of falling rocks. As they needed to remove rocks and carry out slope protection works in 2011-12, the allocated budget increased.

²⁴ For example, roads managed by DPWH Third DEO (the Panay Island) are mostly flat and hence little maintenance work is needed as compared to Mountain Province; thus their budget has been decreasing.

²⁵ On the other hand, DPWH has been pursuing the Equipment Procurement Program (EPP) since 2012 (to 2016). This program aims to renew heavy machinery and vehicles owned by DEO. The headquarters procures centrally and provides machinery and vehicles to DEOs. The following budgets have been allocated under this program: 463 million peso for 2014, 554 million peso for 2015 and 664 million peso for 2016. According to the headquarters, the DEOs responsible for the operation and maintenance of this project are not targeted by this program at the time of ex-post evaluation. However, there is a possibility that these DEOs will be covered by the program in the future based on the priorities.

Table 7: Operation and Maintenance Budget for Roads and Bridges in Project Areas
(Recent 3 Years)

(Unit: peso)

DEO	2011	2012	2013
1) Albay Third DEO	3,789,249	3,946,681	3,878,461
2) North Samar First DEO*Note	24,456,976	37,964,532	36,733,806
3) DPWH Third DEO	3,272,000	3,070,000	2,821,000
4) Ilocos Sur Second DEO	3,634,615	3,634,615	3,634,615
5) Mountain Province DEO	4,046,616	8,773,787	8,903,987
6) Benguet Second DEO	1,522,878	1,522,878	1,522,878
7) Ilocos Norte First DEO	1,200,000	1,500,000	1,700,000

Source: Answers to the questionnaire

Note: The budget for North Samar First DEO represents the total budget for all roads and bridges under the office (i.e., including budgets for roads and bridges that are not covered by the project).

3.5.4 Current Status of Operation and Maintenance

The DEOs responsible for the roads and bridges targeted by the project formulate maintenance plans. They then carry out various maintenance works based on the developed plans. Through the field visits to the Cordillera Administrative Region, it has been observed that the roads and bridges managed by DEOs had no major operation and maintenance problems such as serious damages or bumps. However, in some parts of the mountain road (especially the (3-b) Cervantes-Sabangan Road), fallen rocks and sediment were observed, which indicates that rock removal and cleaning works are not sufficiently conducted by the respective DEO. As it was discussed earlier, it is possibly because of the shortage of site workers. It can also be because the steep mountain road makes it more difficult to carry out the needed work including transportation of materials and equipment and assignment of staff. On the other hand, concerning the operation and maintenance status of the other targeted sections, no major problems were observed in the (5) Iloilo East Coast-Capiz Road on the Panay Island presumably because it is mostly flat and easier to maintain than the roads in the Cordillera Administrative Region.

Spare parts necessary for the road and bridge maintenance are stored by each DEO. Spare parts are normally procured by inviting local suppliers to bid; however the procurement takes time for some types of parts²⁶. Each DEO has a maintenance manual. DEO staff members refer to this manual in order to carry out maintenance works.

Some problems have been observed in terms of the institutional and financial aspects of the maintenance. Therefore sustainability of the project effect is fair.

²⁶ However, maintenance has never been disturbed by the shortage of spare parts.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project improved roads and bridges for the badly conditioned sections of the arterial roads of the Philippines, with the aim of responding to increasing traffic volumes and to reduce travel time. At the time of the appraisal and ex-post evaluation, the project was consistent with the development policy of the Philippines and with the development needs for paving arterial roads, as well as for expanding and improving road networks. It was also consistent with the assistance policy of Japan; thus, the relevance of the project is high. Through the project, the initial targets have been mostly achieved in terms of average daily traffic volume capacity increases and reduction in travel time. Additionally, a beneficiary survey confirmed that the project is supporting improvements in agricultural productivity in the target areas. It is also contributing to the improvement of living conditions of the residents near the project sites, as well as to the vitalization of the local economy; thus, the project's effectiveness and impact are high. On the other hand, the project cost exceeded the plan and the project period was significantly longer than planned; thus, efficiency is low. There is a staff shortage at the District Engineering Office responsible for the operation and maintenance of the project. Furthermore, the DEO's maintenance is not necessarily sufficient because the organization has not been able to replace old heavy machinery and vehicles for many years; thus, sustainability of the project is fair.

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

4.2 Recommendations

(1) Recommendations to the Executing Agency (DPWH Headquarters)

- 1) Compensation has not been paid to landowners for the land acquisition concerning the Cervantes-Mankayan-Abatan Road at the time of ex-post evaluation. It is recommended that DPWH Headquarters and the regional office complete the verification process related to compensation as soon as possible and make efforts to accelerate the payment.
- 2) There is generally a shortage of site workers (maintenance staff) at DEOs in the areas targeted by the project. It is recommended that DPWH Headquarters increase the allocation and execution of budgets as much as possible, with a view to allocating sufficient staff and improving maintenance levels.
- 3) As many of the roads developed in the Cordillera Administrative Region are mostly

mountain roads, soil on the roadsides (cliffs) becomes fragile during the rainy season and roads are sometimes covered by sediments. While DPWH can only do so much to increase its budget and human resources, it is recommended that DPWH considers maintenance an issue and makes efforts to remove the sediments and clean the roads.

(2) Recommendations to JICA

While it is necessary to monitor DPWH's payment of compensation, it is also recommended that JICA conducts monitoring (e.g., periodically check the compensation paid) and to communicate with DPWH in order to ensure that the compensation is duly paid.

4.3 Lessons Learned

- Prompt Compensation Payment for Land Acquisition

Concerning the compensation to be paid to landowners for the acquisition of land required for the Cervantes-Mankayan-Abatan Road, it would have been feasible for DPWH to take the initiative in making the payment available based on the land acquisition plan before the commencement of construction operations. The compensation was not paid after the construction began, mainly because the DPWH Cordillera Administrative Region Office could not manage their internal activities effectively. Considering the fact that CADT, which restricted the selling and buying of land owned by indigenous people for generations, was becoming widely known around the time of the detailed design, it would have been feasible either to make the payment immediately or to promptly consider the best course of action in an effort to address the matter in a short period of time.

Comparison of the Original and Actual Scope of the Project

Item	Original	Actual
1. Project Outputs	<p>1) Civil Engineering Work (1) Ligao-Pio Duran Road in the province of Albay : Development of roads (about 21.8km) and bridges (3 places) (2) Patapat Viaduct in the province of Ilocos Norte : Protection work for the pier foundation (approx. 1.1km) (3-a) Suyo-Cervantes-Mankayan-Abatan Road in the Cordillera Administrative Region and (3-b) Cervantes-Sabangan Road : Development of roads (a total of approx. 111.4km) and bridges (10 places) (4) Catarman-Calbayog Road on the island of Samar : Development of roads (approx. 68.3km) and bridge (1 place) (5) Iloilo East Coast-Capiz Road on the Panay Island : rehabilitation of damaged roads (approx. 39.5km)</p> <p>2) Consulting Services The main TORs are to conduct detailed design (or to review the detailed design), assisting bidding, construction supervision, assisting land acquisition and resettlement, environmental monitoring on the compliance to the environmental compatibility conditions, advising on social and environmental measures implemented by the executing agency and contractors, etc. (Planned MM: a total of 604MM for the detailed design, 1,000MM for construction supervision, and 57MM for the other tasks)</p>	<p>1) Civil Engineering Work (1) Ligao-Pio Duran Road in the province of Albay : Development of road (23.6km) and bridges (3 places) (2) Patapat Viaduct in the province of Ilocos Norte : Protection work for the pier foundation (1.1km) (3-a) Suyo-Cervantes-Mankayan-Abatan Road in the Cordillera Administrative Region and (3-b) Cervantes-Sabangan Road : Development of roads (a total of approx. 108km, but partially under construction) and bridges (10 places) (4) Catarman-Calbayog Road on the island of Samar : Development of roads (47.33km) and bridge (1 place) (5) Iloilo East Coast-Capiz Road on the Panay Island : rehabilitation of damaged roads (39.0km)</p> <p>2) Consulting Services The TORs listed on the left-hand column were executed as planned. (Actual MM: 947.17MM for the detailed design, 2,126.41MM for construction supervision, and 185.2MM for the other tasks)</p>
2. Project Period	May 2001-January 2007 (69 months)	May 2001-March 2014 (155 months)
3. Project Cost		
Amount paid in Foreign currency	6,792 million yen	3,707 million yen

Amount paid in Local currency	4,267 million yen	7,243 million yen
Total	11,059 million yen	10,950 million yen
Japanese ODA loan portion	8,294 million yen	7,773 million yen
Exchange rate	1PHP=2.8JPY (May 2001)	1PHP=2.17JPY (average rate for the project period)

Republic of the Philippines

Ex-Post Evaluation of Japanese ODA Loan

“Iloilo Flood Control Project (I) (II)”

External Evaluator: Kenichi Inazawa, Octavia Japan Co., Ltd.

0. Summary

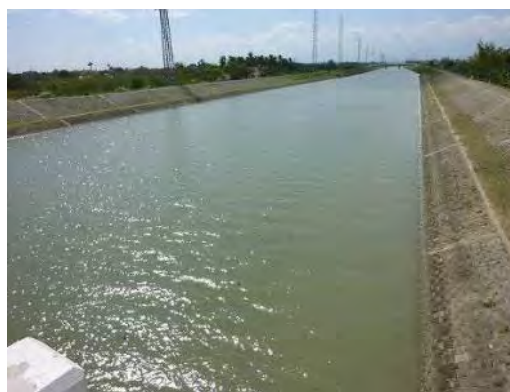
This project implemented river improvement works (Iloilo River, Jaro River, Aganan River, Tigum River and Upper Ingore Creek) in Iloilo City and Pavia Municipality, Panay, Visayas, in the central Philippines, with the aim of mitigating flood disasters. At the time of the appraisal and ex-post evaluation, the project is consistent with the country’s development policy concerning flood control and disaster mitigation. It is also consistent with development needs such as flood control infrastructure development. Thus, the relevance of the project is high. With river improvement works implemented through the project, initial targets were achieved in terms of discharge capacity and it became possible to respond to a 20-year return period flood. Since the completion of the project, no water overflow or flood has occurred due to heavy rain or typhoons, with no financial damage or damage to households. In addition, according to beneficiary survey results, improvements have been observed in terms of health, sanitation and living environment as a result of the reduction in flood disasters. Thus, the effectiveness and impact of the project is high. However, the project costs and project period significantly exceeded the initial plan; thus, efficiency is low. On the other hand, no major problems have been observed in terms of the institutional, technical and financial aspects of the operation and maintenance carried out by the executing agency; thus, project sustainability is high.

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

1. Project Description



Project Location



Jaro Floodway Constructed by the Project

1.1 Background

As the Philippines is located in the tropics, many of the typhoons generated in the Pacific Ocean hit the Philippines every year, exposing the country to difficult geographical and metrological conditions. Many towns are located in the lowlands and are therefore more likely to be affected by floods, especially in the rainy seasons. The total damage resulting from natural disasters was 11,381 million peso in 1999, prior to the appraisal of the project, which accounted for approximately 0.4% of the country's GNP at the time. As such, it was a serious factor hindering the economic and social development of the country.

Iloilo City, capital of the Iloilo region in the Province of Iloilo, located in Panay (West Visayas) in the central Philippines, was expected to become the center for West Visayas's economic growth, having the seventh largest population in the country at the time of the appraisal of the project. However, geographically, the city consists largely of plains with an average elevation of 3m above sea level and is regularly affected by floods caused by typhoons and torrential rain. Prior to the commencement of the project, the entire city had been flooded in July 1994, affecting about 25,000 households. The city was also devastated by six flood cases between 1998 and 2001 (affecting 119,028 households in total). Therefore, there was an urgent need for implementing flood control measures such as river-facility developments, with a view toward mitigating flood-related disasters.

1.2 Project Outline

The objective of the project is to mitigate flood damages in the target areas by implementing flood control works for the major rivers of the Province of Iloilo, Panay, Visayas in the central Philippines, thereby contributing to the improvement in sanitary and living conditions of the residents and to the economic development.

Loan Approved Amount/ Disbursed Amount	Phase I: 458 million yen / 338 million yen
	Phase II: 6,790 million yen / 6,728 million yen
Exchange of Notes Date/ Loan Agreement Signing Date	Phase I: September 1998 / September 1998
	Phase II: March 2002 / March 2002
Terms and Conditions	(Phase I & II) Main Construction: Interest Rate: 1.7%, Repayment Period 30 years (Grace Period 10 years), Condition for Procurement: General Untied Consulting Service: Interest Rate: 0.75%, Repayment Period 40 years (Grace Period 10 years), Condition for

	Procurement: Bilateral Tied
Borrower / Executing Agency(ies)	The Government of the Philippines / The Department of Public Works and Highways (DPWH)
Final Disbursement Date	Phase I: January 2002
	Phase II: September 2010
Main Contractor (Over 1 billion yen)	Phase I: N/A
	Phase II: Hanjin Heavy Industries & Construction Co., Ltd. (South Korea) (Contract Package I), China International Water & Electric Corporation (China) (Contract Package II)
Main Consultant (Over 100 million yen)	Phase I: CTI Engineering Co. Ltd. (Japan) / Basic Technology and Management Corporation (the Philippines) / Woodfields Consultants Inc. (the Philippines) (JV) Phase II : (Component 1)CTI Engineering International Co., Ltd. (Japan) / Basic Technology and Management Corporation (the Philippines) / Woodfields Consultants Inc. (the Philippines) (JV), (Component 2) CTI Engineering International Co., Ltd. (Japan) / Wood Fields Inc. (the Philippines) / Pertconsult International (the Philippines) (JV)
Feasibility Studies, etc.	F/S “Iloilo Flood Control Project” JICA (February 1995)
Related Projects	(Technical Cooperation) Dispatch of experts (river management) (Technical Cooperation) “The Project for Enhancement of Capabilities in Flood Control and Sabo Engineering of DPWH” (January 2000 – June 2005) (Technical Cooperation) “Strengthening the Flood Management Function of DPWH” (July 2005–June 2010) (Technical Cooperation) “Community Based Adaptation and Resiliency against Disasters” (April 2012 – March 2015)

2. Outline of the Evaluation Study

2.1 External Evaluator

Kenichi Inazawa (Octavia Japan Co., Ltd.)

2.2 Duration of Evaluation Study

Duration of the Study: November 2013 - December 2014

Duration of the Field Study: March 3 - 16, 2014, May 18 - 25, 2014

3. Results of the Evaluation (Overall Rating: B¹)

3.1 Relevance (Rating: ③²)

3.1.1 Relevance to the Development Plan of the Philippines

At the time of the appraisal of the project, the government of the Philippines formulated the “Medium-Term Philippine Development Plan” (1993-1998), which emphasized the importance of disaster prevention and flood disaster mitigation through the development of flood control infrastructures. The subsequent “Medium-Term Philippine Development Plan” (2001-2004) aimed for the continued development of flood control infrastructures of the industrial and agricultural regions in Metro Manila and flood-prone areas as well as for the realization of integrated river basin management including afforestation.

At the time of ex-post evaluation, the “Mid-Term Philippine Development Plan” (2011-2016) places an emphasis on the necessity of conserving river basins and developing efficient infrastructures in order to mitigate flood risks. The following strategies are proposed to realize the plan: (1) prioritizing the construction of flood control infrastructures in flood-prone areas; (2) incorporating climate change adaptation measures in the planning and designing of flood control infrastructures; (3) developing a mechanism which allows prompt fund allocation for the restoration and rehabilitation of flood control infrastructures; and (4) promoting the participation of Local Government Units (LGUs) and others in the maintenance of flood control infrastructures and disaster mitigation measures. It can be observed that flood control and anti-disaster measures were and continued to be important at the time of the appraisal and ex-post evaluation of the project; therefore, it can be judged that there is consistency with the development policy.

3.1.2 Relevance to the Development Needs of the Philippines

At the time of the appraisal of the project, Iloilo City had the seventh largest population in the country and was expected to become the center for economic development of West Visayas. However, the city was regularly affected by floods because geographically it consists largely of

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

² ③: High, ② Fair, ① Low

plains with an average elevation of 3m above sea level. Torrential rain which hit the area in July 1994 almost flooded the entire city, affecting about 25,000 households. Additionally, the city was devastated by six flood cases between 1998 and 2001 (totally 119,028 households were affected). Therefore, it was an urgent task for the city to implement flood control measures.

In response to such a situation, the project constructed floodways and carried out river improvement works with the aim of responding to a 20-year return period flood (1/20 exceedance probability³) initially and then later on to a 50-year return period flood with the subsequent project⁴. As a result, there has been no single flood associated with heavy rains or typhoons (disasters associated with river flooding⁵ such as that of Iloilo River, Jaro River, Aganan River and Tigum River) since the completion of the project. On the other hand, the city continues to experience flooding from drainage and small rivers (inland flood) in parts of the project area in Iloilo City and Pavia Municipality, which needs to be addressed in both cities. The Department of Public Works and Highways (hereinafter referred to as “DPWH”), the executing agency of the project, is currently formulating a master plan for the drainage development. In addition, DPWH is formulating the subsequent project which aims to make the entire Iloilo City and Pavia Municipality resilient to a 50-year return period flood as mentioned above. In light of the above, it can be said that there continue to be high development needs for flood control facilities at the time of ex-post evaluation.

3.1.3 Relevance to Japan’s ODA Policy

The Country Assistance Plan for the Philippines, which was developed by the Ministry of Foreign Affairs of Japan in August 2000, identified the following priority fields: (1) “strengthening the economy and overcoming growth constraints toward sustained economic growth”; (2) “rectification of disparities (alleviating poverty and redressing regional disparities)”; (3) “environmental protection and anti-disaster measures”; and (4) “human resources development and institution building.” Out of these, it was stipulated in (3) that

³ Exceedance probability indicates scales of floods. Every how many years a flood is likely to occur on average is expressed as a percentage.

⁴ “The project” in this evaluation report represents the phase I and II of the “Iloilo Flood Control Project”. It is also referred as “Stage I”. In terms of the subsequent project which is individually planned by the government of the Philippines, it is referred to as “Stage II.” As described in the paragraph, the project constructed floodways and carried out river improvement works with the aim of responding to a 20-year return period flood initially and then to a 50-year return period flood with the subsequent project. In terms of the project outputs, it will be explained at “3.4. Efficiency.”

⁵ River flooding is a phenomenon that water flows over or breaks a dike thereby flooding houses and agricultural lands. Inland flood, on the other hand, refers to a flood caused by water discharged to rivers and drainages because of insufficient drainage capacity; and it occurs even if water does not flow over a dike. (Source: the Ministry of Land, Infrastructure, Transport and Tourism of Japan)

“because frequent large-scale natural disasters constrain development, and also tend to impact more heavily on the poor, we will continue to provide aid for flood and sand control and earthquake-related measures, while also assisting in developing the necessary systems and capacity in related government institutions from a medium- to long-term perspective.” In addition, JICA prepared its “Medium-Term Policy for Overseas Economic Cooperation Operations” in December 1999, which highlighted development issues of and assistance policy for the Philippines. The policy identified the following priority fields: (1) “making economies more resilient and overcoming constraints in order to achieve sustainable growth (e.g., appropriate macroeconomic management, reinforcing industrial structures, and developing economic infrastructures)”; (2) “poverty alleviation and correction of regional disparities”; (3) “environmental protection including disaster prevention as well as disaster prevention measures”; and (4) “human resource development and system building.”

The project provided supports for the strengthening of disaster prevention functions of the Philippines and is consistent with (3) “environmental protection and anti-disaster measures”, one of the priority fields of the above-mentioned Country Assistance Plan for the Philippines. It is also in line with (3) “environmental protection including disaster prevention as well as disaster prevention measures” found in the Medium-Term Policy for Overseas Economic Cooperation Operations. It is thus consistent with the assistance policy of Japan.

The project has been highly relevant to the country’s development plan, development needs, as well as Japan’s ODA policy. Therefore its relevance is high.

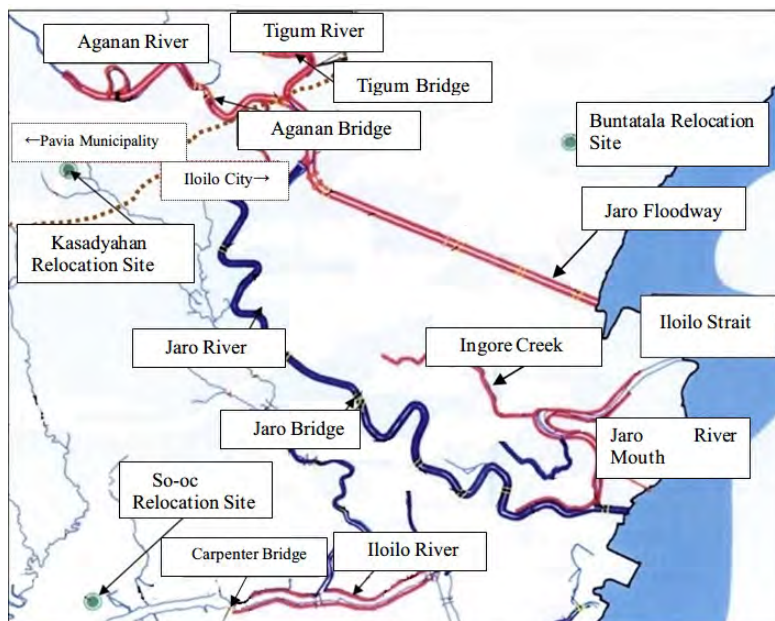


Figure 1: Locations of the Project Sites

3.2 Effectiveness⁶ (Rating: ③)

3.2.1 Quantitative Effects (Operation and Effect Indicators)

1) Discharge Capacity and Maximum Water Level

The project implemented river improvement works for the main rivers in Iloilo City and Pavia Municipality (Iloilo River, Jaro River, Aganan River and Tigum River) with the aim of mitigating floods so that they would be resilient to a 20-year return period flood. As a result, discharge capacity⁷ improved and became more than what was targeted at all measurement points (Table 1). It can be observed that the river cross sections (river width and dike height) have been secured as a result of the river improvement works of the project, which led to the improvement in discharge capacity.

Table 1: Changes in the Discharge Capacity
at the Time of the Project Appraisal and at the Time of Ex-Post Evaluation

(Unit: m³/second)

Indicator	Measurement Point	Before the Project Commencement		At Ex-Post Evaluation
		Baseline (1998)	Target (2007)	Actual (2013)
Discharge Capacity	(1) Jaro Bridge ⁸	204	150	150
	(2) Aganan Bridge	260	550	800
	(3) Tigum Bridge	354	450	600
	(4) Carpenter's Bridge	296	350	350

Source: JICA appraisal document (at the time of the project appraisal), questionnaire answers (at the time of ex-post evaluation)

Note: The measurement points ((1)-(4)) are shown in Figure 1: Locations of the Project Sites

On the other hand, maximum water levels⁹ could not be reviewed or analyzed because the regional office of DPWH responsible for the operation and maintenance of the project (hereinafter referred to as “the Regional Office VI¹⁰”) did not measure maximum water levels during heavy rains and typhoons at the measurement points shown in Table 2¹¹. According to

⁶ Sub-rating for Effectiveness is to be put with consideration of Impact.

⁷ It refers to a water volume which can flow without flooding at a certain measurement point.

⁸ It was expected that the discharge capacity of Jaro Bridge would decrease from 204m³/second at the time of the project appraisal to 150m³/second at the time of ex-post evaluation, unlike the other three bridges. It is because a flood way was planned to be constructed in Jaro River as part of the project, and it was expected that some water in Jaro River would be diverted to the flood way. (Refer to Figure 1: Locations of Project Sites.) Therefore, the reduction in the discharge capacity at Jaro Bridge was anticipated at the initial planning stage.

⁹ It is a quantitative indicator to evaluate whether the water level is within a safe range at a flood control reference point during floods. The highest water level (meter elevation) of the year is measured at a flood control reference point.

¹⁰ Their mandate is to measure river water levels after the project completion.

¹¹ However, the Regional Office VI is formulating a plan for the procurement and introduction of water gauge equipment as of May 2014. Thus it can be expected that river water levels will be measured during heavy

the Regional Office VI, while there were four heavy rains/typhoons of about 5-20 year exceedance probability in the targeted areas since the completion of the project, there has not been any damage thanks to the project which made the areas resilient to a 20-year return period flood¹². It is presumed that damage would have been significant had there be no project.

Table 2: Actual and Target Maximum Water Level before the Project Commencement

(Unit: meter elevation)

Indicator	Measurement Point	5-year Return Period		10-year Return Period		20-year Return Period	
		Before Commencement	After Completion	Before Commencement	After Completion	Before Commencement	After Completion
Maximum Water Level	(1) Jaro Bridge	8.00	4.40	8.60	4.70	9.30	5.20
	(2) Aganan Bridge	13.60	12.94	14.50	13.64	15.30	14.23
	(3) Tigum Bridge	2.42	1.00	13.04	11.80	13.78	12.70
	(4) Carpenter's Bridge	1.40	1.40	1.60	1.60	1.80	1.80

Source: JICA appraisal document

2) Changes in the Damage and the Number of Affected Households in Iloilo City

As it was discussed above, there has not been any flood-related disaster since the completion of the project, nor has there been any problem of overflow (river flooding). Table 3 shows that the amount of damage and the number of affected households were significant at the time of the appraisal of the project; and there are none after the project completion.

Table 3: Changes in the Damage and the Number of Affected Households in Iloilo City

Indicator	5-year Return Period		10-year Return Period		20-year Return Period	
	Before Commencement	After Completion	Before Commencement	After Completion	Before Commencement	After Completion
Amount of Damages in Iloilo City (million peso)	589	0	713	0	863	0
The Number of Affected Households in Iloilo City (no. of households)	16,191	0	19,242	0	21,990	0

Source: JICA appraisal document (before commencement), the answers to the questionnaire and results of the interviews with Iloilo City Government (after completion)

rains/typhoons in the future.

¹² A super typhoon (Frank), which was said to be a 50-year return period typhoon, hit the area in June 2008. Heavy rain and increased water levels caused river flooding, significantly affecting all parts of Iloilo City and Pavia Municipality. It will be discussed further in Output under Efficiency.



Photo 1: Flood before the Commencement of the Project (Iloilo City)



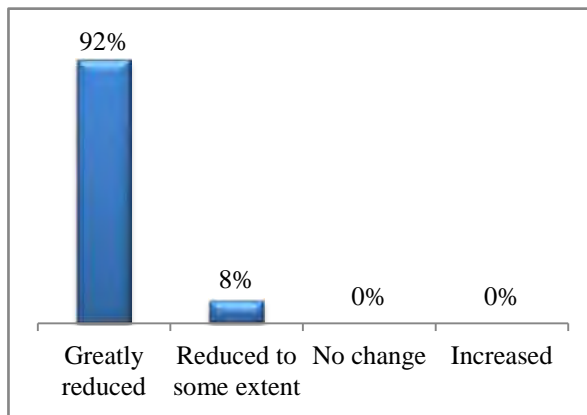
Photo 2: Tigum River after the River Improvement Works

3.2.2 Qualitative Effects (Mitigating Flood Disasters)

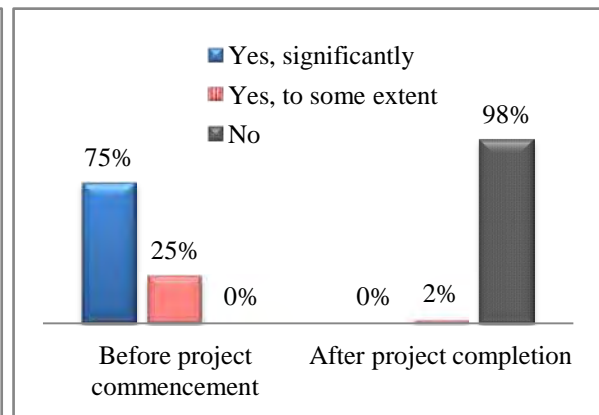
A beneficiary survey was conducted targeting the residents of Iloilo City and Pavia Municipality concerning the reduction in flood frequency and flood damage attributed to the project. Samples were drawn based on the random sampling method (123 persons¹³), and it used a questionnaire. The beneficiary survey results are reviewed below.

The main results are shown in Figure 2. Question 1 was about reduction in flood frequency. All the respondents answered “greatly reduced” or “reduced to some extent”; thus it can be observed that flood related disasters have decreased. Additionally, from Question 2-5 it can be observed that the damage to the basic infrastructures, including inundation above floor level, casualties and damages to the household goods and infrastructures such as electricity and water supply systems, significantly reduced after the project implementation. In addition, as Question 6 shows, many people responded that flood damages to roads and public transportations generally reduced as well. According to the beneficiaries who were interviewed, they commented, “There were floods frequently before the commencement of the project. Every time flood damages occurred, we had to do major repairs or rebuild houses, but there is no need for that now.” Based on this comment in addition to the survey results shown in Figure 2, it can be judged that the frequency and damages of flood significantly reduced after the project completion as compared to before the commencement of the project.

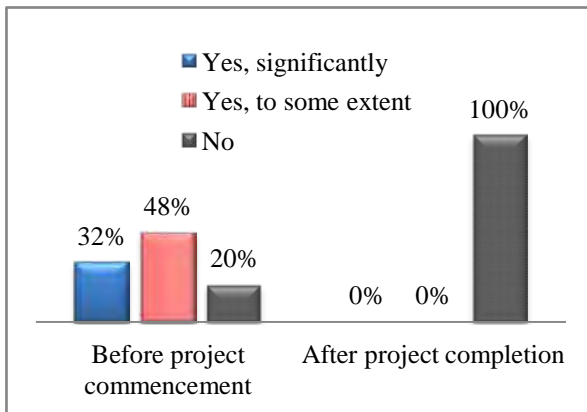
¹³ Respondents are composed of the following: 21% men and 79% women, 2% in their 20s, 16% in their 30s, 34% in their 40s, 31% in their 50s and 17% in their 60s.



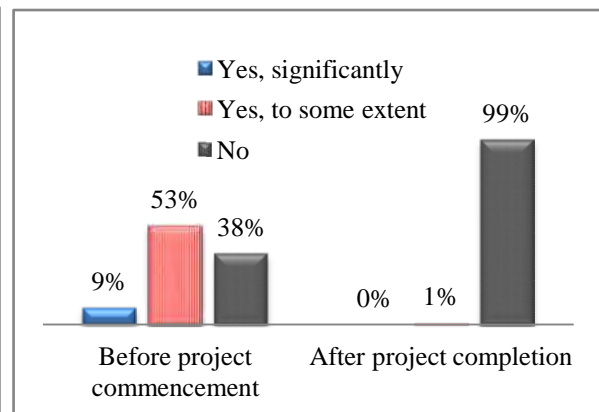
Question 1: Do you think the flood frequency reduced?



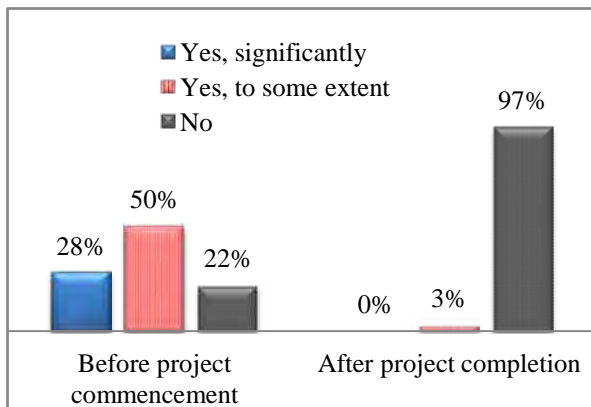
Question 2: Did dirt, mud, trash or other debris enter into the house due to floods?



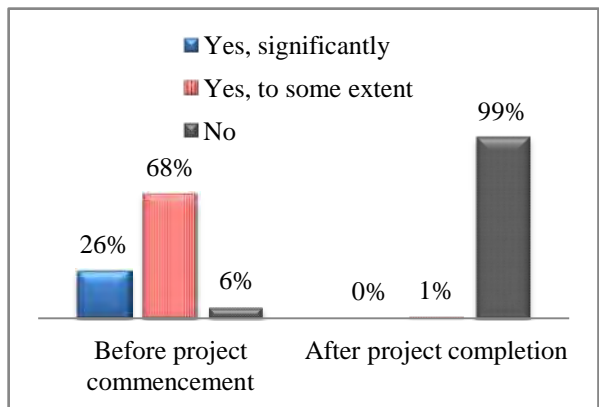
Question 3: Were there damages to household goods due to floods before and after the project?



Question 4: Were there damages to human due to floods before and after the project?



Question 5: Were there damages to the infrastructures (electricity, water supply and communication facilities) due to floods before and after the project?



Question 6: Were there damages to roads and public transportations due to floods before and after the project?

Figure 2: The Results of the Beneficiary Survey
(Reduction in Flood Disasters)

In addition, according to the interviews with Iloilo City Government and Pavia Municipality Government, they commented, “Thanks to the completion of the project, there are less concerns about floods. There was a lot of anxiety about flood during the typhoon season every year, but now, citizens are feeling safer.” Therefore, it can be judged that the project has not only mitigated flood disasters but also brought a feeling of safety to the citizens.

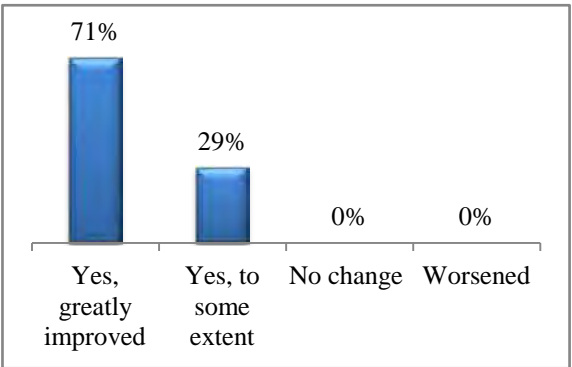
3.3 Impact

3.3.1 Intended Impacts

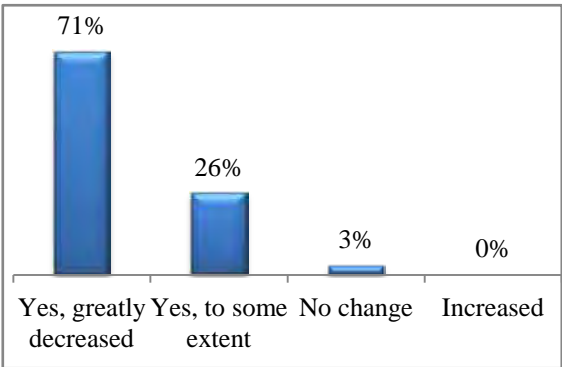
3.3.1.1 Improvement in the Sanitation and Living Conditions in the Target Areas

Iloilo City used to be attacked by frequent typhoons at the time of the appraisal of the project. The typhoon of July 1994 caused large-scale flooding (affecting roughly 25,000 households) in the city, having a serious impact on health and sanitation of the local residents. It was thus expected that the project would lead to the improvement in living conditions of the local residents by reducing flood related disasters.

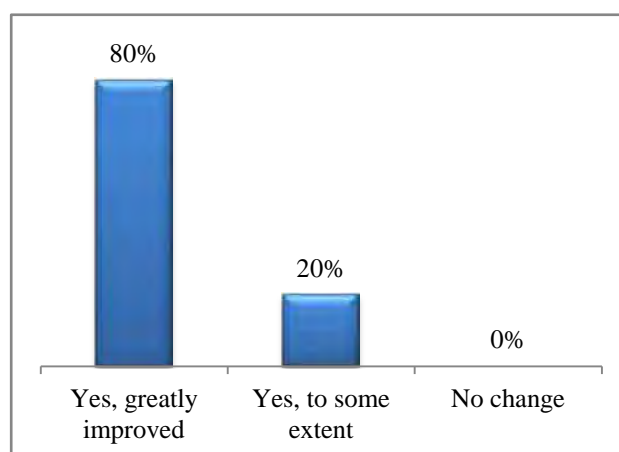
The beneficiary survey, which was conducted as part of this evaluation study, also looked into such aspects. As it can be seen from Question 7-8 shown in Figure 3, a large proportion of the local residents think that sanitation and living conditions have improved and waterborne infections have reduced as a result of the development of river facilities by the project. Additionally, as it can be seen from Question 9, a large proportion of the respondents said that the security situations improved in their neighborhoods. Therefore, it can be judged that the project is contributing to the improvement in health, sanitation and living conditions of the residents.



Question 7: Do you think the implementation of the project has contributed to the improvement in the sanitation of the area?



Question 8: Do you think the implementation of the project has led to a reduction in waterborne infections?



Question 9: Do you think the security of the area has improved as a result of the implementation of the project?

Figure 3: Results of the Beneficiary Survey
(Improvement in Sanitation and Living Conditions)

3.3.2 Other Impacts

3.3.2.1 Impacts on the Natural Environment

At the time of the project appraisal, it was confirmed that mangrove forests existed near the project sites, such as near the mouths of Jaro River and Jaro floodway. This is why mangrove was reforested by the project, and impacts on the mangrove forests were monitored. No particular negative impacts were observed. The mangrove reforestation is also contributing to the improvement in the landscape of the areas around the project sites.

Additionally, at the time of the appraisal of the project, it was anticipated that the areas near the Jaro floodway construction site might be affected by saltwater intrusion. It was thus required that the impacts on the well water near the downstream of the floodway and the water intake should be monitored. Counter measures against saltwater intrusion were also needed in case any negative impact was observed. These measures were taken as planned. According to the Regional Office VI, no saltwater intrusion to the well water or the water intake is observed at the time of ex-post evaluation.

There were no major problems associated with air or water pollution, wastes and noise throughout the project implementation period. With regard to the issue of noise, some noticeable noise occurred during the construction for the river improvement; however, the contractor gave sufficient consideration during the construction (mainly by being thoughtful of the construction hours). As a result, there was no complaint from the residents.

The Environment Impact Assessment (EIA) was conducted prior to the appraisal. The Environmental Compliance Certificate (ECC) was issued by the Department of Environmental and Natural Resources (DENR) in April 1998.

With regard to the institutional arrangement for the environmental monitoring, the Planning and Design Department of the Regional Office VI is responsible. They periodically monitor the project sites and the surrounding areas. According to the Department, there has been no negative environmental impact since the completion of the project.

3.3.2.2 Land Acquisition and Resettlement

Concerning resettlement, 505 households were relocated as shown in Table 4. The Resettlement Monitoring Task Force (RMTF) was formed by different stakeholders during the project¹⁴. The households subject to resettlement were briefed, advocacy works were conducted, and the progress was monitored.

Table 4: The Planned and Actual Number of Resettled Households and Land Acquired

		Initial Plan	Actual
Resettlement (Unit: household)	(1) Illegal settlers	416	398
	(2) Landowners	109	109
	Total	525	505
Acquired land near the rivers targeted by the project (Unit: ha)		99.0	83.7

Source: the Regional Office VI

With regard to the land acquired near the river improvement construction sites¹⁵, as shown in Table 4, 83.7ha was acquired, which was slightly less than the initial plan (99ha). It is because the riverbanks were gradually eroded by the river stream during the project appraisal and implementation, as a result of which the area subject to land acquisition decreased¹⁶. The compensation paid to the landowners was about 1.25 billion peso in total. The payment of the compensation was made smoothly based on the mutual agreement between DPWH and the landowners.

On the other hand, Buntatala (2.6ha) and So-oc (1.8ha) in Iloilo City were developed as relocation sites through the project, as it will be discussed in “3.4.1 Output” under Efficiency. In the project a total of 505 households including illegal settlers and landowners were relocated to the above-mentioned two sites as well as to Kasadyahan (4.3ha) in Pavia Municipality

¹⁴ This taskforce consisted of Iloilo City Government and Pavia Municipal Government, the National Housing Authority (NHA), Iloilo City Urban Poor Federation, Inc. (ICUPFI) and other community based organizations. The taskforce monitored the progress of resettlement and land acquisition. According to the city/municipal government of Iloilo City and Pavia Municipality, the activities functioned smoothly.

¹⁵ Mainly, these are lands occupied by illegal settlers and lands owned by landowners.

¹⁶ The landowners showed their understanding of the matter.

developed as a relocation site by the National Housing Authority (NHA) under another project. With a view to ensuring smooth resettlement, the Regional Office VI covered the resettlement costs including the cost of relocation while providing food for some time. According to the resettled residents (So-oc) who were interviewed, they commented, “We were a little anxious before the resettlement. But now after the resettlement, we are satisfied with the relocation site. In So-oc, we have a health center, markets and schools as well as water supply service. Before the relocation, we used to live in areas where such facilities were geographically dispersed and not easily accessible. Here, on the other hand, the site has been developed in such a way that those facilities are close to each other¹⁷. So we can say that we have a good environment for living. Security is also good, and it is quiet here.” Based on such a comment, it can be judged that the resettlement process was carried out smoothly and that the level of satisfaction is high concerning the living conditions after the resettlement.



Photo 3: Relocation Site
(So-oc)



Photo 4: Facilities Developed in So-oc
(From front: church and water tower)

3.3.2.3 Unintended Positive/Negative Impact

1) Enhanced Understanding for the Project through Information Education Campaign and the Impact on Environment

The “Information Education Campaign” was held during the implementation of the project. This was mainly carried out by the consultant employed under the project and the Regional Office VI through radio broadcasting, TV commercials, distribution of calendars and posters with the aim of publicizing the necessity/importance of the project, the expected effects/impacts and the importance of maintaining the facilities to the local residents. Residents near the project sites commented in the interviews, “We were able to understand the necessity of the river improvement works. The project was meant to protect our livelihoods.” Thus it can be judged that the residents’ understanding for the project has been deepened.

As part of the project, Material Recycle Facilities (hereinafter referred to as “MRF”) were

¹⁷ The facilities were developed within the relocation sites with the view of improving accessibility.

constructed with the objective of preventing illegal waste disposal and promoting proper waste disposal. It has been confirmed through the interviews with the local barangays as well as Iloilo City Government and Pavia Municipality Government that the amount of waste dumping decreased through the utilization of MRF after the completion of the project. For example, in the case of Iloilo River, the amount of waste from the river has significantly reduced from 10-15 large trucks/week at the time of the project appraisal to 2-3 trucks/week after the project completion. At the time of ex-post evaluation the MRF are mainly managed by the barangays around the project sites and Iloilo City Government, while the Regional Office VI expressed their will to continue hosting seminars on the means of utilizing MRF and proper waste disposal. Based on the above facts, it can be judged that the utilization of MRF is contributing to the improvement in the landscape of the areas near the project sites and to the improvement in the environmental awareness.

2) Impact of the Promenade Construction along the Rivers on Tourism

Promenades were constructed by the initiative of Iloilo City Government in some parts along the rivers that have been improved by the project. The promenades have become recreation areas for tourists who visit Iloilo City and also for the local residents. Hotels and restaurants have been constructed along the promenades, and the areas are lively. It is believed that the flood reduction as a result of the project has assured the safety and these buildings have been constructed. In addition, there exists a mangrove forest along the promenades, which is presumably contributing to the improvement in the environmental awareness of the tourists and visitors.



Photo 5: An Example of Material Recycle Facilities (MRF)



Photo 6: Promenade (mangrove forest exists between the promenade and the river)

The project has largely achieved its objectives. Therefore its effectiveness and impact are high.

3.4 Efficiency (Rating:①)

3.4.1 Project Outputs

Table 5 shows the planned and actual outputs of the project.

Table 5: The Planned and Actual Outputs of the Project

Plan (At the Time of the Appraisal)	Actual (At the Time of Ex-Post Evaluation)
【Iloilo Flood Control Project (I)】 ■ Consulting service for the detailed design (detailed design, preparation of tender documents, a river environment improvement study and others: 193MM in total: 93MM for international consultants, 100MM for local consultants) and the cost related to the development of relocation sites	【Iloilo Flood Control Project (I)】 ■ The consulting service for the detailed design was provided as planned. (305.48MM in total: 80.75MM for the international consultants, 224.73MM for the local consultants.) As for the development of the relocation sites, 2.6ha of land was developed in Buntatala, Iloilo City.
【Iloilo Flood Control Project (II)】 1) Civil Works a) River Improvement Aganan River improvement: 3.9km Tigum River improvement: 2.0km Improvement of upper Jaro River: 1.0km Improvement of the mouth of Jaro River: 5.6km Improvement of midstream of Iloilo River: 4.2km Improvement of upper Ingore creek: 3.0km & associated bridge construction: 3 bridges b) Construction of Floodway Construction of Jaro floodway: 4.8km / associated bridge construction: 3 bridges c) Development of Relocation Sites Development of relocation sites for the residents subject to resettlement: 22.5ha (So-oc: 2.5ha, San Isidro: 20ha) 2) Consulting Service ■ Component 1 (Main Tasks) a) Support for the procurement; b) Construction management; c) Operation and maintenance training for DPWH and Iloilo City Government staffs; and d) Environment management (impacts on water quality, noise,	【Iloilo Flood Control Project (II)】 1) Civil Works a) River Improvement Aganan River improvement: <u>4.26km</u> Tigum River improvement: as planned Improvement of upper Jaro River: as planned Improvement of the mouth of Jaro River: as planned Improvement of midstream of Iloilo River: <u>3.8km</u> Improvement of upper Ingore creek: as planned & associated bridge construction: as planned b) Construction of Floodway Construction of Jaro floodway: as planned Associated bridge construction: <u>4 bridges</u> c) Development of Relocation Sites Development of relocation sites for the residents subject to resettlement: <u>1.8ha</u> (1.8ha was developed in So-oc only as <u>the planned 20ha in San Isidro was canceled</u>) 2) Consulting Service ■ Component 1 (Main Tasks) Mostly implemented as planned. (However, the actual workload was more than planned because the construction expanded in scale.)

<p>air and natural environment, environmental monitoring on excavated sediment, and support for the development and implementation of the mangrove reforestation plan, etc.) (Planned MM) 458MM (international: 171MM, local: 287MM)</p> <p>■ Component 2 (Main Tasks) e) Support for the resettlement measures (including assisting the resettlement procedures, assisting the land acquisition and compensation process, assisting the monitoring to prevent resettled residents from returning to the project sites, assisting the development of livelihoods improvement program); f) Support for the advocacy works targeted at local residents (campaigns to explain the benefits of rivers to the life of the citizens, the importance of flood management, prevention of illegal waste disposal, prevention of riverside occupation by illegal settlers and maintenance of the river facilities, etc.); g) Studies on the sediment in upper Iloilo River and Jaro River and the current situation of the forest; and h) Review of the waste disposal plan of Iloilo City (Planned MM) 393MM (international: 63MM, local: 330MM)</p>	<p>(Actual MM) <u>610.34MM</u> (international: 188.81MM, local: 421.53MM) ■Component 2 (Main Tasks) The tasks listed in the left-hand column were carried out mostly as planned. (However, the task e) was scaled back.)</p> <p>(Actual MM) 308.45MM (international: 72.26MM, local: 236.19MM)</p>
	<p>【Additional Output】 a) The super typhoon (Frank) which occurred in 2008 damaged one section of the river which had been improved by the project. Repair work was done and riverbank protection concrete walls were constructed; and b) three above-mentioned MRF were constructed along the rivers targeted by the project; while additional 14 MRF were constructed after the Information Educational Campaigns as a result of the recognition of their usefulness (= 17 MRF in total)</p>

The reasons for the discrepancies between the plan and the actual outputs shown in Table 5 are explained below:

【Iloilo Flood Control Project (I)】

The actual MM for the detailed design was more than the plan because it took longer to identify the relocation sites than expected, which will be explained in the project period section.

In fact, Buntatala was selected as a relocation site to be developed; and roads, water supply and electrification facilities were developed within this site (2.6ha).

【Iloilo Flood Control Project (II)】

1) Civil Works

Both “a) River Improvement” and “b) Construction of Floodway” were implemented mostly as planned. As for the improvement section of Aganan River, the actual is slightly more than the plan because it was found at the time of the detailed design that soil was fragile in some places on both sides of the upstream and it became necessary to expand the construction work for the concrete riverbank protection walls. The improvement work for the midstream of Iloilo River turned out to be slightly less than the plan because the project scope had to be re-examined at the time of the detailed design, as a result of which 3.8m extension was judged to be appropriate. The number of bridges constructed along Jaro floodway became four due to a change made at the time of the detailed design. It was because residents living in the relatively populous areas on both sides of Jaro floodway demanded that access should be improved¹⁸.

With regard to “c) Development of Relocation Sites”, only 1.8ha was developed in So-oc whereas the initial plan was to develop 2.5ha of land. It is because out of the residents to be resettled mainly Pavia citizens opted for relocation within the same municipality during the course of the procedure¹⁹. With regard to San Isidro, the plan of developing 20ha of the relocation site was canceled because from the beginning this 20ha of land was meant for Stage 2, which is the subsequent project of the project. In other words, although it was included in the original plan in consideration of the progress of Stage 2, it turned out that there were more illegal settlers than expected who would be subject to resettlement under Stage 2 (2,800-3,000 persons). Given that many problems needed to be addressed in relation to resettlement, it was judged that developing it as part of the Stage 2 project in the future would be more realistic.

2) Consulting Service

The actual MM of Component 1 exceeded the plan because the construction was expanded in scale due to the additional construction shown in Table 5. On the other hand, the actual MM was less than the plan for Component 2 because the development of the above-mentioned relocation site (development of 20ha in San Isidro) was postponed, as result of which workload in relation to “e) Support for the resettlement measures” reduced from the plan.

Given that all of the above discrepancies and changes have logical explanations and that it

¹⁸ More concretely, they requested that they wanted to be able to easily move between the two sides of the river.

¹⁹ These residents were relocated to Kasadyahan area which had been developed by the National Housing Authority (NHA) prior to the commencement of the project.

can be judged that these responses were realistic in order for the project to carry on, it can be judged that the changes made to the outputs were appropriate.

3.4.2 Project Inputs

3.4.2.1 Project Cost

The total project cost was planned to be 10,448 million yen (out of which 7,248 million yen was to be funded by ODA loan), whereas in reality the project cost was 12,841 million yen (out of which 7,068 million yen was financed by ODA loan), which was slightly more than planned (123% of the plan). The cost exceeded the plan because of the following: (1) The super typhoon (Frank) which occurred in June 2008, which is said to be a 50-year return period typhoon, damaged the structures such as riverbank protection walls that were being improved at the time. As it became necessary to carry out additional construction works, the construction cost increased (roughly 2.8 billion yen more for the total construction cost); and (2) Concerning the land acquisition, as the development of economic and infrastructures advanced during the project implementation in Iloilo City and Pavia Municipality, agricultural lands were turned into commercial and residential areas, which increased the land acquisition cost²⁰ (roughly 1.5 billion yen more for the total land acquisition cost)²¹.

3.4.2.2 Project Period

The project period was planned to be 75 months (Phase I: 14 months from September 1998 to October 1999, Phase II: 61 months from March 2002 to March 2007). In reality it was significantly delayed and took 162 months (Phase I: 40 months from September 1998 to December 2001, Phase II: 122 months from March 2002 to April 2012)²², which was 216% of the plan. The reasons for the delay are as follows: (1) It took longer to identify and negotiate the relocation sites; (2) It took time to process the bidding on the contractor; (3) The allocation of the local currency was delayed because the Philippine government chose to tighten its fiscal policy²³; (4) The process of land acquisition was delayed due to the prolonged negotiation with landowners; and (5) The riverbank protection slope and others were damaged by the super

²⁰ It is because agricultural and mixed land tends to be cheaper to acquire.

²¹ The cost for this scope increased (4.3 million yen in total) while there was some reduction in cost concerning the above-mentioned cancellation of the relocation site development (although the net decrease is not unknown); and at the end the total cost is more than what was planned.

²² It was completed in April 2012, which is when the facilities began providing services (the start of the use of the river facilities after completion of the civil works).

²³ It took significant time to obtain the approval from the National Economic and Development Authority (NEDA), for the amount exceeded the planned project cost. Especially, all budget approvals were delayed including that for ODA loan projects due to the tight fiscal policy of the Philippine government from FY2003 to FY2005.

typhoon (Frank) which occurred during the project implementation; and additional construction works were carried out. While the civil works were completed by April 2012, the contractor of Contract Package I for the main construction²⁴, a contractor of the project has not handed over the improved facilities to DPWH at the time of ex-post evaluation (March 2014). Currently, the contractor is conducting an inspection upon facility completion and making repairs as needed. The main reason for the delay in the handover is the delay in the contractor's internal procedure.

3.4.3 Results of Calculations of Internal Rates of Return (Reference only)

Economic Internal Rate of Return (EIRR)

EIRR was recalculated based on the same condition as what was applied at the time of the appraisal by considering the reduction of the amount of damages in 20-year return period or smaller floods near Iloilo River and Jaro River as a benefit, considering the construction cost for the river improvement and floodway and the increase in the maintenance cost attributed to the project as costs, and assuming a project life of 50 years. The recalculated EIRR is 19.1%, which is slightly lower than 22.8% at the time of the appraisal. The main reasons are as follows: (1) Additional construction became necessary because some damages were made by the typhoon during the project implementation, which increased the construction cost; and (2) the DPWH promised to allocate 50 million peso yearly for the operation and maintenance starting from 2014, which is more than what was presumed in the EIRR calculation at the time of the appraisal (roughly 9.5 million peso).

Both project cost and project period significantly exceeded the plan. Therefore efficiency of the project is low.

3.5 Sustainability (Rating: ③)

3.5.1 Institutional Aspects of Operation and Maintenance

The institutional setup for the operation and maintenance of the project as well as roles and responsibilities are described below.

- 1) The Regional Office VI: The Maintenance Management Department of the Regional Office VI is responsible for the patrolling and inspection of the main river facilities developed by the project (Jaro floodway, riverbank protection walls, drainages, etc.) as well as for the operation and maintenance of the vehicles and heavy machinery owned by the office. On

²⁴ Mainly these are improvements of Aganan River and Tigum River.

the other hand, it is the Planning Management Department that is responsible for contracting local companies for the supervision and monitoring of the cleaning and repairs of the river facilities, dredging and disposal of soil wastes (silt, etc.).

- 2) Iloilo City Government: The office is responsible for activities related to social considerations (non-structural measures) associated with the project (managing and cleaning the promenades and MRF near the river facilities, controlling the illegal settlers near the facilities, etc.).
- 3) Pavia Municipality: The office will be responsible for the maintenance of the drainage facilities constructed by the project, for the maintenance of the access roads along Tigum and Aganan Rivers as well as for the cutting of trees near the river facilities²⁵.

There are eight staff members at the Maintenance Management Department of the Regional Office VI. According to the Regional Office VI, the staffing level is sufficient to conduct the patrolling/inspection of the river facilities. There are three staff members who supervise and monitor local companies contracted for the maintenance works; and according to them there is no problem in terms of the institutional aspects.

At the time of the appraisal of the project, it was expected that Iloilo City Government would also be responsible for maintaining the improved river facilities after completion. However, as described in 2) above, the city government is only conducting activities related to social considerations (non-structural measures) at the time of ex-post evaluation²⁶. Given such a situation, the Regional Office VI would be mainly responsible for the maintenance of the improved river facilities, according to DPWH headquarters and the Regional Office VI.

In addition, it is expected that Pavia Municipality will be responsible for the maintenance of drainage facilities and access roads. However, as discussed above in “3.4.2.2 Project Period” under Efficiency, the facilities have not been handed over by the contractor of Contract Package I to DPWH. Therefore, no actual work has been done though the municipality has the intention of taking charge of the maintenance work²⁷. Until the facilities are handed over, the contractor is responsible for maintaining the river facilities in the areas under this package.

As discussed above, the operation and maintenance of the project is being carried out

²⁵ As it will be discussed below, it is expected to begin after the handover of the facilities under Contract Package I.

²⁶ At the time of ex-post evaluation, DPWH signed a Minutes of Agreement (MOA) with the city government, which said that the city government would only be in charge of the matters related to social considerations (non-structural measures) for the time being. It was not possible to obtain details on staff assignment.

²⁷ DPWH and Pavia Municipality plan to sign a MOA concerning maintenance work following the completion of the handover. The number of maintenance staff at Pavia Municipality is not known at this point because the maintenance work is expected to begin in the future (as it will also be explained below).

differently from what was initially expected at the time of the project appraisal in that Iloilo City Government is only conducting activities related to social considerations (non-structural measures) for the time being. Nevertheless, the Regional Office VI is taking the initiative in maintaining the facilities for the meantime, and there are no concerns about the institutional aspects. On the other hand, Pavia Municipality intends to duly conduct the maintenance work once Contract Package I is handed over²⁸. Therefore, it can be presumed that there are no major concerns about the institutional aspects of the operation and maintenance of the project.

3.5.2 Technical Aspects of Operation and Maintenance

Similarly to the above-mentioned institutional aspects, the technical aspects of the operation and maintenance were evaluated by reviewing the works of the Regional Office VI. The staff members of the Maintenance Management Department have sufficient work experience and long years of service. When staff is newly recruited, On-the-Job Training (OJT) is provided for 2-3 months. Newly recruited staff members were briefed by the contractors and learned how to use equipment/machines such as heavy machinery during the project implementation. In addition, companies contracted for the removal of soil wastes (e.g., silt) have sufficient technical standards because their technical standards are evaluated during the competitive tendering process. The Planning and Design Department, which supervises and monitors contractors, have staff with ample work experience. Judging from the above facts, there are no major concerns about the technical aspects of the operation and maintenance of the Regional Office VI, an office currently responsible for the operation and maintenance.

According to the interview with Pavia Municipal Government, which will be responsible for the maintenance of the facilities after the handover of the above-mentioned Contract Package I, they commented, “We do not have any concrete operational and maintenance implementation plan because we are still waiting for the handover of Contract Package I facilities; therefore, we cannot plan for staff assignment or training at this point. However, once the handover is completed, we will plan and implement training for staff members.” Additionally, it was observed through interviews that the management and staff members of the municipality were fully aware of the importance of the maintenance work and they have knowledge and abilities to carry out the required tasks.

3.5.3 Financial Aspects of Operation and Maintenance

²⁸ It is anticipated that Pavia Municipality may encounter some challenges in carrying out the maintenance work at the initial stage. It is thought necessary that the Regional Office VI share the knowledge and experience, thereby follow up on their work as needed for some period of time.

Table 6 shows the operation and maintenance budget of the Regional Office VI concerning the project. It has been allocated since 2013. This is because one of the contractors, China International Water & Electric Corporation, was responsible for repairing the facilities from 2011 to 2012 (guarantee period), while the main construction work of Contract Package II²⁹ was completed in 2010. The 6th Regional Office thus began allocating the operation and maintenance budget and started their work in 2013. On the other hand, concerning Contract Package I, the facilities have not been handed over as discussed earlier; thus the contractor remains responsible for the management and repairs of the improved river facilities at the time of ex-post evaluation³⁰. According to the interviews with DPWH headquarters, they commented, “The current budget, 50 million peso, is sufficient. On the other hand, we plan to continue allocating sufficient operation and maintenance budget in the future. We will at least allocate the same amount as the previous year in 2015 onward. Additionally, we are providing 150 million peso for the improvement of the river facilities (outside the project area) apart from the regular budget in 2014.” Therefore, it can be said that there are no concerns about the budget allocation in terms of its amount or timing³¹.

Table 6: Operation and Maintenance Budget for the Project

	2011	2012	2013	2014
Operation and Maintenance Budget	N/A	N/A	10 million	50 million

Source: Answers to the questionnaire

3.5.4 Current Status of Operation and Maintenance

At the time of ex-post evaluation, there are no problems with the status of the operation and maintenance carried out by the Regional Office VI and the contracted companies. The 6th Regional Office develops the operation and maintenance plan, and the operation and maintenance works are carried out based on the plan³². As a periodic maintenance, the Regional Office VI uses speed boats to monitor Jaro floodway on a monthly basis, based on

²⁹ Mainly these are improvement works for Iloilo River and Jaro floodway.

³⁰ Thus the operation and maintenance budget shown in Table 5 corresponds to the improvement of Iloilo River and construction of Jaro floodway.

³¹ According to the interviews with Pavia Municipality which will maintain the river facilities after the handover of Contract Package I, they commented, “We will immediately secure and allocate operation and maintenance budget including training budget following the completion of the handover.” Based on such a comment, it can be presumed that there are no major concerns about operation and maintenance budget of the municipal government.

³² There is no fuel or spare parts shortage concerning the vehicles and heavy machinery owned by the Maintenance Management Department of the 6th Regional Office. The heavy machinery is supposed to be inspected every 250 used hours, and in case there is any problem it will be addressed immediately. From the interviews it was observed that they had sufficient technical skills within the organization.

which the contracted company will do the repairs as needed. The cleaning of the riverbank protection concrete walls and river facilities, the removal of soil wastes (silt) and the cutting of trees around the rivers are being conducted periodically. Through the field study and interviews, no problems were observed in the status of the operation and maintenance.

No major problems have been observed in the institutional, technical and financial aspects of the operation and maintenance system. Therefore sustainability of the project effect is high.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The project implemented river improvement works (Iloilo River, Jaro River, Aganan River, Tigum River and Upper Incore Creek) in Iloilo City and Pavia Municipality, Panay, Visayas, in the central Philippines, with the aim of mitigating flood disasters. At the time of the appraisal and ex-post evaluation, the project is consistent with the country's development policy concerning flood control and disaster mitigation. It is also consistent with development needs such as flood control infrastructure development. Thus, the relevance of the project is high. With river improvement works implemented through the project, initial targets were achieved in terms of discharge capacity and it became possible to respond to a 20-year return period flood. Since the completion of the project, no water overflow or flood has occurred due to heavy rain or typhoons, with no financial damage or damage to households. In addition, according to beneficiary survey results, improvements have been observed in terms of health, sanitation and living environment as a result of the reduction in flood disasters. Thus, the effectiveness and impact of the project is high. However, the project costs and project period significantly exceeded the project's initial plan; thus, efficiency is low. On the other hand, no major problems have been observed in terms of the institutional, technical and financial aspects of the operation and maintenance carried out by the executing agency; thus, project sustainability is high.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

- At the time of ex-post evaluation, the Regional Office VI was not measuring data concerning maximum water levels during heavy rains and typhoons. As the data regarding maximum water levels during floods is essential for the analysis of project effects and

proper river management, it is recommended that an institutional system be established as soon as possible so that such data collection can be measured.

- At the time of ex-post evaluation, according to DPWH, the handover of Contract Package I of the project had not been completed due to the prolonged internal process of the contractor. While DPWH headquarters and the Regional Office VI had already requested the contractor to expedite the process, it is recommended that they continue pressing for prompt completion so that Pavia Municipality can commence operation and maintenance works as soon as possible.

4.2.2 Recommendations to JICA

- Concerning the facilities under Contract Package I, it is recommended that the JICA Philippines Office also follow the status through DPWH, monitor progress following the handover and pay attention to the institutional aspects of the operation and its maintenance. In case there are any concerns, it is recommended that JICA communicate with the Regional Office VI and Pavia Municipality as needed.

4.3 Lessons Learned

- The necessity to clarify and document concrete maintenance responsibilities based on the initial agreement on the institutional arrangement for maintenance

At the time of the appraisal, Iloilo City Government had agreed to take charge of operation and maintenance following the project's completion. In reality, however, the city government is only conducting activities related to social considerations (non-structural measures). The 6th Regional Office and JICA regularly communicated with the city government during project implementation, checking whether the city government continued its intention of standing by the agreement and discussing issues related to the institutional aspects of the operation and maintenance, such as the division of responsibility, the ratio of budget to be borne and staff assignment among the organizations involved. However, it would have been worth clarifying the demarcation of roles among the Executing Agency and the related agencies such as LGUs, at the time of the project formation before the appraisal, including the practical and specific maintenance works and required budget, and documenting the agreement with its effectiveness and continuity, in order to ensure that the vision concerning the maintenance system was being concretely shared following the project's completion, in addition to simply relying on the fact that these aspects had previously been agreed upon. After that, it would have been worth

checking and sharing the status among the related agencies periodically.

Comparison of the Original and Actual Scope of the Project

Item	Original	Actual
1. Project Outputs	<p>【Iloilo Flood Control Project (I)】 ■ Consulting service for the detailed design (detailed design, preparation of tender documents, a river environment improvement study and others: 193MM in total: 93MM for international consultants, 100MM for local consultants) and the cost related to the development of relocation sites</p> <p>【Iloilo Flood Control Project (II)】 1) Civil Works a) River Improvement Aganan River improvement: 3.9km Tigum River improvement: 2.0km Improvement of upper Jaro River: 1.0km Improvement of the mouth of Jaro River: 5.6km Improvement of midstream of Iloilo River: 4.2km Improvement of upper Ingore creek: 3.0km & associated bridge construction: 3 bridges</p> <p>b) Construction of Floodway Construction of Jaro floodway: 4.8km / associated bridge construction: 3 bridges</p> <p>c) Development of Relocation Sites Development of relocation sites for the residents subject to resettlement: 22.5ha (So-oc: 2.5ha, San Isidro: 20ha)</p> <p>2) Consulting Service ■ Component 1 (Main Tasks) a) Support for the procurement; b) Construction management; c) Operation and maintenance training for DPWH and Iloilo City Government staffs; and d) Environment management (impacts on water quality, noise, air and natural environment, environmental</p>	<p>【Iloilo Flood Control Project (I)】 ■ The consulting service for the detailed design was provided as planned. (305.48MM in total: 80.75MM for the international consultants, 224.73MM for the local consultants.) As for the development of the relocation sites, 2.6ha of land was developed in Buntatala, Iloilo City.</p> <p>【Iloilo Flood Control Project (II)】 1) Civil Works a) River Improvement Aganan River improvement: 4.26km Tigum River improvement: as planned Improvement of upper Jaro River: as planned Improvement of the mouth of Jaro River: as planned Improvement of midstream of Iloilo River: 3.8km Improvement of upper Ingore creek: as planned & associated bridge construction: as planned</p> <p>b) Construction of Floodway Construction of Jaro floodway: as planned / associated bridge construction: 4 bridges</p> <p>c) Development of Relocation Sites Development of relocation sites for the residents subject to resettlement: 1.8ha (1.8ha was developed in So-oc only as the planned 20ha in San Isidro was canceled)</p> <p>2) Consulting Service ■ Component 1 (Main Tasks) Mostly implemented as planned. (However, the actual workload was more than planned because the construction expanded in scale.)</p>

	<p>monitoring on excavated sediment, and support for the development and implementation of the mangrove reforestation plan, etc.) (Planned MM) 458MM (international: 171MM, local: 287MM)</p> <p>■ Component 2 (Main Tasks) e) Support for the resettlement measures (including assisting the resettlement procedures, assisting the land acquisition and compensation process, assisting the monitoring to prevent resettled residents from returning to the project sites, assisting the development of livelihoods improvement program); f) Support for the advocacy works targeted at local residents (campaigns to explain the benefits of rivers to the life of the citizens, the importance of flood management, prevention of illegal waste disposal, prevention of riverside occupation by illegal settlers and maintenance of the river facilities, etc.); g) Studies on the sediment in upper Iloilo River and Jaro River and the current situation of the forest; and h) Review of the waste disposal plan of Iloilo City (Planned MM) 393MM (international: 63MM, local: 330MM)</p>	<p>(Actual MM) <u>610.34MM</u> (international: 188.81, local: 421.53MM)</p> <p>■ Component 2 (Main Tasks) The tasks listed on the left-hand column were carried out mostly as planned. (However, the task e) was scaled back.)</p> <p>(Actual MM) 308.45MM (international: 72.26MM, local: 236.19MM)</p> <p>【Additional Output】 a) Repair work after the super typhoon in 2008 and the construction of concrete riverbank protection walls; b) 14 MRF were added (= 17 MRF in total)</p>
2. Project Period	75 months	162 months
3. Project Cost		
Amount paid in Foreign currency	4,056 million yen	6,800 million yen
Amount paid in Local currency	6,392 million yen	6,041 million yen

Total	10,448 million yen	12,841 million yen
Japanese ODA loan portion	7,248 million yen	7,068 million yen
Exchange rate	Phase I: 1PHP = 4.0 yen (September 1998), Phase II: 1PHP = 2.3 yen (March 2002)	Phase I: 1PHP = 2.62 yen (average rate for the project period from September 1998 to December 2001), Phase II: 1PHP = 2.12 yen (average rate for the project period from March 2002 to April 2012)