Republic of the Philippines

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

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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 bridges[1] 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	【Main Construction】 Interest Rate: 2.2%, 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 Tide
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.	・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	Japanese ODA Loan (Loan Agreement signing year and month in parentheses) ・Rural Road Network Development Project (I) (July, 1991)

	・Rural Road Network Development Project (II) (August, 1995) ・Urgent Bridges Construction Project for Rural Development (March, 2002) ・Road Upgrading and Preservation Project (March, 2011) Technical Cooperation ・Improvement of Quality Management for Highway and Bridge Construction and Maintenance (Phase I: February, 2007 - February 2010, Phase II: October, 2011 - September, 2014) Grant Aid ・Project for Constructing Bridges Along Rural Roads (Exchange of Notes signing year and month in parentheses) Phase 1 (April, 1988) Phase 2 (October, 1988) Phase 3 (April, 1990 and February, 1992) Phase 4 (January, 1993 and July, 1993) World Bank ・National Roads Improvement and Management Program Phase 2 (NRIMP 2) Asian Development Bank ・Road Improvement and Institutional Development Project

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: C[2])

3.1 Relevance (Rating: ③[3])

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 links[4]

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 Effectiveness[5] (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 appraisal[6], 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.Prosperidad-Lianga Road / Agusan del Sur and Surigao del Sur (Nov.2010)	517	746	1,097	2,163	2,394	2,649

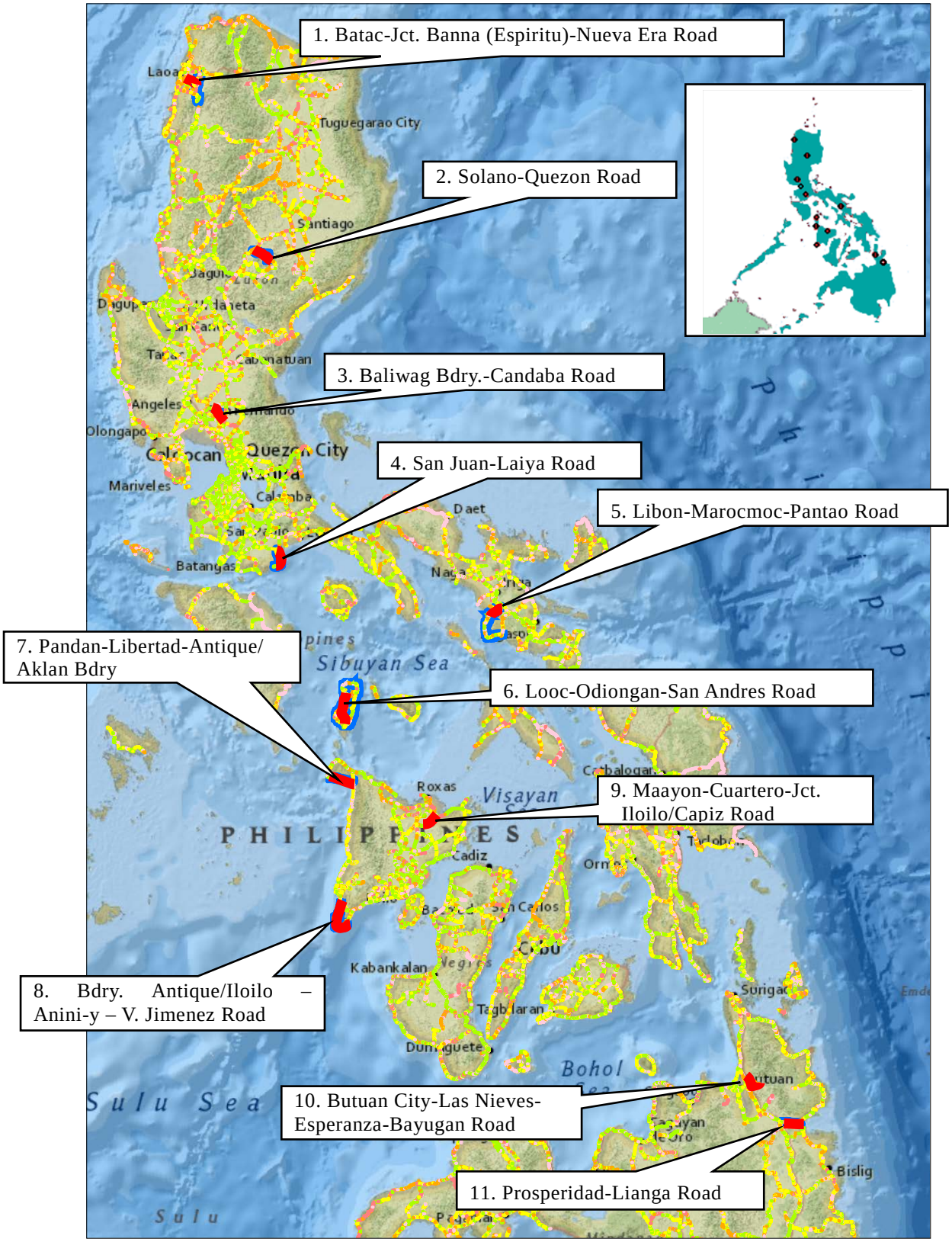
Source: DPWH Planning Section

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 survey[8][9] 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?	・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.)	・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 government[10], 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 study[11], 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?	・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.)	・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?	・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.)	・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)＞	
・From Libertad to Pandan proper (distance for about 28km) ・From Libertad to Pandan Hospital ・From Libertad to Pandan Port	・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)＞	
・From Casay, Anini-y to San Jose proper (distance for about 50km)	・135 minutes (do) to 95 minutes (do)
・From Casay, Anini-y to San Jose Hospital	・135 minutes (do) to 95 minutes (do)
・From Casay, Anini-y to San Jose Airport	・140 minutes (do) to 100 minutes (do)
Interview with Local Residents Living Along Bdry. Antique/Iloilo – Anini-y – V. Jimenez Road (Antique Province)	
・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)	
・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?	・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.)	・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?	・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.)	・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?	・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.)	・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)＞	
・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	・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)	
・Travel time to Poblacion where collection point for major agricultural crops, palay and corn, is located has shortened from 90 minutes to 60 munities, 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?	・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).

	・Others: 0%　(no resident) ・No idea: 0%　(no resident)

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?	・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.)	・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.Prosperidad-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.Prosperidad-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 bridges[15] 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 2deleted 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 GOP[16] 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.Prosperidad-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.Prosperidad-Lianga Road / Agusan del Sur and Surigao del Sur	DPWH Region XIII	＜Agusan del Sur Fist 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, thee 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 introduced[24], 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 types[25] 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 2014[27] 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: DPWM 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 offices[28] 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 maintenance[30] (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/Aklan 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.Prosperidad-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.

VOCS=〔AADT×BVOCd (peso/(km・vehicle))×distance of the road section (km)×365〕+〔AADT×BVOCt (peso/(minute・vehicle))×travel time of the road section (minute)×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	1) Civil Engineering Work 1.Batac-Jct. Banna (Espiritu)-Nueva Era Road: Road (12.19km) 2. Solano-Quezon Road: Road (8.15km), Bridge (3) 3. Baliwag Bdry.-Candaba Road: Road (5.55km), Bridge (1) 4.San Juan-Laiya Road: Road (9.80km), Bridge (4) 5. Libon-Marocmoc-Pantao Road: Road (16.45km), Bridge (3) 6.Looc-Odiongan-San Andres Road: Road (37.26km) 7.Pandan-Libertad-Antique/Aklan Bdry: Road (27.10km), Bridge (13) 8.Maayon-Cuartero-Jct. Iloilo/Capiz Road: Road (41.35km), Bridge (1) 9.Butuan City-Las Nieves-Esperanza-Bayugan Road: Road (59.26km), Bridge (2) 10.Prosperidad-Lianga Road: Road (21.15km), Bridge (2) 2) 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	1) Civil Engineering Work 1.Batac-Jct. Banna (Espiritu)-Nueva Era Road: Road (12.21km) 2. Solano-Quezon Road: Road (8.15km), Bridge (1) 3. Baliwag Bdry.-Candaba Road: Road (2.10km), Bridge (0) 4.San Juan-Laiya Road: Road (23.10km), Bridge (1) 5. Libon-Marocmoc-Pantao Road: Road (16.45km), Bridge (0) 6.Looc-Odiongan-San Andres Road: Road (37.26km), Bridge (6) 7.Pandan-Libertad-Antique/Aklan Bdry: Road (27.76km), Bridge (12) 8.Bdry. Antique/Iloilo – Anini-y – V. Jimenez Road: Road (29.95km), Bridge (5) 9.Maayon-Cuartero-Jct. Iloilo/Capiz Road: Road (41.45km), Bridge (1) 10.Butuan City-Las Nieves-Esperanza-Bayugan Road: Road (59.26km), Bridge (4) 11.Prosperidad-Lianga Road: Road (21.15km), Bridge (2) 2) Consulting Services 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.
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]