

Republic of the Philippines

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

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

0. Summary

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

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

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

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

1. Project Description



Project Location

(Total of 137 Bridges Nationwide)



Culasi Bridge

(Panay Island, Iloilo Province)

1.1 Background

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

1.2 Project Outline

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

country, thereby contributing to the development of regional economies.

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

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

2. Outline of the Evaluation Study

2.1 External Evaluator

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

2.2 Duration of Evaluation Study

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

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

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

3.1 Relevance (Rating: ③⁴)

3.1.1 Relevance to the Development Plan of the Philippines

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

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

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

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

3.1.2 Relevance to the Development Needs of the Philippines

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

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

⁴ ③: High, ②: Fair, ①: Low

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

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

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

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

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

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

3.1.3 Relevance to Japan’s ODA Policy

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

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

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

3.2 Effectiveness⁸ (Rating: ③)

3.2.1 Quantitative Effects (Operation and Effect Indicators)

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

Table 1: Status of 10 Sample Bridges (Actual)

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

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

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

¹⁰ Government of the Philippines

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

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

3.2.1.1 Annual Average Daily Traffic (vehicle/day)

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

Table 2: Annual Average Daily Traffic (AADT)

(Unit: vehicle/day)

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

Source: DPWH Project Management Office

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

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

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

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

(Unit: day)

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

Source: DPWH Project Management Office

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

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

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

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

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

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

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

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

(Unit: km)

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

Source: DPWH Project Management Office

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

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

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

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

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

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

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

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



Before

1. Bangcag Bridge (CAR)



After



Before

2. Amburayan Bridge (Region I)



After



Before

4. Quirino Bridge (Region I)



After



Before



After

6. Payapa Bridge (Region IV-A)



Before



After

7. Rangas3 Bridge (Region V)

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

3.2.2 Qualitative Effects

3.2.2.1 Improvement of Traffic Safety and Accessibility of Bridges

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

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

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

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

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

Source: Results from the beneficiary survey

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

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

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

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

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

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

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

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

Source: Results from the beneficiary survey

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

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

Source: Results from the beneficiary survey

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

project.

3.2.2.2 Improved Market Access

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

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

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

Source: Results from the beneficiary survey

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

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

Source: Results from the beneficiary survey

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

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

Source: Results from the beneficiary survey

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

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

3.3 Impact

3.3.1 Intended Impacts

3.3.1.1 Contribution to Activation of Local Economic Activities

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

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

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

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

Source: Results from the beneficiary survey

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

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

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

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

(上記脚注と重なっている)

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

3.3.1.2 Effects on Poverty Reduction

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

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

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

Source: Results from the beneficiary survey

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

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

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

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

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

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

3.3.1.3 Impacts on Local Farmers’ Living Standards

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

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

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

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

Source: Results from the beneficiary survey

3.3.2 Other Impacts

3.3.2.1 Impacts on the Natural Environment

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

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

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

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

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

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

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

3.3.2.2 Land Acquisition and Resettlement

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

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

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

Table 15: Results of Land Acquisition

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

Source: Results from questionnaire survey of executing agency

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

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

3.4 Efficiency (Rating: ①)

3.4.1 Project Outputs

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

Table 16: Comparison of Planned and Actual Project Outputs

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

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

Source: Results from questionnaire survey of executing agency

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

to 137.

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

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

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

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

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

< Major Changes of Outputs and their Reasons >

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

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

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

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

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

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

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

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

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

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

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

3.4.2 Project Inputs

3.4.2.1 Project Cost

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

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

3.4.2.2 Project Period

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

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

Table 18 shows comparisons of planned and actual project period.

Table 18: Comparison of Planned and Actual Project Period

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

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

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

6. Consulting services	Jan. 2003 – Jul. 2007 (55 months)	Jun. 2003 – on-going (to be completed by the end of 2014)
------------------------	-----------------------------------	--

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

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

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

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

Table 19: Assumption and Results of EIRR Recalculation

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

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

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

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

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

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

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

3.5 Sustainability (Rating: ②)

3.5.1 Institutional Aspects of Operation and Maintenance

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

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

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

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

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

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

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

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



Road Maintenance Crew

3.5.2 Technical Aspects of Operation and Maintenance

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

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

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

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

3.5.3 Financial Aspects of Operation and Maintenance

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

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

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

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

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

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

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

Operation and maintenance cost = Basic Cost × EMK

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

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

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

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

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

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

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

Table 20: DPWH Road Maintenance Budget (Actual Allocation)

(Unit: 1,000 peso)

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

Source: DPWH BOM

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

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

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

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

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

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

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

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

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

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

3.5.4 Current Status of Operation and Maintenance

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

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

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

road sector asset management system.)

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

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



Bongalonan Bridge

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

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

Column: DPWH's Road Sector Asset Management System

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

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

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

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

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

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

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

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

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

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

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

- Importance of timely budget release from DPWH headquarters to DEOs

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

4.3 Lessons Learned

- Importance of institutionalizing advance procurement system

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

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

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

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

< Data on Agricultural Production >

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

(Unit: ton)

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

Source: Bureau of Agricultural Statistics

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

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

(Unit: ton)

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

Source: Bureau of Agricultural Statistics

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

< Data on Business Activities >

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

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

Source: National Statistics Office

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

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

< Data on Ratio of Poor Household >

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

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

Source: Philippine National Statistical Coordination Board

Comparison of the Original and Actual Scope of the Project

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

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

[END]