

Kingdom of Cambodia

FY2017 Ex-Post Evaluation of Japanese Grant Aid Project
“The Project for Flood Disaster Rehabilitation and Mitigation”

External Evaluator: Koichi Akimoto, OPMAC Corporation

0. Summary

The objective of this project was to restore the function of road infrastructure in the disaster area to its pre-disaster condition by rehabilitation and improvement of roads, the drainage system and the national road No. 5 in Kampong Chhnang City and reconstructing 8 decaying bridges on the national road No. 11 in Prey Veng Province, all of which were affected by the flood in 2011, thereby contributing to the mitigation of flood damage and smoother regional transport in the affected areas. The project was consistent with the development plan and development needs of Cambodia, as well as with Japan’s ODA policy. Therefore, the project relevance is high. Meanwhile, the project cost and project period were in accordance with the plan. Therefore, the efficiency of the project is high. As for the project effects, it was confirmed that the project brought positive effects in an increase in traffic volume in the project areas, in a decrease in the maintenance costs of the Kampong Chhnang Department of Public Works and Transport (hereinafter called DPWT) for the project drainage system, in a decrease in the maintenance costs of the Prey Veng DPWT for project bridges, and in a reduction in travel time from BR-1 bridge to BR-18 bridge on the national road No. 11. Improvements in traffic safety and traffic accessibility in the project areas were also observed. In addition, it is considered that there has been a mitigation of flood damage in the project areas, improvements in the hygienic and living environments and improvements in logistics on the national roads No. 5 and No. 11. It is found that these improvements are thanks to the contribution of the project and therefore the effectiveness and impacts of the project are high. The sustainability of project effects is fair since no major problems have been observed in the institutional and technical aspect as well as status of operation and maintenance for the project, but some minor problems have been observed in terms of the financial aspect, due to insufficient budget allocation for periodic maintenance.

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

1. Project Description



Project Locations



Vehicles passing over the national Road No. 5 after improvement.

1.1 Background

Since Cambodia is located downstream on the Mekong River in the Indochina Peninsula and as most of the country is lowland areas, it has one of the highest proportions of flood risk and mortality by flood in the world. The seasonal variation in the water level of the Mekong River has escalated in combination with recent climate change and droughts and floods occur repeatedly every year. During the rainy season of 2011, it rained more than usual in Cambodia and upstream of the Mekong River. Although there was no serious flood disaster in Phnom Penh due to the support including the previous Japan's assistance, there was widespread damage through floods in surrounding areas, and it was reported that over 250 people were lost. One and a half million people suffered damage and 17 percent of paddy fields in the country was damaged, while infrastructure such as roads and bridges also suffered damage. In this situation, the government of Cambodia requested grant aid for rehabilitation and the mitigation of flood disaster from the government of Japan.

Most of Kampong Chhnang city, including the national road No. 5, was flooded for over a month during the flood of 2011. Since the road pavement was a simple asphalt surface paving, most of the roads in the center of the city were seriously damaged. It was also necessary to set up a proper road drainage system as the roads were flooded due to a lack of road drainage facilities in the city. In addition, there were 14 decaying temporary bridges on the national road No. 11, and there were safety concerns because of erosion around the abutments for the bridges, on access roads, and the riverbed during the flood of 2011. Additionally, it was urgently necessary to reconstruct the temporary bridges since they had only one lane and load restrictions, also vehicles required to drive slowly etc. It was planned that assistance from their own funds and Asian Development Bank (ADB) would reconstruct 6 bridges out of the 14 bridges, but there was no reconstruction plan for the remaining 8 bridges.

1.2 Project Outline

To restore the function of road infrastructure in the disaster area to its pre-disaster condition by improving roads, the drainage system and the national road No. 5 in Kampong Chhnang City and reconstructing the bridges on the national road No. 11 which were affected by the flood of 2011, thereby contributing to the mitigation of flood damage and smoother regional transport in the affected areas.¹

Grant Limit / Actual Grant Amount	1,510 million yen / 1,285 million yen
Exchange of Notes Date / Grant Agreement Date	April 2012 / July 2012
Executing Agency	Ministry of Public Works and Transport (herein after called MPWT)
Project Completion	January 2015
Main Contractor	Hazama Ando Corporation (Initially, Hazama Corporation)
Main Consultant	Katahira & Engineers International
Basic Design	January 2012 – August 2012
Related Projects	<p><u>Technical Cooperation</u></p> <ul style="list-style-type: none"> • The Project for Strengthening Capacity for Maintenance of Roads and Bridges (2015 – 2018) <p><u>ODA Loan</u></p> <ul style="list-style-type: none"> • National Road No. 5 Improvement Project (Prek Kdam-Thlea Ma'am Section) (1) (2014 – 2021) <p><u>Grant Aid</u></p> <ul style="list-style-type: none"> • The Project for Flood Protection and Drainage Improvement in the Municipality of Phnom Penh (I – III) (2001 – 2011) • The Project for Urgent Replacement of Bridges in Flood-Prone Areas (2017 – 2020) <p><u>Other International Agencies and Donors</u></p> <ul style="list-style-type: none"> • ADB: Flood Damage Emergency Reconstruction Project (2012 – 2015)

¹ The project objectives at the ex-ante evaluation sheet were expressed as “To restore and improve roads and drainage system in Kampong Chhnang City and the bridges on the national road No. 11 which were affected by the flood of 2011. Thereby contributing to the mitigation of flood damage.” However, this was not based on the logic model (Output → Outcome → Impact). Thus, the evaluator rearranged the project objectives at the ex-post evaluation stage. Even though the Output remains the same as at the ex-ante evaluation sheet: “improving roads and drainage system and reconstructing the bridges”, it complemented the Outcome (to restore the function of road infrastructure) which was not described clearly at the ex-ante evaluation sheet. As for the Impacts, in addition to “the mitigation of flood damage” at the ex-ante evaluation sheet, traffic effect was added (“smoother regional transport”).

2. Outline of the Evaluation Study

2.1 External Evaluator

Koichi Akimoto, OPMAC Corporation

2.2 Duration of Evaluation Study

This ex-post evaluation study was conducted with the following schedule.

Duration of the Study: August 2017 - August 2018

Duration of the Field Study: November 26 - December 8, 2017 - March 18 - 23, 2018

2.3 Constraints during the Evaluation Study

While the project was implemented for the improvement of roads and drainage system and the reconstruction of bridges, other donors also implemented road improvement / reconstruction projects in parallel with the project for national roads and outer roads which are connected to the project facilities. Therefore, it is considered that these projects also made a certain level of contribution that was reflected in the effectiveness and impacts of this project. For that reason, at ex-post evaluation, it was difficult to separate the direct effects of the project and the contribution (external factors) of the other donors' projects. Therefore, although there is no specific indication later in this report, the effectiveness and impacts confirmed at the ex-post evaluation were achieved both by the project and by the road improvement / reconstruction projects of other donors. In addition to this, although beneficiary interviews were implemented to examine the qualitative effects of the project, the number of interviewees was limited due to the length of the field study period. Thus, the possibility remains that there is opinion bias among the interviewees in respect of the qualitative effects which was not possible to exclude completely in spite of having interviews in various places.

3. Results of the Evaluation (Overall Rating: A²)

3.1 Relevance (Rating: ③³)

3.1.1 Consistency with the Development Plan of Cambodia

At the time of planning, the *National Strategic Development Plan* (2009-2013) based on the *Rectangular Strategy* (2004), the highest national development strategy in Cambodia, had been published in June 2010. This stated that the improvement and development of infrastructure was one of the 4 side strategies for promoting growth. It also indicated that the improvement and development of transport infrastructure was a priority area in the strategy. Also, the *Rectangular Strategy Phase II* (2008) referred to disaster and flood prevention in terms of water resource management, agriculture and infrastructure development etc.

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

³ ③: High, ②: Fair, ①: Low

At the time of the ex-post evaluation, the *Rectangular Strategy Phase III* (2013) included the development of hard infrastructure (including the formulation of master plans for city infrastructure development) as one of the implementation guidelines for activating economic activity to aim at average annual economic growth rate at 7%. The *National Strategic Development Plan* (2014-2018) also stated that infrastructure development was a priority policy action, and one priority area mentioned was the expansion of newly paved roads by 300km to 400km every year in both urban and rural areas of Cambodia. In addition, the improvement and development of transport infrastructure (especially roads) were addressed as a priority area, particularly the high standardization (pavement surface, width extension, drainage maintenance) of 1 digit national roads as a policy target.

Thus, the national development plans of Cambodia both at the time of planning and ex-post evaluation prioritized the improvement and development of road infrastructure. The project was therefore consistent with the development plan of Cambodia.

3.1.2 Consistency with the Development Needs of Cambodia

At the time of planning, as indicated in “1.1 Background”, since the pavements of roads were simple asphalt surface paving in Kampong Chhnang city, most of the city roads were seriously damaged in the flood of 2011, including the national road No. 5. Furthermore, the roads were flooded for over a month due to a lack of road drainage facilities in the city. Meanwhile, there were safety concerns for the 8 bridges on the national road No. 11 because of erosion around the abutments of bridges, on access roads, and the riverbed due to the flood of 2011. According to the *Study on the Road Network Development in the Kingdom of Cambodia* (2006), the proportions of land and marine freight transport in Cambodia were specified as approximately 70% for road, 20% for river and 10% for railway. Although the improvement of 1 digit national roads had mostly been completed except for the part of a section, the improvement of 2 digit roads, which largely contribute to a number of the country’s administrative services and to economic and social activities in rural areas, had been delayed. Also, 90% of all bridges in Cambodia were temporary bridges, and their level of maintenance was very low.

At the time of the ex-post evaluation, since road transport was the main methods of transportation in Cambodia, the development of the road transport infrastructure was continuously put a high priority, as mentioned in the above national development plan. Also, roads and bridges improved by this project were located on the national road No. 5, which is the part of Asian Highway Network from Phnom Penh to Bangkok, and on the national road No. 11 which is a feeder road of the Asian Highway Network (national road No. 1). Thus, it has an important role on the road network system of Cambodia as to improve logistics and ensure traffic safety for the national road in the country. Meanwhile, as Cambodia is prone to floods, it was necessary to improve the road infrastructure for the mitigation of flood damage. According to

the *Data Collection Survey on the Trunk Road Network Planning for the Strengthening of Connectivity through the Southern Economic Corridor* (2013)⁴ by the support of the Japan International Cooperation Agency (JICA), the strengthening and expansion of the road network system in Cambodia was specified as an issue in dealing with rising traffic demand nationally and internationally with the rapid economic development of Cambodia.

The role of the project facilities has continued to be important in terms of the mitigation of flood damage and road safety in the project areas, promoting logistics for Cambodia and neighboring countries. Therefore, the project was consistent with the development needs of Cambodia at the time of planning and ex-post evaluation.

3.1.3 Consistency with Japan's ODA Policy

At the time of planning, the *Japan's ODA Data for Cambodia* (2012) specified "Development of Economic Infrastructure" as one of the priority areas for assistance from the perspectives of ① To assist achievement of the development goals based on the *Rectangular Strategy*, ② To promote ASEAN integration, to strengthen ASEAN connectivity, and to narrow development gaps in the region, ③ To ensure human security and environmental sustainability. The "Development of Economic Infrastructure" was also given as one of the priority areas for strengthening the basis for economic activities. As the aim of the project was to strengthen the infrastructure facilities of Kampong Chhnang city and the national roads No. 5 and No. 11, the project fell under the focus of the above mentioned "Development of Economic Infrastructure".

Therefore, the project was consistent with one of the priority areas for Japan's ODA policy of the "*Development of Economic Infrastructure*".

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

3.2 Efficiency (Rating: ③)

3.2.1 Project Outputs

The outputs of the project for the Japan side and the Cambodia side were the planned improvements of roads, including 4.6km of the national road No. 5 in Kampong Chhnang City, improvement of 2.6km of the road drainage system in the city, the reconstruction of 8 bridges on the national road No. 11, land acquisition associated with it, the relocation of public facilities etc. These were mostly implemented according to the plan. The outputs of the project for the Japan and Cambodia sides are shown in Table 1 below.

⁴ Regarded as the survey for Road Master Plan Formulation.

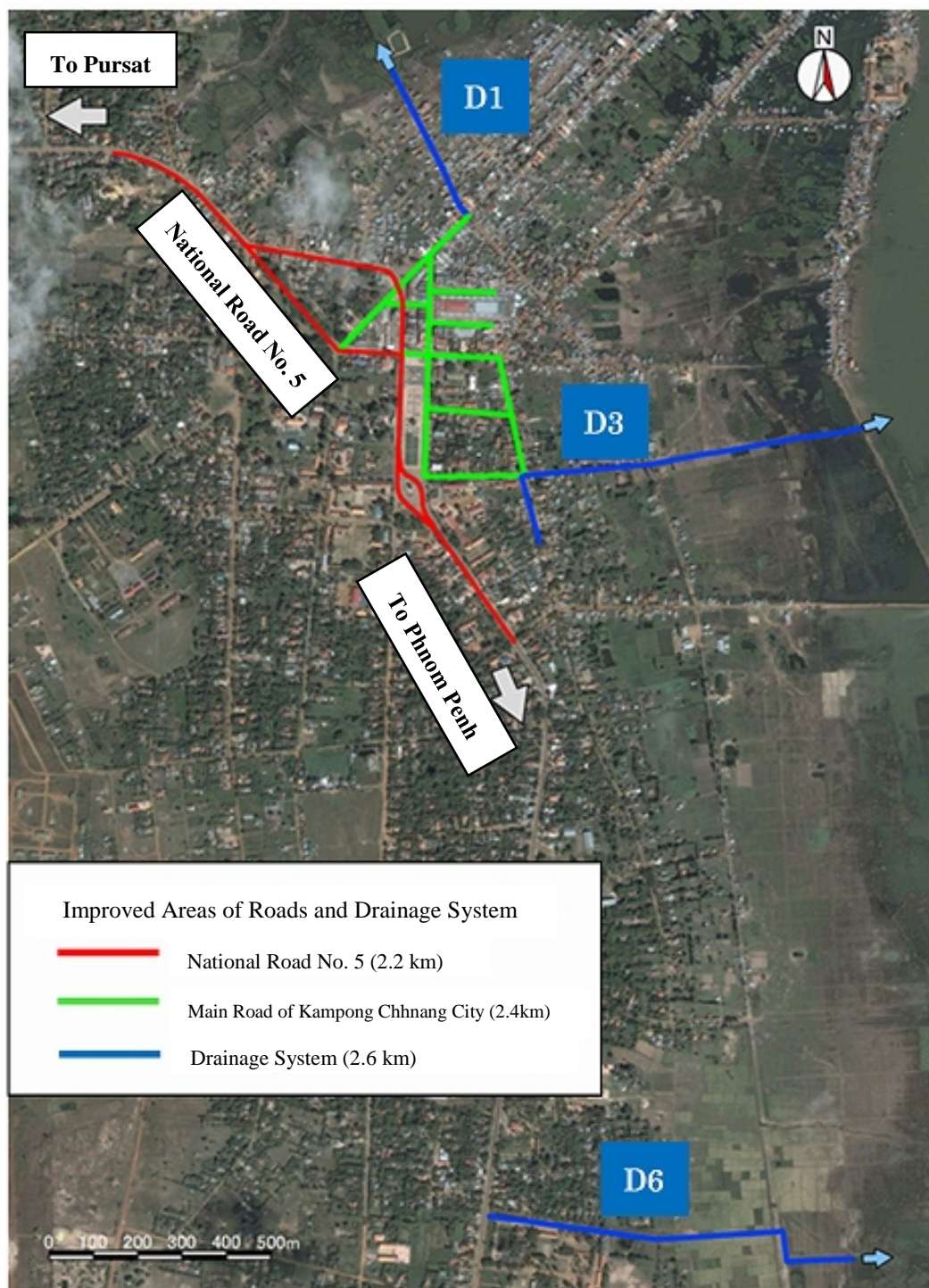
Table 1: Project Outputs (Planned / Actual)⁵

Item	Planned	Actual
[Japan side] Civil Works	<ul style="list-style-type: none"> Improving roads and the national road (NR) No. 5 for 4.6km and the road drainage system for 2.6km in Kampong Chhnang City Reconstruction of the following 8 bridges on the national road No. 11: Total 308m <ul style="list-style-type: none"> * KBAL BOEUNG Bridge (Bridge Number: BR-4) * CHHNAT Bridge (Bridge Number: BR-5) * SAM PUTHOR II Bridge (Bridge Number: BR-7) * MEBON Bridge (Bridge Number: BR-8) * THKOV Bridge (Bridge Number: BR-9) * KOK TROM Bridge (Bridge Number: Clv-1) * EK REAM Bridge (Bridge Number: BR-11) * ROM LECH Bridge (Bridge Number: Clv-2) 	<ul style="list-style-type: none"> Mostly as planned (softground of the roadbed section improved using the replacement method for 2,007m² on NR5(1) and 3,664m² on NR5(2); pavement specification of Drainage Way No. 2 changed to DBST) Mostly as planned (changed location of riverbed and changed plans for the abutment / revetment / bed protection for CHHNAT Bridge (BR-5 Bridge), and cement improvement of the accessroad beds of all 8 project bridges changed to good quality soil replacement)
[Cambodia side] Civil Works	<ul style="list-style-type: none"> Relocation of public facilities (telephone poles, electric/telephone wires / communication lines, other underground facilities) 	<ul style="list-style-type: none"> As planned
Construction of facilities and procurement for Operation & Maintenance	<ul style="list-style-type: none"> Providing work yards, material storage spaces, field offices etc. Securing borrowing pits / spoil banks / industrial waste disposal facilities 	<ul style="list-style-type: none"> As planned Not conducted due to the demand of the main contractor

Source: Documents provided by JICA and response to interview with MPWT

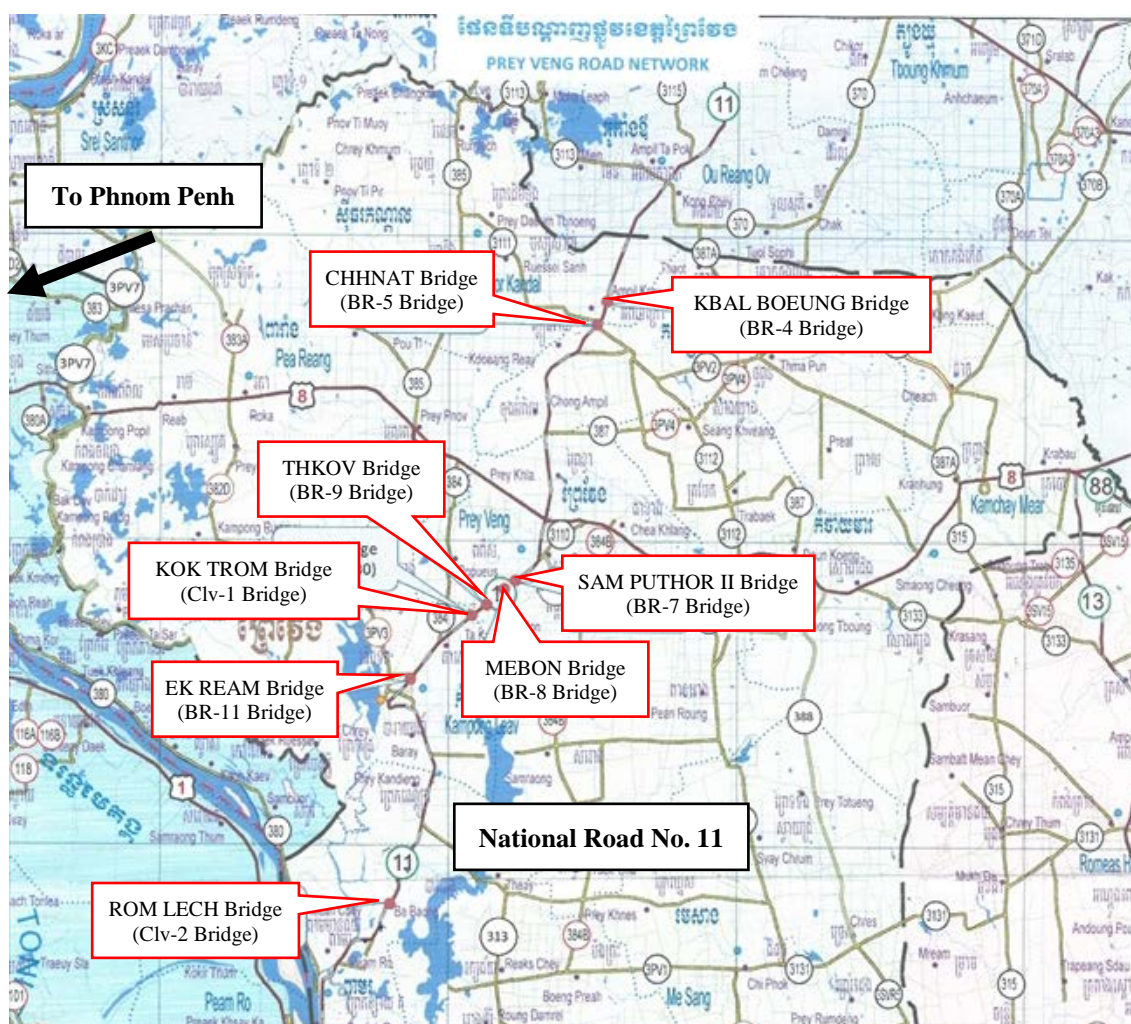
Please refer to figures 1 and 2 below for the site and location of project roads and drainage system in Kampong Chhnang City, and the 8 bridges on the national road No. 11.

⁵ In the preparatory survey report, the names of CHHNAT Bridge (Bridge Number: BR-5) and KOK TROM Bridge (Bridge Number: Clv-1) in Table 1 were SNATE Bridge and TKOV II Bridge respectively. However, each bridge name was confirmed as indicated in Table 1 by the field study and in the completion report.



Source: MPWT

Figure 1: Location Map of Project Roads and Drainage System in Kampong Chhnang City



Source: MPWT

Figure 2: Location Map of Project Bridges on the National Road No. 11

3.2.2 Project Inputs

3.2.2.1 Project Cost

The actual project cost was 1,285 million yen, which was within the planned project budget of 1,513 million yen (85% against the plan). Please refer to the breakdown of each expense for the Japan side and Cambodia side in Table 2 below.

Table 2: Planned and Actual Project Costs

Item	Planned	Actual	Compared to the plan
Japan side	1,510 million yen	1,267 million yen	84%
Cambodia side	3 million yen ^(Note 1)	18 million yen ^(Note 2)	600%
Total	1,513 million yen	1,285 million yen	85%

Source: Documents provided by JICA and documents provided by MPWT

Note 1: The exchange rate used: 1 USD = JPY 77.18 (March, 2012)

Note 2: The exchange rate used: 1 USD = JPY 108.24 (The International Monetary Fund (2017) "International Financial Statistics Year Book 2017", used the average exchange rate of the years 2012 – 2015)

The main reason for the actual project cost at Japanese side being approximately 16% lower than the planned cost was that the construction cost of the main works was lower than estimated due to competitive bidding. Also the actual project cost for the Cambodian side being 600% higher than the planned cost, was because the costs of land acquisition were higher than expected,⁶ and a private land lease fee was incurred for 63,000 USD separately.

3.2.2.2 Project Period

According to the preparatory survey report for the project, the planned project period was identified as commencing with detailed design (the contract agreement date for the Consultant), which indicated 29 months from September 2012 to January 2015. In fact, the actual project period was 29 months from September 2012 to January 2015, which was implemented as planned (a ratio against the plan of 100%).⁷

Table 3: Planned and Actual Project Period

Planned	Actual
September 2012 (Contract agreement date for Consultant) – January 2015: Total 29 months	Exchange of Notes (E/N) date: April 21 st , 2012
	Grant Agreement (G/A) date: July 30 th , 2012
	Contract agreement date for Consultant: September 11 th , 2012
	Contract agreement date for Contractor (Initially): January 18 th , 2013
	Comencement date: January 25 th , 2013
	Contract agreement date for Contractor (The first amendment; change of the name of contractor): April 15 th , 2013
	Contract agreement date for Contractor (The second amendment; change of contract amount caused by design changes): November 17 th , 2014
	Completion date: January 31 st , 2015

Source: Documents provided by JICA

Both the project cost and project period were within the plan. Therefore, efficiency of the project is high.

⁶ Though the planned cost was 1 USD/m², the actual cost was 3 USD/m², 8 USD/m², 16 USD/m² (the land acquisition cost differed according to location).

⁷ Since there was no information regarding the starting point of the planned project period in the ex-ante evaluation sheet, the operation sheet indicated in the preparatory survey report was adopted. Moreover, based on the operation sheet, the planned project period did not include the date of the Exchange of Notes and Grant Agreement, and the commencement of the project was indicated as the commencement of detailed design (contract agreement date for Consultant). Therefore, the planned • actual commencement of the project was considered as the commencement of detailed design at the time of ex-post evaluation sheet.

3.3 Effectiveness and Impacts⁸ (Rating: ③)

3.3.1 Effectiveness

3.3.1.1 Quantitative Effects (Operation and Effect Indicators)

To measure the operation and effect indicators for the quantitative effects of the project, the maintenance cost (USD/Year) of the Kampong Chhnang DPWT for project roads and the road drainage system was set, together with the periods of flooding of the road shoulder in Kampong Chhnang City. Meanwhile, for the reconstruction of the 8 bridges on the national road No.11, they were set as the maintenance cost (USD/Year) of the Prey Veng DPWT for project bridges and the travel time (BR-1 bridge to BR-18 bridge) on the national road No. 11 due to the improvement in speed of travel. On the other hand, traffic volume through improvement section by the project was not included in the Operation and Effect Indicators in the ex-ante evaluation sheet. However, since the project outcome of the road sector generally analyzes traffic volume, this was added in the Operation and Effect Indicators.⁹ The results of analysis of the operation and effect indicators are shown below.

(1) Traffic Volume around the Project Areas¹⁰

Comparing the traffic volume data of the Kampong Chhnang City areas (national road No. 5) and the Prey Veng City areas (national road No. 11) after project completion (2015), with the traffic data of vicinity areas of the project before project implementation, it can be seen that traffic volume increased after the project, although it was difficult to conduct a narrow analysis because of mismatching of the traffic measurement points (Table 4, 5, 6, and 7).¹¹

Looking at the traffic volume of the Kampong Chhnang City areas on the national road No.5, it can be seen that the total number of traffic volume before (2014) and after the project implementation (2015) remained mostly unchanged, although the volume of full trailers increased between 2.5 times to 4 times at each section. The reason for this increase was that, ① it became easier for full trailers to pass through due to the improvement of roads and the part of national road No. 5 in Kampong Chhnang City, and ② there was an improvement in logistics routes in the surrounding areas with the development of the national road No.5 (Tables 4 and 5). The national road No. 5 links Phnom Penh with Battambang province, which has Cambodia's third largest population¹². Since the national road No .5 is also part of the Asian

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

⁹ Since the main objective of the project was reconstruction, increase of traffic volume was not identified as a primary object. Thus, weight is not placed on the increase of traffic volume as an indicator for the evaluation decision. All of the operation and effect indicators (including traffic volume) are given equal weight. In addition, the increase in traffic volume from before the project is also not considered as an achievement goal for evaluation decision.

¹⁰ As for traffic volume data regarding the quantitative effects of the effectiveness, Tables 4, 5, 6, 7 in this report give the traffic data that was possible to collect at that time to measure the project effects.

¹¹ Because the traffic measurement points for the measurement of traffic volume around the project areas before the project implementation (Table 7) are not known.

¹² National Institute of Statistics (2009) "Cambodia Population Census 2008"

Highway connecting Bangkok (the capital city of the neighboring country, Thailand) and Phnom Penh, it is seen as an important highway. Therefore, it is assumed that the development of the national road No. 5 influenced the improvement of logistics routes in the surrounding areas.

Also, the traffic volume of the national road No. 11 in the Prey Veng City areas increased approximately 10% for each type of vehicle after the project implementation (2015) compared to before the project (2014) (Table 6). It is considered that the reconstruction of the 8 project bridges on the national road No. 11 was one of the reasons for this increase. Meanwhile, it is assumed that the traffic volume of heavy vehicles increased due to the maximum vehicle weight for the 8 bridges was increased to 40 tons from 15 tons by the project (Table 6).

Table 4: Traffic Volume of Kampong Chhnang City Areas
(National Road No. 5, Around Pk¹³ 87km + 300m)

Unit: Number/Day

	2011	2014	2015 (Completion Year)
Cars / 4WD / Passenger Vans	3,098	4,271	4,043
Mini Buses / Buses / Light Commercial Vehicles	548	744	742
Heavy Trucks (2 Axle – 5 Axle Trucks)	504	716	713
Full Trailers (4 Axle – 6 Axle Truck Trailers)	49	75	297
Total	4,199	5,806	5,795

Source: Documents provided by MPWT

Note: The traffic volume at around 87km + 300m north-north west from Phnom Penh on the national road No. 5.

Table 5: Traffic Volume of Kampong Chhnang City Areas
(National Road No. 5, Around Pk 92km + 400m)

Unit: Number/Day

	2011	2014	2015 (Completion Year)
Cars/ 4WD / Passenger Vans	1,935	3,333	3,049
Mini Buses / Buses / Light Commercial Vehicles	356	715	546
Heavy Trucks (2 Axle – 5 Axle Trucks)	429	1,008	859
Full Trailers (4 Axle – 6 Axle Truck Trailers)	48	144	381
Total	2,768	5,200	4,835

Source: Documents provided by MPWT

Note: The traffic volume around 92km + 400m north-north west from Phnom Penh on the national road No.5.

¹³ Pk is an abbreviation of Point kilometer, which describes the distance from the national road starting point.

Table 6: Traffic Volume of Prey Veng City Areas
(National Road No. 11, Around Pk 63km + 250m)

Unit: Number/Day

	2014	2015 (Completion Year)
Cars / 4WD / Passenger Vans	892	957
Mini Buses / Buses / Light Commercial Vehicles	277	306
Heavy Trucks (2 Axle – 5 Axle Trucks)	717	798
Full Trailers (4 Axle – 6 Axle Truck Trailers)	188	210
Total	2,074	2,271

Source: Documents provided by MPWT

Note: The traffic volume near CHHNAT Bridge (BR-5 Bridge) indicated in figure 2 of the report.

Table 7: Traffic Volume of Project Areas before Project Implementation

Unit: Number/Day

	Kampong Chhnang City Main Street (2012)	National Road No. 11 (2012)
Cars / Small Cargo Vehicles	1,221	598
Mini Buses / Buses	92	108
Heavy Trucks	19	150
Full Trailers	0	29
Total	1,332	885

Source: Documents provided by JICA

Note: Measurement points for the above traffic volume are unknown.

(2) Maintenance Cost of the Kampong Chhnang DPWT for Project Roads

As for the maintenance costs of the Kampong Chhnang DPWT for project roads, at the time of planning, each road maintenance item was recorded as an expense for the effect indicators. However, at the time of the ex-post evaluation, it was found that maintenance costs for the project roads had been recorded as expenses which reflected the total labor cost for the maintenance staff of the roads. Therefore, the maintenance information relevant to this indicator were not maintained as the accrual method was different for the time of planning (recorded as inspection items of the maintenance cost for project roads) and the time of the ex-post evaluation (recorded as the labor costs for project roads maintenance). Thus, it was difficult to evaluate the indicator.

(3) Maintenance Cost of the Kampong Chhnang DPWT for the Project Drainage System

The maintenance cost of the Kampong Chhnang DPWT for the project drainage system was 1,332 USD in 2015, and 748 USD and 747 USD in 2016 and 2017 respectively. Thus, the target value was achieved (Table 8).

Table 8: Maintenance Cost of the Kampong Chhnang DPWT for the Project Drainage System

Unit: USD/Year

Indicator	Baseline	Target	Actual		
	2012	2017	2015	2016	2017
		2 Years After Completion	Completion Year	1 Year After Completion	2 Years After Completion
Maintenance cost of the Kampong Chhnang DPWT for the Project Drainage System	About 3,100	About 1,200	1,332	748	747

Source: Documents provided by JICA and documents provided by MPWT

Note: According to MPWT, the above actual maintenance cost after 2015 was the sum of the maintenance cost of drainage systems for several towns in Kampong Chhnang Province including Kampong Chhnang City. However, since there are only a few towns in the province where drainage systems were installed, the above actual maintenance cost of the drainage system can be seen as mostly including the maintenance cost for Kampong Chhnang City, and thus can be evaluated for the achievement.

(4) Period of flooding of the Road Shoulder in Kampong Chhnang City

The ponding period of the road shoulder in Kampong Chhnang City became 0 days after project implementation, which was an achievement of the target value (Table 9).

Table 9: Ponding Period of the Road Shoulder in Kampong Chhnang City

Unit: Day/Year

Indicator	Baseline	Target	Actual		
	2012	2017	2015	2016	2017
		2 Years After Completion	Completion Year	1 Year After Completion	2 Years After Completion
Ponding Period of the Road Sholder	About 50	Almost 0	0	0	0

Source: Documents provided by JICA and response to interview with Kampong Chhnang DPWT

Note: Although the Executing Agency had no data for the period of flooding of the road shoulder, they confirmed that no flooding on the road shoulder had occurred since project completion. It was therefore evaluated as 0 days.

(5) Routine Maintenance Cost of the Prey Veng DPWT for the Project Bridges

The routine maintenance cost of the Prey Veng DPWT for the project bridges was 1,858 USD in 2016, and 1,855 USD in 2017. Thus, the target value was mostly achieved (Table 10).

Table 10: Maintenance Cost of the Prey Veng DPWT for the Project Bridges

Unit: USD/Year

Indicator	Baseline	Target	Actual	
	2012	2017	2016	2017
		2 Years After Completion	1 Year After Completion	2 Years After Completion
Maintenance Cost of the Prey Veng DPWT for the Project Bridges	About 3,500	About 1,800	1,858	1,855

Source: Documents provided by JICA and documents provided by MPWT

Note: The 3,500 USD maintenance cost for the project bridges for 2012 (baseline) which was set at the time of planning included both routine and periodic maintenance costs. Since it is not time to implement periodic maintenance on the project bridges yet, the above maintenance cost of the project bridges (Target and Actual) included only routine maintenance costs.

(6) Travel Time (BR-1 Bridge to BR-18 Bridge) on the National Road No. 11 due to Improvement of Traveling Speed

Travel Time (BR-1 Bridge to BR-18 Bridge) on the national road No. 11 dropped to approximately 70 minutes in 2017 due to improvements in the traveling speed, thus achieving the target value (Table 11).

Table 11: Travel Time (BR-1 Bridge to BR-18 Bridge) on the National Road No. 11 due to Improvement of Traveling Speed

Indicator	Baseline	Target	Actual	
	2012	2017	2016	2017
		2 Years After Completion	1 Year After Completion	2 Years After Completion
Travel Time (BR-1 Bridge to BR-18 Bridge) on the national road No. 11 due to improvement of traveling speed	About 120 Minustes	About 80 Minustes	N/A	About 70 Minutes

Source: Documents provided by JICA and documents provided by Prey Veng DPWT

Note: The above travel time for 2017 was measured by the Prey Veng DPWT at the time of the ex-post evaluation, and it was not measured before 2016.

3.3.1.2 Qualitative Effects (Other Effects)

The ex-post evaluation conducted key informant interviews with local residents and transporters located near the project facilities. Hearings with the Executing Agencies of the project such as MPWT and DPWT were also conducted in order to measure the effectiveness of the project and the qualitative effects of the impacts.¹⁴ The results are shown below.

(1) Improvement in Traffic Safety in the Project Area

[Kampong Chhnang Site]

Before the project started, accidents used to occur frequently due to the many potholes on the project roads in Kampong Chhnang City. The potholes were an obstacle for drivers since they were difficult to see by rainwater on rainy days. After project completion, the number of accidents decreased thanks to the repairing of these potholes. Moreover, improvements in traffic safety have been confirmed as the number of floods has decreased thanks to the installation of the project drainage system. The installation of road traffic signs and center-lines on project roads led not only to a decrease in the number of accidents, but also to a mitigation of traffic congestion. The safety of pedestrians has also improved as sidewalks were installed for the city roads by the project.

On the other hand, street vendors and taxi drivers say that they have recognized an increase in traffic accidents compared to before the project implementation, as vehicles drive at a greater

¹⁴ Kampong Chhnang Site: Key informant interviews were conducted with 2 local residents, 1 street vendor, 1 taxi driver, 2 transporters (5 Male, 1 Female). Prey Veng Site: Key informant interviews were conducted with 3 local residents, 3 street vendors, 3 taxi drivers, 3 transporters (10 Male, 2 Female).

speed on the improved roads in Kampong Chhnang City and careless driving has become noticeable since project completion.¹⁵

[Prey Veng Site]

As the project bridges were made from iron before the project implementation, vehicles needed to drive slowly, especially on the rainy days, since it was easy for them to slip when crossing the bridges. According to a street vendor, crossing the project bridges felt dangerous as some of the bridges had been severely damaged before the project. After the reconstruction by the project, it is no longer necessary for vehicles to drive slowly as the project bridges have been reconstructed and an improvement in traffic safety at the project bridges has been confirmed. In addition, the safety of pedestrians on the bridges has improved as the sidewalks were installed on the bridges by the project.

(2) Improvement of Traffic Accessibility in the Project Areas

[Kampong Chhnang Site]

Before project implementation, the water level on city roads frequently became high on rainy days and it was necessary to wait an average of 10 minutes for a lowering of the water level. An improvement in traffic accessibility has been confirmed since the above problems have not occurred after the installation of the drainage system by the project. Also, the number of bus services has increased since project completion, and the number of small buses (passenger vans) operating in inner-city areas has become vast and countless. Additionally, according to street vendors who regularly use large-sized buses, the number of large-sized buses (for long distance) which connect Kampong Chhnang City and other cities rose from 10/day before the project started to 40/day after project implementation. Moreover, the travel time of large-sized buses decreased due to the improvement of inner-city and outer-city roads. For example, the travel time between Kampong Chhnang City to Battambang City (190km) was 5-6 hours before the project implementation, but shortened to 2-3 hours after project completion.¹⁶

[Prey Veng Site]

Before the project started, as the project bridges had only one lane, it took time to cross. On average, it was necessary to wait 10 minutes for oncoming cars. After the bridges became two lanes through the project, it is now possible to cross without waiting for oncoming cars and thus an improvement in traffic accessibility was confirmed.

¹⁵ These traffic accidents mainly occur through the carelessness of drivers, and they are different to the traffic accidents caused by aforementioned potholes.

¹⁶ Decreased travel time is considered to be mainly thanks to the improvement of road conditions on the whole travel section



Improved National Road No. 5
(in Kampong Chhnang City)



Improved Street Road
(in Kampong Chhnang City)



Installed Drainage System
(in Kampong Chhnang City)



KBAL BOEUNG Bridge
(BR-4 Bridge) after reconstruction



MEBON Bridge (BR-8 Bridge)
after reconstruction



ROM LECH Bridge (Clv-2 Bridge)
after reconstruction

3.3.2 Impacts

3.3.2.1 Intended Impacts

(1) Traffic Volume around the Project Areas¹⁷

Based on the traffic volume data for the project areas of the national roads No. 5 and No. 11, it can be seen that the overall traffic volume has increased, regardless of the type of vehicles, comparing before (2011 and 2014) and after (2015) project implementation (Table 12, 13, and 14).

Table 12: Traffic Volume of Oudong City Areas
(National Road No. 5, Around Pk 39km + 500m)

Unit: Number/Day

	2011	2014	2015 (Completion Year)
Cars / 4WD / Passenger Vans	4,874	5,992	6,300
Mini Buses / Buses / Light Commercial Vehicles	740	842	1,582
Heavy Trucks (2 Axle – 5 Axle Trucks)	737	992	960
Full Trailers (4 Axle – 6 Axle Truck Trailers)	60	117	107
Total	6,411	7,943	8,949

Source: Documents provided by MPWT

Note: Oudong City is located in between Phnom Penh City and Kampong Chhnang City on the national road No. 5.

¹⁷ There was no indication of quantitative effects for the impacts in either the ex-ante evaluation sheet or the preparatory survey report. This is the traffic data that it was possible to collect at this time and to use to measure the project impacts.

Table 13: Traffic Volume of Pursat City Areas
(National Road No. 5, Around Pk 184km + 500m)

Unit: Number/Day

	2011	2015 (Completion Year)
Cars / 4WD / Passenger Vans	2,967	3,700
Mini Buses / Buses / Light Commercial Vehicles	444	618
Heavy Trucks (2 Axle – 5 Axle Trucks)	570	1,210
Full Trailers (4 Axle – 6 Axle Truck Trailers)	65	198
Total	4,046	5,726

Source: Documents provided by MPWT

Note: Pursat City is located about 90km in a northwestward direction from Kampong Chhnang City on the national road No. 5.

Table 14: Traffic Volume of Neak Luong City Areas
(National Road No. 1, Around Pk 64km + 200m)

Unit: Number/Day

	2011	2014	2015 (Completion Year)
Cars / 4WD / Passenger Vans	2,157	4,104	4,633
Mini Buses / Buses / Light Commercial Vehicles	318	739	865
Heavy Trucks (2 Axle – 5 Axle Trucks)	526	1,192	1,386
Full Trailers (4 Axle – 6 Axle Truck Trailers)	47	458	499
Total	3,048	6,943	7,383

Source: Documents provided by MPWT

Note: Neak Luong City is located at the intersection point of the national roads No. 1 and No. 11.

(2) Mitigation of Flood Damage around the Project Areas¹⁸

Before project implementation, crops were seriously damaged through floods in the Kampong Chhnang site, and many houses were flooded below the floor level during the flood of 2011. At the Prey Veng site, floods of approximately 20 – 30 cm (50cm – 1m depending on the place) occurred before the project started. Therefore, Crops and rice paddies were damaged, and it was necessary to move livestock to different places. It was confirmed that such problems have not happened since project completion¹⁹.



Key informant interview with local residents.

¹⁸ As mentioned above, in order to measure the qualitative effects of the impacts, for item (2), (3), (4), (5) in the impacts section, key informant interviews were conducted with the same group of people indicated in the effectiveness section.

¹⁹ In association with the project mitigation of flood damage was considered to have been achieved by the installation of the drainage system in the Kampong Chhnang site. As for the Prey Veng site, mitigation was considered to have been achieved by the reconstructed bridges having been properly designed, with estimated high-water levels, height of girders, location of abutments etc. for each bridge.

(3) Improvement in the Hygienic Environment of Local Residents around the Project Areas

Before the project started in the project area of Kampong Chhnang site, bad odors used to occur at the time of raining because of pooled rain water and left garbage. Due to the installation of the drainage system by the project and regular garbage collections by the provincial municipality, such bad odors have not occurred since the project and an improvement in hygienic environment has been confirmed.

(4) Improvement in Logistics on National Road No. 5 and National Road No. 11

After project implementation, it was confirmed that the number of large-sized bus services (for long distance) had increased for both the Kampong Chhnang and Prey Veng sites, operating to connect inner and outer-city areas (Kampong Chhnang site: about 10/day before the project, about 40/day after the project; Prey Veng site: about 15/day before the project, about 70/day after the project). It also became possible to operate the bus services according to the schedule and an improvement in logistics on the national road No. 5 and the national road No. 11 was confirmed.

Meanwhile, even though improvements in logistics for both of the project areas was confirmed as mentioned above, street vendors and taxi drivers reported an increase in traffic accidents since traffic volume also increased with the above improvements. Now local residents need to walk carefully, paying attention to passing vehicles when they cross the project roads.

(5) Improvements in the Living Environment around the Project Areas

Before project implementation in both the Kampong Chhnang and Prey Veng project areas, on rainy days, residents were obliged to travel only when necessary since floods occurred often and it was frequently necessary to evacuate. After project implementation, an improvement in the living environment around the project areas was confirmed, and it became possible to go out easily, even on rainy days, as floods no longer happened. Also at the Prey Veng site, one of the local residents was able to visit their paddy fields and farms more frequently since it had become easier for them to go out on rainy days. The production level of their farm crops increased, and their income also increased as they were able to sell more crops than before.

3.3.2.2 Other Positive and Negative Impacts

(1) Impacts on the Natural Environment

The project was given a Category B based on the *JICA Guidelines for Environmental and Social Considerations* (2010). This was based on the facts that: ① the project was considered to have no major negative impact on the environment and was not categorized as a large scale project within the road sector etc. as specified in the guidelines, ② the project has neither influencing characteristic nor affecting susceptible region as listed in the guidelines.

Additionally, the preparation of an environmental assessment report was not required for environmental approval and license according to the domestic law of Cambodia.

Through the interviews and hearings with the Executing Agency (MPWT) and construction management consultants in this ex-post evaluation, it was confirmed that environmental monitoring and mitigation measure in relation to air pollution (dust, etc.) / water pollution (turbid water, etc.) / noise (noise from operation of construction machinery, etc.), were conducted by the construction management consultants during construction.²⁰ Also, waste disposal, soil pollution countermeasure, heads-up regarding HIV and AIDS infection, regular learning and meeting for improving labor environment and accident prevention were conducted during the construction. These activities were not continued after the project completion. However, according to interviews with the Executing Agency and local residents close to the project area, there were neither negative impacts on, nor complaints about the natural environment.

(2) Resettlement and Land Acquisition

According to the Executing Agency (MPWT), the total area of land acquisition was 7,100 m² and the number of resettled residents was 23 households in relation to the project implementation. Resettlement and land acquisition were conducted according to the process of Cambodia and the Abbreviated Resettlement Plan.²¹ There were neither negative impacts nor complaints due to resettlement and land acquisition, based on interviews with the Executing Agency and local residents.

(3) Coordination / Demarcation with ADB for Targeting the Project Area

According to the interview with ADB, there was information sharing regarding the project bridges on the national road No. 11 at the formulation stage of the project. There was also a demarcation to prevent overlapping between this project and the ADB project. Since the connection of the neighboring areas and the project areas became smoother through both the reconstruction of bridges for this project and the ADB project, the whole road network of the subject areas has improved.

This project has mostly achieved its objectives. Therefore effectiveness and impacts of the project are high.

²⁰ The environment monitoring was conducted in accordance with the table 3-2-10 in the preparatory survey report.

²¹ According to the preparatory survey report, as for the resettlement policy of main donors such as JICA, World Bank, ADB at that time, the life quality of the affected residents should be recovered to the level of before the project implementation at least. On the other hand, the specific policy or procedure at Cambodia side for recovering the life of affected residents was still under consideration. Since the Executing Agencies of the project made fine adjustment as to pay land acquisition cost 3 USD/m², 8 USD/m², 16 USD/m², depending on the location, also the necessary budget allowance was provided without affecting the project period, it is considered that the project took appropriate and careful actions for the resettlement.

3.4 Sustainability (Rating: ②)

3.4.1 Institutional / Organizational Aspect of Operation and Maintenance

MPWT is the control authority for the project on the Cambodia side, and the Road Infrastructure Department (herein after called RID) is responsible for supervising the operation and maintenance (herein after called O&M). Direct routine periodic O&M for the project facilities is the responsibility of the Kampong Chhnang DPWT (for the project roads, the project drainage system) and the Prey Veng DPWT (for the project bridges).²² When emergency maintenance or difficult projects are required to be handled by the DPWT, the Equipment & Road Construction Department and the Road Construction & Maintenance Department which are affiliated with MPWT, are in charge of O&M. Tables 15 and 16 below indicate each department for the O&M of MPWT, the Kampong Chhnang DPWT, and the Prey Veng DPWT as of December 2017. The tasks and areas of responsibilities for O&M are clear and no major issues have been observed in terms of the institutional aspects of O&M which is conducting by the Executing Agency now.

Table 15: Organizational Structure for O&M in MPWT

Department	Responsibility	Numbers
RID	In charge of supervising O&M for roads / bridges, conducting training for staff, and periodic maintenance.	About 100
Equipment & Road Construction Department	In charge of conducting the training for heavy machinery operation and construction works for roads / bridges.	About 100
Construction & Maintenance Department	In charge of O&M and construction works for roads / bridges.	About 300

Source: Response to interviews with MPWT

Table 16: Organizational Structure for O&M in Kampong Chhnang DPWT and Prey Veng DPWT

Department	Responsibility	Numbers
Office of Public Works (Kampong Chhnang DPWT)	In charge of routine and periodic O&M	11
Office of Public Works (Prey Veng DPWT)		9

Source: Response to interviews with Kampong Chhnang DPWT and Prey Veng DPWT

3.4.2 Technical Aspect of Operation and Maintenance

Most of the staff in RID in charge of O&M have a higher level of academic background than university level, while more than half the staff of the Kampong Chhnang DPWT and the Prey Veng DPWT also have a higher level of academic background than university level. O&M works of the project facilities are implemented according to the O&M manual, which was prepared by MPWT. Three types of new O&M guidelines (*Road O&M Guidelines*, *Bridge O&M Guidelines*, *Bridge Inspection Guidelines*, (2017)) were published in December 2017 by the following JICA

²² Each DPWT implements periodic maintenance activities under the supervision and instruction of RID.

Technical Corporation Project. Moreover, RID conducts the following training in relation to the O&M of the project facilities for MPWT and DPWT technical staff (Table 17).

Table 17: Training of the staff for MPWT and DPWT

Name of Training	Target Staff	Purpose	Frequency
Road O&M Program	45 MPWT Technical Staff 40 DPWT Technical Staff	Capacity Building	Once a Year
Bridge O&M Program	35 MPWT Technical Staff 37 DPWT Technical Staff		

Source: Response to interviews with MPWT

The JICA Technical Cooperation Project, The Project for Strengthening Capacity for the Maintenance of Roads and Bridges (2015-2018) was in progress at the time of the ex-post evaluation.²³ It is expected that the ability for the O&M of roads and bridges on the part of RID and DPWT will improve through the JICA Project. This should include enhancing the capacity for road and bridge inspection and repair, establishing the maintenance cycle, and providing training programs in relation to O&M etc.

According to the Executing Agency (MPWT), there was an opinion that there are not enough laboratories for the official quality inspection of the construction materials²⁴ which are used for repairing potholes and overlay etc. However, it was not possible to confirm the actual issues which occurred during the O&M works (examples which actually happened etc.). Thus, no major issues have been observed in terms of the technical aspect of O&M.

3.4.3 Financial Aspect of Operation and Maintenance

The actual O&M budgets of MPWT, the Kampong Chhnang DPWT and the Prey Veng DPWT for the past 4 years (2014 - 2017) are shown in Tables 18 and 19. Also, MPWT establishes O&M budgets in Chapter 61 and Chapter 21, the details of which are indicated in Table 18. The annual budget and O&M budget for MPWT are funded only by the government of Cambodia, and no subsidy from a special account is provided.

²³ The expected outcomes of “The Project for Strengthening Capacity for the Maintenance of Roads and Bridges (2015-2018)” are follows: (i) The bridge maintenance cycle is established in RID, (ii) Road and bridge inspection and repair capacity of RID is enhanced, (iii) Road and bridge maintenance cycle is introduced to other DPWT and concerned agencies.

²⁴ Asphalt, Laterite (Red Clay), Mixed Aggregate etc.

Table 18: Actual Budget for O&M in MPWT (2014 - 2017)

Unit: Million Dollar

	2014	2015	2016	2017
Actual Budget for O&M in MPWT	123.75	118.5	133	148.75
Actual Budget for Routine Maintenance in MPWT (Chapter 61)	23	30.75	31.25	41.75
Actual Budget for Periodic Maintenance in MPWT (Chapter 61)	27	14	18.25	18.25
Actual Budget for Emergency Maintenance in MPWT (Chapter 61)	12.5	12.5	13.5	10
Actual Budget for New Construction in MPWT (Chapter 21)	61.25	61.25	70	78.75

Source: Documents provided by MPWT

Table 19: Actual Budget for O&M in DPWT for Project Provinces (2014 - 2017)

Unit: Million Dollar

	2014	2015	2016	2017
Actual Budget for O&M in the Kampong Chhnang DPWT	2.39	2.39	3.27	2.48
Actual Budget for O&M in the Prey Veng DPWT	0.68	2.62	3.51	3.17

Source: Documents provided by MPWT

According to the interview with the Executing Agency (MPWT), periodic maintenance has been delayed due to the budgetary deficit for periodic maintenance, and as infrastructure facilities have become depleted, in many cases the problems are eventually dealt with by conducting new construction. The periodic maintenance cost of the ODA loan project the National Road No. 5 Improvement Project (Prek Kdam-Thlea Ma'am Section) was expected to be 212 thousand USD/km²⁵ for each 10 years. On this assumption, it is considered that 48 million USD per year would be required only for 1 digit national roads (2,243 km²⁶) which are similar to the road standard of this project, and the budget for periodic maintenance is below the level at the time of the ex-post evaluation.²⁷ Even though no issues were observed for the project facilities at the time of ex-post evaluation, periodic maintenance will be required from a long term perspective. Therefore, there is a possibility of facing some issues relating to the financial aspect of O&M in the future.

3.4.4 Status of Operation and Maintenance

Routine maintenance and periodic maintenance have been conducted according to the inspection items, as mentioned in Table 20, by the Kampong Chhnang DPWT (for the project roads and the project drainage system) and the Prey Veng DPWT (for the project bridges) under the supervision of RID. Since project completion, the project facilities have been kept in good condition and no damages have been observed in terms of the current status according to the visual site inspection at the ex-post evaluation.

²⁵ JICA (2013) "National Road No. 5 Improvement Project (Prek Kdam-Thlea Ma'am Section)" Feasibility Study Report, p.33.

²⁶ At the time of November 2014

²⁷ 212 thousand USD x 2243 km ÷ 10 years ≒ 48 million USD/year

Table 20: Inspection Item of O&M for the Project Facilities

Type of Maintenance	Inspection Item	Frequency
Routine Maintenance	<ul style="list-style-type: none"> • Visual inspection and cleaning for pavements, road shoulders, drainages, bridges, piers • Weeding • Repairing cracks in pavements and pothole • Painting for traffic signs / Road marking 	Everyday
Periodic Maintenance	<ul style="list-style-type: none"> • Overlay for pavements, part resurfacing 	Every 5 – 6 years

Source: Response to interviews with MPWT

Since the design policy of project facilities was to have durability and low-maintenance structure with acceptable costs, the mud reservoir for clog prevention and the waste inflow prevention fence were provided in the project roads drainage system, also put the hinge type grating basin²⁸ for the drainage basin and the maintenance basin which makes easy to conduct visual inspection of basins and opening-closing. In addition, the structure of the project bridges did not have expansion joints that was not required to conduct regular maintenance. It is considered that these design policies were contributed to the efficiency of operation and maintenance activity by the Executing Agency.

Some minor problems have been observed in terms of the financial aspect. Therefore sustainability of the project effects is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The objective of this project was to restore the function of road infrastructure in the disaster area to its pre-disaster condition by rehabilitation and improvement of roads and drainage system in Kampong Chhnang City and by reconstructing 8 decaying bridges the on national road No. 11 in Prey Veng Province, all of which were affected by the flood of 2011, thereby contributing to the mitigation of flood damage and smoother regional transport in the affected areas.

The project was consistent with the development plan and development needs of Cambodia, as well as with Japan's ODA policy. Therefore, the project relevance is high. Meanwhile, the project cost and project period were in accordance with the plan. Therefore, the efficiency of the project is high. As for the project effects, it is confirmed that the project brought positive effects in an increase in traffic volume at the project areas, a decrease in the maintenance cost of the Kampong Chhnang DPWT for the project drainage system, a decrease in the maintenance cost of the Prey Veng DPWT for project bridges, and a reduction in the travel time from BR-1 bridge to BR-18 bridge on the national road No. 11. Improvements in traffic safety and traffic accessibility in the project areas were also observed. In addition, it is considered that there has been a mitigation of

²⁸ Connecting a square block type ditch lid with a frame by a hinge, and making it easy for opening/closing of the lid.

flood damage in the project areas, improvements in the hygienic and living environment, and improvements in logistics on the national roads No. 5 and No. 11. The project is found to have contributed to these improvements, and thus, its effectiveness and impacts are high. The sustainability of project effects is fair since no major problems have been observed in the institutional and technical aspect as well as status of operation and maintenance for the project, but some minor problems have been observed in terms of the financial aspect, due to insufficient budget allocation for periodic maintenance.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

Prioritization of Periodic Maintenance Activities

According to the interview with the Executing Agency (MPWT), with the medium to long term view, the road surface has become depleted because of delays in periodic maintenance activities caused by constraints on the budget for periodic maintenance. The problem eventually tends to be dealt with through new construction. Both the national road No. 5 and the national road No. 11 hold an important position in the road network of Cambodia, and the traffic volume of cargo vehicles has increased remarkably in recent years, it is required to conduct periodic maintenance activities on a timely basis from the perspective of reducing the life-cycle cost for roads and bridges. In order to address the budgetary deficit for periodic maintenance, it is recommended that MPWT prioritize appropriately when formulating O&M plans in the future, and when conducting proper periodic maintenance activities for target sections of the project.

4.2.2 Recommendations to JICA

None

4.3 Lessons Learned

(1) Necessity of Operation / Effect Indicators for an ODA Project

It was not possible to collect one of the useful operation / effect indicators for this project because the interpretation of the indicator by the Executing Agency was different at the time of the ex-ante evaluation and the ex-post evaluation. Even though the collection of data for the operation / effect indicator is not included in the agreement with the government of a recipient country by the project, it is important to have appropriate data for examining project effects for an ODA project. Thus, it is necessary that the Executing Agency is requested to fully understand, record, and steadily execute data collection for the operation / effect indicators.

(2) Importance of Coordination / Demarcation with Other Donors for Targeting Project Areas

The project was to restore the road infrastructure in the affected areas after the flood of 2011. Other donors, such as ADB, also implemented similar projects. There was information sharing regarding the project bridges at the formulation stage, and there was a demarcation for targeting the project area to avoid overlapping of project bridges etc. between the donors. Thus, since it is considered that the whole of the road network in the subject areas has improved with the improvement of the infrastructure facilities connecting project roads and bridges, and that the impact of the project has been seen extensively even outside the project areas, it is expected that same kind of coordination will take place in similar projects in the future.

(3) Suggestion to Design Policy for Roads/Bridges

In terms of O&M for roads/bridges in developing countries, there are cases that faced difficulties in O&M activities due to insufficient budget of executing agencies in general. The design policy of project facilities was to have durability and low-maintenance structure with acceptable costs²⁹. Since it is assumed that the design policies were contributed to the efficiency of operation and maintenance activity by the Executing Agency, it is desirable to apply same kind of considerations to design policy for facilities of similar road/bridge projects.

End

²⁹ Stated in “3.4.4. Status of Operation and Maintenance” of the report.