



# Completion Report

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Project Number: 42334-013  
Loan Number: 2670  
August 2018

## Cambodia: Rural Roads Improvement Project

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Asian Development Bank

## CURRENCY EQUIVALENTS

Currency Unit – Riel (KR)

		<b>At Appraisal</b> (18 Jan 2010)	<b>At Project Completion</b> (30 June 2016)
KR1.00	=	\$0.00025	\$0.00025
\$1.00	=	KR4,222	KR4,084
SDR 1.00	=	\$1.4800	\$1.3939

## ABBREVIATIONS

ADB	–	Asian Development Bank
DBST	–	double bituminous surface treatment
DDIS	–	detailed design and implementation supervision
EIRR	–	economic internal rate of return
EMP	–	environmental management plan
EMS	–	emergency management system
FY	–	fiscal year
GAP	–	gender action plan
GRM	–	grievance redress mechanism
HHTPP	–	HIV/AIDS and human trafficking prevention program
IEE	–	initial environmental examination
KEXIM	–	Export–Import Bank of Korea
km	–	kilometer
LBAT	–	labor-based appropriate technology
MEF	–	Ministry of Economy and Finance
MRD	–	Ministry of Rural Development
NDF	–	Nordic Development Fund
PDRD	–	Provincial Department of Rural Development
PMU	–	project management unit
PPRR	–	project procurement–related review report
RRIP	–	Rural Roads Improvement Project
SEO	–	Social and Environment Office
SEMR	–	semi-annual environmental monitoring report
TA	–	technical assistance
UXO	–	unexploded ordnance
VCCT	–	voluntary counselling confidential and testing

## NOTES

- (i) The fiscal year (FY) of the Government of the Kingdom of Cambodia is from 1 January to 31 December. “FY” before a calendar year denotes the year in which the fiscal year ends, e.g., FY2018 ends on 31 December 2018.
- (ii) In this report, \$ refers to United States dollars unless otherwise stated.

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## BASIC DATA

### A. Loan Identification

1.	Country	Kingdom of Cambodia
2.	Loan number and financing source	2670, Concessional Ordinary Capital Resources
3.	Project title	Rural Roads Improvement Project
4.	Borrower	Kingdom of Cambodia
5.	Executing agency	Ministry of Rural Development
6.	Amount of loan	SDR 23,134,000 (\$35,000,000 equivalent)
7.	Project completion report number	1706
8.	Financing modality	Project loan

### B. Loan Data

1.	Appraisal	
	– Date started	08 January 2010
	– Date completed	18 January 2010
2.	Loan negotiations	
	– Date Started	28 July 2010
	– Date completed	29 July 2010
3.	Date of Board approval	23 September 2010
4.	Date of loan agreement	22 October 2010
5.	Date of loan effectiveness	
	– In loan agreement	22 December 2010
	– Actual	06 January 2011
	– Number of extensions	0
6.	Project completion date	
	– Appraisal	31 December 2015
	– Actual	31 December 2015
7.	Loan closing date	
	– In loan agreement	30 June 2016
	– Actual	30 June 2016
	– Number of Extensions	0
8.	Financial closing date	
	– Actual	13 December 2016
9.	Terms of Loan	
	– Interest Rate	1.0% per annum (grace period) 1.5% per annum (amortization period)
	– Maturity (number of years)	32 years
	– Grace Period (number of years)	8 years
10.	Terms of Relending (if any)	Not applicable
	– Interest rate	
	– Maturity (number of years)	
	– Grace period (number of years)	
	– Second-step borrower	

## 11. Disbursements

## a. Dates

<b>Initial Disbursement</b> 11 April 2011	<b>Final Disbursement</b> 21 October 2016	<b>Time Interval</b> 66 months
<b>Effective Date</b> 06 Jan 2011	<b>Actual Closing Date</b> 30 Jun 2016	<b>Time Interval</b> 65 months

## b. Amount (\$ million)

<b>Category<sup>a</sup></b>	<b>Original Allocation (1)</b>	<b>Increased during Implementation (2)</b>	<b>Cancelled During Implementation (3)</b>	<b>Last Revised Allocation (4=1+2-3)</b>	<b>Amount Disbursed (5)</b>	<b>Undisbursed Balance (6=4-5)</b>
01A	9.310	0.244	-	9.554	9.554	(0.000)
01B	10.790	1.086	-	11.876	11.876	0.000
01C		3.346		3.346	3.346	(0.000)
01D		0.367	-	0.367	0.367	0.000
02	0.060	0.007	-	0.067	0.067	(0.000)
03A	3.200	0.914	-	4.114	4.114	0.000
03B	1.730		-	1.730	1.683	0.047
03C	0.840		-	0.840	0.823	0.017
03D		0.381	-	0.381	0.381	0.000
04	0.560	(0.560)	-	-	-	-
04A		0.201	-	0.201	0.201	(0.000)
04B		0.491	-	0.491	0.491	0.000
05	0.920		-	0.920	0.652	0.268
06	7.590	(7.186)	-	0.404	-	0.404
<b>Total</b>	<b>35.000</b>	<b>(0.709)</b>	<b>-</b>	<b>34.291</b>	<b>33.554</b>	<b>0.737</b>

( ) = negative number.

<sup>a</sup> 01A = civil works, package B; 01B = civil works, package C; 01C = civil works, packages D–F; 01D = civil works, package G; 02 = equipment; 03A = detailed design and implementation supervision; 03B = road asset management program; 03C = road safety and safeguards program; 03D = HIV awareness; 04 = incremental administrative costs other than 02 above (old category); 04A = incremental administrative costs other than 02 above; 04B = incremental administrative costs other than 02 above in cots; 05 = interest charges; 06 = unallocated.

## C. Project Data

## 1. Project Cost (\$ million)

<b>Cost</b>	<b>Appraisal Estimate</b>	<b>Actual</b>
Foreign exchange cost	31.43	33.14
Local currency cost	35.57	32.45
<b>Total</b>	<b>67.00</b>	<b>65.59</b>

## 2. Financing Plan (\$ million)

<b>Cost</b>	<b>Appraisal Estimate</b>	<b>Actual</b>
Implementation costs		
Borrower financed	7.25	6.75
ADB financed	34.08	32.90
KEXIM cofinanced	19.31	20.98
NDF grant	5.40	4.29
<b>Total implementation cost</b>	<b>66.04</b>	<b>64.92</b>
Interest during construction		
Borrower financed	0.00	0.00
ADB financed	0.92	0.65
KEXIM cofinanced	0.04	0.02

<b>Cost</b>	<b>Appraisal Estimate</b>	<b>Actual</b>
NDF grant	0.00	0.00
<b>Total interest during construction</b>	<b>0.96</b>	<b>0.67</b>

ADB = Asian Development Bank, KEXIM = Export-Import Bank of Korea, NDF = Nordic Development Fund.

3. Cost Breakdown by Project Component (\$ million)

<b>Component</b>	<b>Appraisal Estimate</b>	<b>Actual</b>
<b>A. Investment Cost</b>		
1. Civil Works	39.32	49.47
2. DDIS Consulting Services		
- ADB	3.86	4.52
- KEXIM	1.41	2.19
3. Road Asset Management (Consulting)	2.00	1.85
4. Road Safety and Safeguards		
- Road Safety	0.70	0.90
- HHTPP	0.25	0.42
5. Climate Change Adaptation Program	5.40	4.70
<b>Subtotal</b>	<b>52.94</b>	<b>64.06</b>
<b>B. Incremental Administration Cost</b>		
1. Project Management	1.43	0.37
2. Priority Operating Cost	0.60	0.49
<b>Subtotal</b>	<b>2.03</b>	<b>0.86</b>
<b>C. Contingencies</b>		
1. Physical	5.48	0.00
2. Price	5.59	0.00
<b>Subtotal</b>	<b>11.07</b>	<b>0.00</b>
<b>D. Financial Charge During Implementation</b>		
1. Interest during construction	0.92	0.65
2. Service Charge (KEXIM)	0.04	0.02
<b>Subtotal</b>	<b>0.96</b>	<b>0.67</b>
<b>Total</b>	<b>67.00</b>	<b>65.59</b>

ADB = Asian Development Bank; DDIS = detailed design and implementation supervision, HHTPP = HIV/AIDS and human trafficking prevention program; KEXIM = Export-Import Bank of Korea.

4. Project Schedule

<b>Item</b>	<b>Appraisal Estimate</b>	<b>Actual</b>
Date of contract with DDIS consultants	01 Jan 2011	6 Apr 2011
Road asset management	01 Apr 2011	9 Jul 2012
Road safety program	01 Oct 2011	11 May 2012
HHTPP	01 Nov 2011	15 Dec 2011
Climate change adaptation	01 Nov 2011	11 Mar 2012
Completion of engineering designs	01 Mar 2011	6 Apr 2011
Civil works contract		
Date of award	01 Apr 2012	23 Dec 2011
Completion of work	30 Jun 2014	08 Apr 2015
Preparation of future project	01 Sep 2011	01 Jul 2012
Start of operations		
Completion of tests and commissioning	Not specified	08 Apr 2015
Beginning of start-up	Not specified	09 Apr 2015
Establishment social and environment office	01 April 2012	29 Mar 2012

DDIS = detailed design and implementation supervision; HHTPP = HIV/AIDS and human trafficking prevention program.

## 5. Project Performance Report Ratings

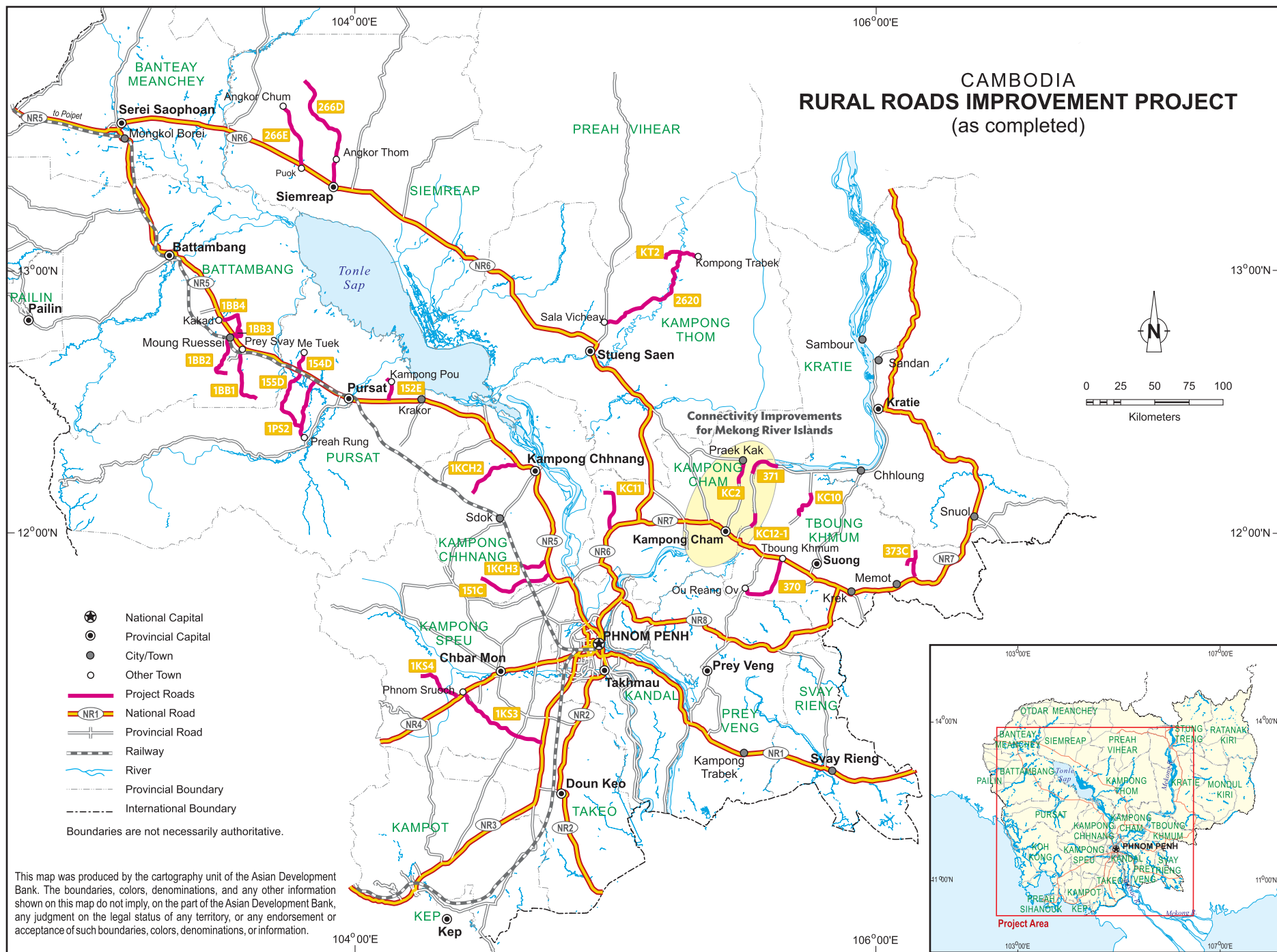
Implementation Period	Ratings
	Implementation Progress
From 5 April 2011 to 30 June 2011	potential problem
From 1 July 2011 to 31 December 2011	actual problem
From 1 January 2012 to 30 June 2016	on track

## D. Data on Asian Development Bank Missions

Name of Mission	Date	No. of Persons	No. of Person-Days	Specialization of Members <sup>a</sup>
Fact-Finding	8–18 Jan 2010	6	66	t, s, a, e, f, p
Inception	25–29 Apr 2011	2	10	t, a
Loan Review	22–30 Jun 2011	2	18	t, a
Loan Review	1–5 Dec 2011	2	10	t, a
Loan Review	27 Feb–2 Mar 2012	2	10	t, a
Loan Review	28 Sep–5 Oct 2012	3	24	t, s, a
Midterm Review	18–26 Feb 2013	4	32	t, s, a, e
Loan Review	17–25 Sept 2013	3	24	t, s, a
Gender Action Review	11–15 Nov 2013	1	4	t
Loan Review	3–10 Feb 2014	2	16	t, a
Loan Review	25 Nov–3 Dec 2014	4	32	t, s, a, e
Loan Review	23 Feb–2 Mar 2015	3	24	t, a, e
Loan Review	19–22 May 2015	1	4	t
Loan Review	7–11 Dec 2015	3	15	t, a, e
Loan Review	8–12 Aug 2016	3	15	t, a
Project Completion Review	25 Nov–1 Dec 2016	3	21	t, a

<sup>a</sup> a = associate project analyst, e = environment specialist, f = financial analysis specialist, p = project implementation officer, s = social development specialist, t = transport specialist.





## I. PROJECT DESCRIPTION

1. Road transport is the principal mode of transport in Cambodia. As of 2010, the road network of about 39,400 kilometers (km) included (i) about 4,800 km of national roads (primary national highways), (ii) about 6,600 km of provincial roads (secondary national highways), and (iii) about 28,000 km of rural roads. The Ministry of Public Works and Transport manages the national and provincial roads, while the Ministry of Rural Development (MRD) manages the rural roads.

2. By the early 1990s, after several years of civil war, the country's road network had severely deteriorated. Since 1992, with assistance from the Asian Development Bank (ADB) and other multilateral and bilateral development partners, the government focused on rehabilitating the core national infrastructure required for the economy to develop in a sustainable manner. As of 2010, development efforts brought the paved national and provincial road network to about 2,700 km in length, or about 23.7% of the total national and provincial road network. Meanwhile, the rural road network needed further improvement. The rural roads had deteriorated due to the steady growth in traffic, lack of maintenance financing, poor road maintenance standards, contractor capacity, and design and construction deficiencies.

3. With rapid economic development, overloaded cargo vehicles became a severe cause of road damage. This was also a significant issue for rural roads because trucks that hauled agricultural products and quarry materials tended to be overloaded. Further, Cambodia had one of the highest incidences of road accidents in the world with 18 fatalities per 10,000 vehicles in 2007. Deteriorating road safety was a major concern, especially with the increasing growth of traffic in rural areas. In addition, the need to address climate change considerations was essential given that Cambodia faces frequent flooding during the wet season.

4. In September 2010, at the request of the government, ADB approved a loan of special drawings rights (SDR) of 23.134 million (\$35 million equivalent) for the Rural Roads Improvement Project (RRIP).<sup>1</sup> The project also included the output to be funded through collaborative cofinancing (not administered by ADB) from the Export–Import Bank of Korea (KEXIM) with a \$21 million loan and the Nordic Development Fund (NDF) with a grant of €4.2 million (\$5.4 million equivalent).

5. The project was designed to improve the rural road network in seven provinces in Cambodia mainly around the Tonle Sap basin. The seven provinces were Battambang, Kampong Cham, Kampong Chhnang, Kampong Speu, Kampong Thom, Pursat, and Siem Reap.<sup>2</sup> The expected project impact was to improve access to markets, jobs, and social services in the seven provinces. The expected project outcome was safe, cost effective, all-year road access provided in remote agricultural areas in the seven provinces.

6. At appraisal, the project's planned outputs were: (i) project roads rehabilitated (505.4 km), (ii) improved MRD road asset management, (iii) increased road safety and awareness of potential social problems, (iv) reduced vulnerability of project roads to climate change, and (v) efficient project management.

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<sup>1</sup> ADB. 2010. *Report and Recommendation of the President to the Board of Directors on the Proposed Loan to the Kingdom of Cambodia for the Rural Roads Improvement Project*. Manila.

<sup>2</sup> The government divided Kampong Cham Province into two provinces, Kampong Cham and Tboung Khmum in 2014.

## II. DESIGN AND IMPLEMENTATION

### A. Project Design and Formulation

7. The government's Rectangular Strategy for Growth, Employment, Equity, and Efficiency, Phase II, for 2009–2013 emphasized generating economic growth through the rehabilitation and development of the country's physical infrastructure.<sup>3</sup> ADB's country partnership strategy for Cambodia supported ADB's overall strategy for poverty reduction through broad-based growth, inclusive social development, and stronger governance for sustainable development.<sup>4</sup> The project was included in the country operations business plan 2009–2012 for Cambodia.<sup>5</sup>

8. The project design of improving Cambodia's rural road network aligned fully with the government development priorities and ADB's country strategies for the following reasons. First, the project contributed directly to increasing the length of rehabilitated road infrastructure. Second, the rehabilitation of rural roads in the project benefited about 560,000 people by providing reliable, all-year road access from provincial towns and rural agricultural areas to markets, employment centers, and social services. Third, the outputs of the project related to rural road asset management, road safety, and social programs enhanced sustainable rural development. The choice of the modality, the project loan, was sound considering the size and duration of the project. Formulation of the project design was adequate and had the executing agency's strong ownership. Following the project, the RRIP II was designed with a similar project scope for an extended geographical area based on the success in the design of the project.

### B. Project Outputs<sup>6</sup>

#### 1. Output 1. Project roads rehabilitated

9. At completion, 545.3 km of rural roads had been rehabilitated against the planned length of 505.4 km at appraisal.<sup>7</sup> At completion, the project roads were located in eight provinces, namely, Battambang, Kampong Cham, Kampong Chhnang, Kampong Speu, Kampong Thom, Pursat, Siem Reap, and Tboung Khmum. The number of provinces increased from seven at appraisal to eight at completion because the government divided Kampong Cham Province into two provinces (Kampong Cham and Tboung Khmum) in 2014. Those eight provinces cover not only the Tonle Sap region but also the south-west and north-east areas of Phnom Penh. Unpaved laterite or dirt roads were rehabilitated into roads with a double bituminous surface treatment. The detailed design and implementation supervision (DDIS) consultants ensured the quality of the rehabilitated roads and no quality-related problems were found during the defects liability period.

10. At completion, 158,000 labor days for unskilled work were completed, of which women claimed 49,770 labor days (31.5%). Given the target at appraisal was 1 million person-days of local unskilled wage labor created for road rehabilitation and maintenance (with 40% for women workers), the target was not achieved.

<sup>3</sup> Government of Cambodia. 2008. *Rectangular Strategy for Growth, Employment, Equity and Efficiency: Phase II*. Phnom Penh.

<sup>4</sup> ADB. 2005. *Country Strategy and Program: Cambodia, 2005–2009*. Manila.

<sup>5</sup> ADB. 2009. *Country Operations Business Plan: Cambodia, 2009–2012*. Manila.

<sup>6</sup> Design and Monitoring Framework (Appendix 1).

<sup>7</sup> The three additional roads in Kampong Cham province were financed from loan savings of about \$3.7 million by utilizing contingency. ADB approved these changes through a minor change in project scope on 30 April 2013. ADB approved the three new contracts on 16 January 2014.

## **2. Output 2. Improved Ministry of Rural Development road asset management**

11. Output 2 included four performance indicators and targets. First, violations of overloaded trucks in the project provinces were planned to be reduced by 40% from 2011 to 2015. This target was achieved: overload trucks reduced by 50% mainly by the installation of overload control gates. Second, the average roughness of project roads in 2011 was to be decreased from 6–14 to 2–3 in 2015. This target was achieved: average roughness for improved roads decreased to 2–3 by 2016. Third, the annual operation and maintenance budget for project roads was expected to be increased from \$275 per km in 2010 to \$300 per km in 2015. The target was achieved: the annual maintenance budget for project roads was \$320 per km in 2015.<sup>8</sup> Fourth, the number of small-scale contractors in the project provinces accredited by the MRD was to be increased from 0 in 2010 to 10 in 2015. This target will likely be achieved as MRD collected contractors' data and at least 10 contractors will be accredited by 2019 though no contractors have been accredited by the time when the Project Completion Report is prepared.

## **3. Output 3. Increased road safety and awareness of potential social problems**

12. Output 3 included two performance indicators and targets. First, 40% of project beneficiaries in the seven provinces and all contractors' personnel were to participate in an HIV/AIDS and human trafficking prevention program (HHTPP) before and during civil works construction, by 2014. This target was achieved: HHTPP training was completed successfully with participation by 52% of project beneficiaries before and during civil works construction. Second, sex-disaggregated baseline socioeconomic data was established by 2011 as planned.

## **4. Output 4. Climate change adaptation**

13. Output 4 had one performance indicator and target; that all residents at risk are evacuated within 72 hours after a typhoon occurs in the pilot province for emergency management, from 2015 onwards. The target was achieved as the project developed an emergency management system (EMS) for rural roads and constructed one emergency operation center and three shelters in the most vulnerable location in Kampong Thom Province, the pilot province, in 2017, to which all residents at risk can be evacuated within 72 hours after a typhoon occurs.<sup>9</sup>

## **5. Output 5. Efficient project management**

14. Output 5 included three performance indicators and targets. First, the project management unit (PMU) personnel was to increase from 12 in 2010 to 22 in 2013. This target was achieved as PMU personnel increased to 22 by 2013. Second, all staff from the PMU and MRD's Social and Environmental Office (SEO) would participate in training on social and gender issues, by 2012. This target was achieved as the training was conducted from 2012 and onwards for targeted staff. Third, at least 25% of the newly established MRD SEO staff to be female, by 2012. This target was achieved as SEO has 43% women staff by 2012.

## **C. Project Costs and Financing**

15. At appraisal, the project was estimated to cost \$67.0 million. At completion, the cost was

<sup>8</sup> The annual maintenance budget for project roads includes routine maintenance and does not include periodic maintenance. Although the target was achieved, the increase was not sufficient considering the inflation rate during 2010–2015 because \$320 in 2015 is almost the same value as \$275 in 2010 in real terms.

<sup>9</sup> Among the 8,000 population of the pilot area, 4,000 is estimated to evacuate to the shelters. The target evacuation time was set considering previous typhoon experience.

\$65.6 million, \$1.4 million less than the appraisal estimate. The actual cost for the civil works for the improvement of roads was \$49.5 million, \$10.2 million above the appraisal estimate of \$39.3 million because of the increase in the scope of the civil works, with four civil works packages added during the implementation. Contingency funds were used to compensate for this increase. The actual cost for consulting services for construction supervision was \$6.7 million, \$1.4 million higher than the appraisal estimate, caused by the time extension of the civil works and additional road improvement contract packages that required supervision. The actual cost for the incremental administration cost decreased from \$2.0 million at the appraisal estimate to \$0.9 million at completion. The decrease was due to less use of project management, equipment, and priority operations. Appendix 2 indicates the comparison of project cost at appraisal and actual.

16. The financiers included ADB, KEXIM, NDF, and the government. KEXIM and NDF provided collaborative cofinancing without ADB administration. Although normally the project scope excludes the components financed by collaborative cofinancing, the report and recommendation of the President to the Board of Directors (footnote 1) included those components in the project scope because they were integral to the delivery of whole project outputs. At appraisal, the ADB loan was intended to be used for civil works, related consulting services, equipment, project management, and interest during construction, totaling \$35.0 million. At completion, the ADB loan was used for the planned purposes, and the amount was \$33.6 million. KEXIM was envisaged to finance part of the civil works and related consulting services through a \$19.4 million loan. At completion, KEXIM finance was \$21.0 million. KEXIM provided a tied-loan. The NDF planned to finance the climate change adaptation output through a €4.2 million (equivalent to \$5.4 million) grant at appraisal. At completion, \$4.3 million of the grant was used due to the exchange rate fluctuation. At appraisal, the government was to provide \$7.3 million of counterpart funding, to be allocated for taxes, duties, and priority operation cost. At completion, the government had funded \$6.8 million. The project costs at appraisal and at completion are indicated in Appendix 3.

#### **D. Disbursements**

17. The loan was disbursed slightly slower than projected due to the delay in the selection of detailed design and implementation supervision (DDIS) consultants and the delay of construction progress of one of the civil works contracts (CW-C). The advance account and statement of expenditure procedures were utilized for amounts of less than \$100,000 for local expenditures for training and incremental administrative expenditures and small-amount disbursements. The use of an advance account facilitated the project implementation by reducing the number of withdrawal applications. Disbursements from the loan account were completed on 21 October 2016, which was 4 months after the loan closing date. The disbursement of ADB loan and grant proceeds is in Appendix 4, and the graph of projection and cumulative disbursement of the ADB loan proceeds is in Appendix 5.

#### **E. Project Schedule**

18. At appraisal, the project was expected to be implemented over 5 years, from January 2011 to December 2015. The project was completed as originally scheduled. Advance action in procurement contributed to the on-time implementation. The PMU and DDIS consultants performed well to supervise contractors for the on-time completion of the project. There was no delay in the KEXIM financing components, while the NDF output (climate change adaptation) was completed in November 2017, which was 23 months after the loan completion of ADB's financing. The NDF's climate change adaptation output was extended to utilize all grant for the project's purpose, especially for the delivery of green planting and construction of ponds. However, this

delay did not cause any negative impact on the overall project implementation.

## **F. Implementation Arrangements**

19. The implementation arrangements were appropriate. The MRD served as the executing agency responsible for overall project implementation. Under the MRD, there are provincial departments of rural development (PDRD), which are in charge of road maintenance. To implement the project, the MRD established the PMU under the General Directorate of Technical Affairs. Overall control of the project outputs was the responsibility of the PMU. There were 22 staff members within the PMU over the course of implementation. The organizational structure of the PMU is in Appendix 6.

20. The MRD established the SEO with assistance from the project's consultants in the third quarter of 2011 after (i) consultations with the PMU and MRD's departments, including the Gender Technical Working Group; (ii) preparation of a concept paper and proposed organizational structure for the establishment of the SEO; (iii) discussion with the PMU on the concept paper for comment, improvement, and approval; and (iv) identification of key MRD officers from the Rural Roads Department as potential officers for the newly established SEO. The Secretary of State of the Civil Service agreed on 19 March 2012 to the nominations and entrusted the task to the chief and deputy chief for the new office of SEO in the MRD. The Minister for Rural Development appointed the chief and the deputy chief of SEO on 29 March 2012. The MRD recruited additional staff for the SEO in September 2012 for safeguards monitoring and training. All seven proposed positions have been filled. Of the seven SEO staff, three are female. The SEO is now composed of two social and gender officers, two environment officers, one resettlement officer, one chief, and one deputy chief. The SEO contributed to the implementation of output 3; increased road safety and awareness of potential social problems.

## **G. Technical Assistance**

21. ADB-financed project preparatory technical assistance (TA) of \$500,000 equivalent was provided on a grant basis from ADB's Japan Special Fund to help the government assess the project's technical, environmental, financial, economic, social, and institutional feasibility.<sup>10</sup> The TA helped the government review and strengthen the feasibility study, the environmental impact assessment, and the resettlement framework to strengthen the requirements for ADB financing of the project. The TA started in December 2008 and was completed in December 2010. The performance of the TA consultants was *satisfactory*.

## **H. Consultant Recruitment and Procurement**

22. Four consulting service packages were planned for the project: (i) DDIS consulting services, (ii) road asset management program, (iii) road safety program, and (iv) HHTPP. Packaging in the procurement plan was sound, and recruitment procedure for those packages was conducted in line with ADB's procurement policy. For the DDIS consulting service and HHTPP, consultants provided the executing agency with satisfactory supports and outputs. Initial delays in consulting delivery for the road safety program and the road asset management program were addressed with help from ADB and MRD.

23. ADB administered six civil work packages. Two packages (CW-B and CW-C), which were awarded in November 2011, were originally planned civil works packages to improve 13 roads,

<sup>10</sup> ADB. 2010. *Preparing the Provincial/Rural Road Asset Management Project, Final Report*. Manila.

and three packages (CW-D, CW-E, and CW-F), which were awarded in January 2014, were additionally planned civil works packages to improve three roads.<sup>11</sup> In addition, there was one minor civil works package for road safety (CW-G). Packaging in the procurement plan was sound, and procurement procedure for those packages was conducted in line with ADB's procurement policy. Overall quality of work was satisfactory to the executing agency. Meanwhile, the progress of CW-C was slow due to a serious financial problem of the contractor. After a 10-month extension, the contractor completed the work to the required quality.

## I. Gender Equity

24. The project was categorized as effective gender mainstreaming. The Gender Action Plan (GAP) design was highly relevant in addressing practical and strategic gender benefits to the overall success of the project. The implementation of the GAP is rated *successful* with 93% of actions (13 of 14 actions) implemented and completed, and 75% of targets (three of four targets) achieved. Details of the achievements under the GAP are in Appendix 12.

25. Improved roads have provided better economic and livelihood opportunities for the local people, including opening new shops, gas stations, small businesses (or stalls), and markets located along the roads, which are mainly operated by women. Both men and women are provided with faster and easier access to markets, health care services, education, and production sites with a reduction in time and cost. Road shoulders are designed with sealed surfaces to enable carts with wheels to reduce the burden on women and girls. The project's rapid assessment of gender impact confirms women's income has almost doubled after the road improvements. The project generated 49,770 labor days (31.5%) for women out of a total of 158,000. This effort has been made through gender sensitization on promoting women's access to jobs in rural construction and maintenance with all concerned parties. It also contributed directly to the increase in economic benefits. Women experienced positive changes in shifting gender roles and increasing women's participation in decision making. To ensure maximized positive impact for women, the project created opportunities and spaces for women to articulate their concerns and interests during project implementation freely.

26. The project has contributed to transformative changes in gender relations and job creation for women in road construction, a male-dominated sector. The interventions on promoting women's access to jobs in road construction reached and trained 750 villagers, six contractors, 17 local authorities, and 100 MRD staff through social media, community outreach, and training on the equal role of women in road construction. Women have become aware of available jobs in road construction and contractors are more open-minded about recruiting more women. The SEO was established in the MRD and qualified as a governmental body in addressing key cross-cutting issues including safeguards and gender. The SEO has seven staff of whom three are women (43%), demonstrating a good practice of equal women participation. The SEO received training and guidance about their functions relevant to safeguards and gender mainstreaming, monitoring, and preparation of reports (with sex-disaggregated data), which they are expected to continue in their work in the MRD.

27. The project also promoted women's agency by building the capacity of 351 women to work as facilitators to deliver a community-based road safety campaign, where women have increased their visibility in community work. These led to an increase in their confidence and they have gained community respect, which contributed to the overall benefit in their daily lives. The project

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<sup>11</sup> Other than those packages, KEXIM administered the CW-A civil work package to improve the roads under its component.

ensured that there is no potential downside impact of road corridors by implementing the HHTPP. The HHTPP was implemented with the local communities, contractors, and labor force in the project areas before and during civil works and/or construction stage. Training on HHTPP was provided to (i) 26,446 members of the general population, of whom 49% (12,945) were women; (ii) 2,482 construction workers of whom 20% (497) were women; (iii) 1,654 truck drivers and porters of whom 145 (9%) were women; and (iv) 1,507 entertainment workers (all women). Of the 13,069 adult community residents that reported the correct and consistent use of condoms, 37.2% (4,860) were women. A total of 574 construction workers received confidential, voluntary counseling and testing for HIV/AIDS of whom 31.3% (180) were women.

## **J. Climate Change Adaptation**

28. In the context of ADB's Sustainable Transport Initiative and commitment towards addressing climate change in its Strategy 2020, ADB had been implementing pilot projects to develop knowledge and replicable models in developing member countries on how to climate proof transport projects and programs.<sup>12</sup> The project represents one of those case studies and the only one in Southeast Asia. The aim was to incorporate concerns about climate change impacts into project design to reduce the damages caused to planned and existing transport infrastructure and affected areas. The proposed adaptation strategy, therefore, included a combination of engineering, non-engineering and planning activities to manage the changes observed and predicted in the project area. The vulnerability mapping was carried out to detail the phases expected to be followed to provide the MRD with a country-wide analysis of future flood risk in Cambodia. The green planting program started in 2013, and planting activities started on 3 October 2014. The contract period was extended twice and ended on 29 April 2016. A total of 7,592 trees have been planted out of 15,682 planned. In addition, 19 ponds were constructed according to the initial proposal of flood black spot improvements and water retention and evacuation ponds in the provinces of Kampong Speu, Kampong Thom, and Tboung Khmum. The pond construction started in November 2015 and was completed in July 2017 with a total cost of \$1,084 million. As for an EMS, the project built the Emergency Operations Center in Cheu Teal Commune, in Sandan District, and refurbish an office with equipment for the Emergency Information Centre at the Provincial Department of Rural Development (PDRD) in Kampong Thom Province. In addition, the project established three flood shelters in the villages of Ang Doung Pring, Cheu Teal, and Kai Raing. The official inauguration of the EMS installations was held at An Doung Pring shelter, Sandan District, Kampong Thom, on 23 November 2017.

## **K. Safeguards**

### **1. Environmental Impact**

29. The project was classified environment category B at appraisal. An initial environmental examination (IEE) was undertaken during project preparation, which concluded that the environmental impacts of the project components during construction and operation would be manageable, localized, and temporary. In June 2013, the MRD submitted an updated IEE and environmental management plan (EMP) to ADB to include three roads in Kampong Cham province (footnote 7).

30. In terms of compliance with national environmental laws, an environmental assessment is not required for rural roads if these are not located in protected areas. Since the existing roads

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<sup>12</sup> ADB. 2010. *Sustainable Transport Initiative Operational Plan*. Manila; and ADB. 2008. *Strategy 2020: Working for an Asia and Pacific Free of Poverty*. Manila.



traverse culturally significant sites, such as the Angkor Protected Landscape, the Prasat Sambour Preikuk Temple Ruins, and the transition zone of the Tonle Sap Biosphere Reserve, the MRD coordinated with the relevant management agencies such as the Authority for Protection and Management of Angkor and the Region of Siem Reap, and the Ministry of Culture and Fine Arts. Both agencies issued official letters indicating support for the project. In addition, the PMU submitted copies of environmental permits of all the commercial quarries and crushing plants that were being utilized for the project to ADB as part of the semi-annual monitoring report prepared in 2013.

31. The civil works contract documents included an EMP to be implemented during construction by the contractors. Each contractor prepared the contractor's environment management plan, which the DDIS consultants and ADB found to be satisfactory. The DDIS consultants checked and monitored the performance of contractors monthly by using the environment checklist of the EMP. Major issues during monitoring included (i) air pollution during road construction, (ii) insufficient traffic control measures to minimize accidents during construction, (iii) control of borrow pits' slopes for the subbase, (iv) erosion of embankments, and (v) oil spill and debris from construction residuals.

32. At the initial stage of project implementation, there were some environmental issues that needed remedial actions by the contractors. Outstanding issues were followed up by the DDIS and PMU/SEO, which resulted in the overall satisfactory implementation of environmental mitigation measures. The project carried out public consultation including coordination with locals. In general, the local people disclosed that completed roads reduced dust pollution in the vicinity as compared to pre-project situation with unpaved roads. The environmental condition along the newly paved roads improved after the completion of the project: (i) there was no more dust on the roof of houses and the color of trees and plants changed from brown to green, and (ii) there was no stagnation of water on the roads after rains. Detailed descriptions of the environmental safeguards are in Appendix 7.

## **2. Social safeguards**

33. The project was classified category B for involuntary resettlement under ADB's Safeguard Policy Statement (2009) at appraisal. The project was designed to avoid any form of resettlement impacts as the improvement has been limited to pave existing roads within available width. The MRD prepared a resettlement framework for the temporary impacts during construction, which was agreed by ADB and the Ministry of Economy and Finance (MEF) on 5 March 2010. The resettlement framework was strictly applied. During the implementation of civil works, the MRD conducted two due diligence surveys for the verification of voluntary donation for such special cases as protecting a section of the project road from gradual river erosion. No resettlement issues were found for those land donations through negotiated settlement. A detailed description of the social safeguards (resettlement) is in Appendix 8.

34. The project was classified category B for indigenous peoples under ADB's Safeguard Policy Statement (2009) at appraisal. It was envisaged that there would be no or limited impacts on indigenous groups, and indigenous peoples' specific actions were included in the resettlement framework. During implementation of civil works, existence of indigenous peoples and culture were monitored and confirmed through periodic social safeguard monitoring, such as semi-annual environment monitoring. No indigenous peoples or their specific culture was observed during implementation. Consequently, there was no impact on indigenous peoples and groups from the project.

35. A grievance redress mechanism has been prepared and used for solving grievances. Upon completion of the project, there was no grievance unsolved.

## **L. Monitoring and Reporting**

36. The MRD had complied with all covenants of the loan agreement except for two partially-complied covenants regarding the audited financial statements (para. 38) and the labor and gender action plan. However, those partial compliance did not impact the overall performance of the project. Three covenants were complied with but delayed for 15 months due to government procedures, i.e., approval in MRD and the subsequent submission of the Council of Ministers of (i) rural road policy, (ii) sub-decree on road right of way, and (iii) sub-decree on axle load control, although those delays did not impact the overall performance of the project. Details of compliance with the covenants under the loan are in Appendix 10.

37. Reporting requirements of the project were complied with. The DDIS consultants conducted a baseline socio-economic survey in 2011, completed the socioeconomic survey in 2016, and submitted the reports on time. The socioeconomic impact of the project is in Appendix 9. With support from the DDIS consultants, the MRD prepared and submitted to ADB the monthly and quarterly reports, and the completion report in a timely manner.

38. Audited project financial statements were submitted to ADB, albeit with some delays in 2011–2015.<sup>13</sup> There was no delay in FY 2016.

## **III. EVALUATION OF PERFORMANCE**

### **A. Relevance**

39. The project is *highly relevant* to the government's objectives and policies, as well as to ADB's country strategies, both during appraisal and at project completion. The project's objective of improving access to markets, jobs, women's empowerment, and social services in the project provinces are aligned with (i) the government's national strategy of growth, employment, equity, and efficiency and (ii) ADB's country strategies (paras. 7 and 8). The project was particularly relevant in the context of the strategic development needs around the Tonle Sap Basin and to reduce poverty by providing all-year, all-weather roads in one of the country's poorest region. The choice of the modality was sound, and the design of design and monitoring framework was appropriate. The project rehabilitated rural roads and also helped the MRD improve rural road construction and maintenance practices through knowledge transfer in road asset management, road safety, and social issues. This knowledge transfer became a model for the interventions of ADB and other development partners in the development of rural roads; the RRIP II was designed with a similar project scope for extended geographical areas based on the success in the design of the project.

### **B. Effectiveness**

40. The project is rated *effective* in achieving its outcomes and outputs. The primary purpose of the project, which was to rehabilitate the rural roads to a paved condition in order to improve

<sup>13</sup> Per Section 4.02 of the Loan Agreement, the Borrower shall furnish ADB an additional auditor's opinion on (i) the use of loan proceeds; (ii) compliance with financial covenants; and (iii) use of procedures for imprest account and statement of expenditures. However, the audited project financial statements submitted for the project did not include this additional auditor's opinion. Note that the item (iii) is not required for all projects that commence fact-finding on or after 15 October 2015.

the rural poor's access to markets and social services, was achieved. All four outcome indicators were achieved, namely (i) decrease in the road accidents in the project area, (ii) decrease in average travel time on project roads, (iii) increase in the share of the rural road network in average or good condition, and (iv) increase in the average number of days per year that the project roads are accessible. Ten out of 12 outputs indicators have been achieved, one output indicator was not achieved, and one output indicator was likely to be achieved (paras. 9–14).

41. The implementation of the GAP was rated as *successful* (para. 24). Although one gender target in the design and monitoring framework has not been achieved, the improved roads brought positive social impacts to women (para. 25) and contributed to transformative changes in gender relations and job creation for women in road construction, a male-dominated sector (para. 26). The project was designed as one of the pilot projects to develop knowledge and replicable models in developing member countries on how to climate-proof transport projects and programs. This aim of the climate change adaptation was fully addressed in the project at completion (para. 28).

### C. Efficiency

42. The project is rated *efficient* given its economic viability and overall schedule of completion. The economic internal rate of return (EIRR) for all 23 project roads was recalculated as 38.1%, which is well above the target rate of 12%, and higher than that at appraisal (32.0%).<sup>14</sup> The actual increase in traffic volume upon completion of civil works was higher than originally forecasted. The EIRR is most sensitive to variations in traffic, either base year traffic or the traffic growth rate, however, either of these would have to decrease by almost 70% for the project to become unviable. Risk analysis shows that the likelihood of the project not reaching an EIRR of 12% is less than 1%. Appendix 11 shows the updated economic evaluation at completion.

43. There was no delay in the project for ADB's and KEXIM's financing components. Although the NDF output was completed in November 2017, which was 23 months after the loan completion of ADB financing, this delay did not bring any negative impacts to the overall project implementation (para. 18).

### D. Sustainability

44. The sustainability of the project is rated *less than likely sustainable*. Since the project does not generate its own revenue, the financial analysis focused on the financial sustainability of the executing agency. The type of pavement for the project road is a double bituminous surface treatment (DBST), which is more durable in maintenance than unpaved laterite road. The DBST lasts longer and needs less periodic maintenance cost than laterite roads. On the other hand, early repair of road damages such as cracks and potholes are necessary for a DBST road to maintain the life of the pavement. Although the annual operation and maintenance budget for project roads increased from \$275 per km in 2010 to \$320 per km in 2015, the increase was not sufficient considering the inflation rate during that period. Also, the government financing of the maintenance requirement for the rural road network was limited to 70.6% in 2015.

45. By the installation of overload control gates in the project, overloaded trucks in the project provinces reduced by 50%, against a target of 40%. This would contribute to savings in the maintenance costs. The roads were equipped with safety facilities such as guardrails, traffic signs

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<sup>14</sup> For EIRR calculation, the target rate of 12% was used at appraisal. Currently ADB uses the target rate of 9% (6% for poverty-targeting projects).

and school safety zones, which were implemented for the first time in Cambodia. Those would ensure a sustainable use of roads in terms of safety. From the institutional point of view, the project management skills of the MRD, including SEO, staff was strengthened. This would ensure the institutional sustainability to implement other projects to be financed by ADB and other development partners after the project. In addition, the development of the project roads was in line with climate change adaptation, which will ensure their environmental sustainability.

## **E. Development Impact**

46. The development impact of the project is rated *highly satisfactory* with significant social impacts. A total of 1,015 respondents participated in the baseline social survey, conducted in August 2011. The completion survey was conducted in early March 2016. Most respondents to the post-completion survey indicated that village life, in general, had improved in the previous 4.5 years. The project had provided significant social benefits, resulting from the reduction in travel times, as well as the convenient and reliable road conditions due to the provision of paved roads. The most appreciated advantage of the project was the availability of transport means and reliable access to villages at any time of the year. The detailed socioeconomic impacts are in Appendix 9.

## **F. Performance of the Borrower and Executing Agency**

47. The performance of the borrower and the executing agency is rated *satisfactory*. The PMU of the MRD had overall responsibility for the project implementation. The release of counterpart funds was made in a timely manner, and there was not one complaint from the contractors. The disbursement of certified payment was done quickly in the MRD and submitted to the Ministry of Economy and Finance (MEF). Most disbursements were paid on the due date specified in the contract. The PMU was responsible for the day-to-day control of the output and selection of consultants and bidding of civil works. The PMU effectively managed the budget and financial control, and the physical implementation of the project with the assistance of the DDIS consultants. Although the implementation of a part of the civil works package was delayed, the quality of the completed work was highly satisfactory. The MRD has complied with most of the loan covenants.

48. The project procurement-related review report (PPRR), issued in September 2016, pointed out issues related to the procurement (quality of bid evaluation) and asset management (off-specification).<sup>15</sup> For procurement, the PPRR indicated issues related to the evaluation of financial capacity. Although misprocurement was not identified due to this issue, ADB's prior review and MEF's procurement oversight have been provided to mitigate the risk related to the bid evaluation. For asset management, the PPRR noted that the construction and installation of guideposts did not comply with approved specifications. The MRD already fixed this issue. The follow-up review of the PPRR, conducted in July 2017, indicated that the MRD made significant progress in implementing the recommendations, though it indicated that the procurement issue was still only partially complied with.<sup>16</sup> The risk mitigation measures for procurement have been applied in the RRIP II.

## **G. Performance of Cofinanciers**

49. The project was cofinanced with KEXIM for part of the civil works and with the NDF for

<sup>15</sup> ADB. 2016. *Project Procurement-Related Review, Loan 2670-CAM: Rural Roads Improvement Project and Loan 3151-CAM(SF) and Grant 0401-CAM: Rural Roads Improvement Project II*. Manila.

<sup>16</sup> ADB. 2017. *Follow-up Review of the Implementation of Project Procurement-related Review Recommendations, Loan 2670-CAM: Rural Roads Improvement Project and Loan 3151-CAM(COL) and Grant 0401-CAM: Rural Roads Improvement Project II*. Manila.

climate change adaptation. Cofinanciers were useful in achieving the agreed objectives and results and promoting project sustainability. The cofinanciers worked collaboratively, communicated effectively with ADB, MRD and other stakeholders, and responded effectively to emerging issues. Implementation went well, and disbursement was done smoothly. Cofinanciers operated in a manner consistent with ADB policies and priorities, effectively managing risk, fraud, and corruption. With the satisfactory implementation of the project, both KEXIM and the NDF later continued to support the RRIP II along with other donors.

## H. Performance of the Asian Development Bank

50. The performance of ADB was rated *highly satisfactory*. ADB's Transport and Communication Division of the Southeast Asia Department handled the project and supported the executing agency during the implementation period by direct monitoring of the project. ADB conducted a total of 14 loan review missions, including an inception mission, three special missions, a midterm review mission and a project completion review mission. Representatives from KEXIM and the NDF participated in the missions. Three special missions focused on the gender action plan, soft output progress review, and safeguard compliance during the civil works construction period. Loan review missions included inspections to the project site and to the PMU headquarters in Phnom Penh, where kick-off meetings and wrap-up meetings were held. The role performed by the ADB missions included advice on technical issues, preparation and evaluation of bid documents, social safeguards issues, reallocation of loan proceeds, and disbursement. ADB missions provided extensive support in areas such as road asset management and road safety programs. ADB managed the overall project budget in coordination with the MRD and MEF.

## I. Overall Assessment

51. Based on the assessments of components, the project was rated *successful*. For relevance, the project design aligned fully with those government development priorities and ADB's country strategies. For effectiveness, all the four outcome indicators were achieved. The gender aspect was fully achieved in the project at completion as designed. For efficiency, economic validity is high for the project. There was no delay in the project for ADB financing components. For sustainability, the paved road with double bituminous surface treatment (DBST) is more durable in maintenance than an unpaved road. However, the operation and maintenance budget amount was yet to be sufficient. The table below shows the assessment of each item and the overall project ratings.

OVERALL RATINGS	
Criteria	Rating
Relevance	Highly relevant
Effectiveness	Effective
Efficiency	Efficient
Sustainability	Less than likely sustainable
<b>Overall Assessment</b>	Successful
Development impact	Highly satisfactory
Borrower and executing agency	Satisfactory
Performance of ADB	Highly satisfactory

ADB = Asian Development Bank.

Source: Asian Development Bank.

## **IV. ISSUES, LESSONS, AND RECOMMENDATIONS**

### **A. Issues and Lessons**

52. Initial delays in consulting delivery for the road safety program and the road asset management program were addressed with help from ADB and the executing agency (para. 22). The executing agency has been requested to obtain skills in road safety and road asset management programs due to their importance for the sustainability and success of the project. The executing agency is expected to gradually gain adequate capacity to implement future rural road development projects with minimal support from consultants.

53. In the project, safety school zones were constructed as a pilot scheme in Cambodia to protect school children and reduce traffic crash near schools. Out of 150 schools along the project roads, 25 schools with more than 500 students were selected for the scheme. The installation of safety school zone contributed to promoting participation in the campaign on rural road safety, and teachers and students of those schools became more interested in the importance of the road safety. The implementation of safety school zone was evaluated effective to reduce crash near schools and to promote participation of teachers, students, and the local community in road safety. This scheme should be continued in future road improvement projects.

54. A significant lesson gained from the project is the creation of employment opportunities for women in construction work and shifting entrenched perceptions on women's capacities. The RRIP—as a pioneer initiative for effective gender mainstreaming—actively pursued women's access to jobs in road construction, achieving 31.5% of the total labor days for women. It is important to set a realistic quantitative target for women's involvement in unskilled labor in infrastructure projects, considering all influencing factors such as reference information, current context, and other existing employment opportunities for women in the project areas. In addition, the establishment of the SEO has proven essential for this project but even more so for the sustainability of successful gender mainstreaming in other rural roads projects in Cambodia. The SEO acted as a focal among a well-coordinated and active project team including PMU, PDRDs, and DDIS consultants, ensuring that social and gender issues are adequately addressed during project implementation. Such favorable institutional arrangement should be considered in similar projects to ensure sustainability of the gender mainstreaming efforts beyond the project. Continuing to strengthen the capacity of SEO staff to fulfill its mandate will be important.

### **B. Recommendations**

55. The maintenance of project facilities is critical to the long-term success of the project roads (para. 44). The rapid increase in the levels of traffic since appraisal requires an adequate maintenance budget for the roads. While implementing the down-streaming projects (e.g., the RRIP II), ADB should regularly monitor the maintenance of the roads by analyzing the government's annual budget allocations and actual spending for routine and periodic maintenance of the paved roads. The effects of safety school zone should be monitored and evaluated for expansion to other locations, to cover more schools with safety school zone. More frequent field visits and monitoring by the SEO team are required for its effective operation and sustainability of the safety school zones.

56. Appropriate staffing at the PMU and close monitoring by ADB and MEF is needed for future projects to mitigate procurement risks (para. 48). Procurement capacity building initiatives should be prepared at the start of the project implementation as part of the project start-up activities.

57. **Further action or follow-up.** Maintenance of the project roads must be a priority, so the assets will continue to be used by rural inhabitants and contribute to the social, agricultural, and economic growth of the areas. Funds must be made available for timely and effective implementation of road maintenance to ensure the sustainability of road assets.

58. **Timing of the project performance evaluation report preparation.** A project performance evaluation should be undertaken in 2021 to determine whether the project is still meeting its objectives.

## DESIGN & MONITORING FRAMEWORK

<b>Design Summary</b>	<b>Performance Indicators/Targets</b>	<b>Data Sources and/or Reporting Mechanisms</b>	<b>Project Achievement</b>
<b>Impact</b> Improved access to markets, jobs, and social services in seven project provinces	<p>Volume of agricultural products transported on project roads increases by 100% from 2011 to 2018</p> <p>By 2018, in the project provinces:</p> <ul style="list-style-type: none"> <li>(i) economic activity rate of 80% (ages 15–64, both sexes) increases to 85%</li> <li>(ii) child mortality rate of 83 deaths per 1,000 live births decreases to 50</li> <li>(iii) maternity mortality rate of 461 deaths per 100,000 live births decreases to 230</li> <li>(iv) rural girls' lower secondary net enrolment rate increases from 30.8% in school year 2009/2010 to 40%</li> </ul>	<p>National and regional statistics Field surveys</p> <p>Population census</p> <p>Health information system and Cambodia Demographic and Health Survey</p> <p>Education management information system</p>	<p><b>Achieved</b>  Volume of agricultural products transported on project roads increased by 120% from 2011 to 2016</p> <p>By 2016, in the project provinces:</p> <p><b>Achieved</b>  Economic activity rate of 80% (ages 15–64, both sexes) increased to 85%</p> <p><b>Achieved</b>  Child mortality rate of 83 deaths per 1,000 live births decreased to 29 deaths</p> <p><b>Achieved</b>  Maternity mortality rate of 461 deaths per 100,000 live births decreased to 161</p> <p><b>Achieved</b>  Rural girls' lower secondary net enrolment rate increased from 30.8 to 48%</p>
<b>Outcome</b> Safe, cost effective, all-year road access provided in remote agricultural areas in seven provinces of the Tonle Sap Basin	<p>Road accidents in the project area decrease by 20% from 2009 (5,610 accidents) to 2015</p> <p>Average travel times on project roads decrease by 25% from 2011 to 2015</p>	<p>National road safety action plan annual report</p> <p>Field traffic surveys</p>	<p><b>Achieved</b>  The road accidents decreased from 5,610 in 2009 to 4,353 accidents in 2013. (decreased by 23.1%).</p> <p><b>Achieved</b>  Average travel times on project roads decreased by 60% (due to travel speed from 25 km/h in 2011 to 40 km/h in 2015).</p>



Design Summary	Performance Indicators/Targets	Data Sources and/or Reporting Mechanisms	Project Achievement
	<p>Average trip lengths on project roads increase by 40% from 2011 to 2015</p> <p>Share of the rural road network in average or good condition increases from 17% in 2011 to 20% in 2014</p> <p>Average number of days per year that the project roads are accessible increases from 180–200 days in 2011 to 365 days in 2014.</p>	<p>Provincial and national trade statistics; MRD's annual reports</p> <p>MRD's annual reports</p>	<p>Average trip length was increased by 70% (from 2.0 km in 2011 to 3.4 km in 2015).</p> <p><b>Achieved</b> Share of the rural road network in average or good condition was 17% in 2011 and 21% in 2015.</p> <p><b>Achieved</b> All project roads have been accessible for 365 days.</p>
<p><b>Outputs</b></p> <p>1. Project roads rehabilitated</p> <p>2. Improved road asset management</p>	<p>505.4 km of rural roads rehabilitated by 2014</p> <p>At least 1 million person-days of local unskilled wage labor created for road rehabilitation and maintenance (with at least 40% for women workers) by 2014</p> <p>Violations of overloaded trucks in the project provinces are reduced by 40% from 2011 to 2015.</p> <p>Average roughness of project roads in 2011 decreases from 6–14 to 2–3 in 2015.</p> <p>Annual operation and maintenance budget for project roads increases from \$275 per km in 2010 to \$300 per km in 2015.</p> <p>The number of small-scale contractors in</p>	<p>Monthly and quarterly project progress reports</p> <p>Monitoring reports Project accounts Project review Missions</p> <p>MRD annual reports</p> <p>JICA Axle Load Control Program reports</p> <p>Quarterly progress reports and project completion report</p> <p>MRD annual reports</p> <p>MRD annual reports</p>	<p><b>Achieved</b> 545.3 km of rural roads rehabilitated by 2016</p> <p><b>Not achieved</b> 158,000 labor days for unskilled labor; 49,770 labor days (31.5%) claimed by women workers</p> <p><b>Achieved</b> By installation of overload control gates, overload trucks reduced by 50%</p> <p><b>Achieved</b> Average roughness for improved roads decreased to 2–3 in 2015</p> <p><b>Achieved</b> Annual maintenance budget for project roads was \$320 in 2015.</p> <p><b>Likely to be achieved</b> Contractor's data was</p>

Design Summary	Performance Indicators/Targets	Data Sources and/or Reporting Mechanisms	Project Achievement
	the project provinces accredited by MRD increases from 0 in 2010 to 10 in 2015.		collected and will be accredited by 2019.
3. Increased road safety and awareness of potential social Problems	40% of project beneficiaries in the seven provinces and all contractors' personnel participate in an HHTPP before and during civil works construction, by 2014.	Quarterly progress reports and project completion report	<b>Achieved</b> HHTPP training has been successfully completed with 52% participation of project beneficiaries during education.
	Sex-disaggregated baseline socioeconomic data established by 2011	Quarterly progress reports and project completion report	<b>Achieved</b> Baseline socioeconomic study was completed by 2011 and data was established.
4. Reduced vulnerability of project roads to climate change	All residents at risk are evacuated within 72 hours after a typhoon occurs in the pilot province for emergency management, 2015 onwards.	Quarterly progress reports and project completion report	<b>Achieved</b> Emergency Management System was developed for rural roads. As a pilot province, one emergency operation center and 3 shelters were constructed in the most vulnerable location in Kampong Thom Province in 2017. All residents at risk can be evacuated within 72 hours after a typhoon occurs.
5. Efficient project management	PMU personnel increased from 12 in 2010 to 22 in 2013	Quarterly progress reports	<b>Achieved</b> PMU personnel increased to 23 in 2013
	All PMU and MRD social and environmental unit staff participate in training on social and gender issues, by 2012.	Quarterly progress reports	<b>Achieved</b> Training was conducted in 2012 and onwards.
	At least 25% of the newly established MRD social and environmental unit staff are female, by 2012.	Quarterly progress reports	<b>Achieved</b> Percentage of women among the SEO was 43% by 2012.

Activities with Milestones		Date Achieved	Inputs	Actual Costs
1.	Road rehabilitation		1. Road rehabilitation:	
1.1	MRD selects detailed design and construction supervision consultants: by March 2011	April 2011	1.1 Improving 505.4 km of rural roads – \$39.38 million	\$49.47 million(545.3km)
1.2	MRD prepares tender documents and selects contractors: by January 2012	August 2011	1.2 Consulting services for design and construction supervision – \$4.98 million	\$6.71 million
1.3	MRD completes the future project design: by 2012	March 2013	2. Road asset management – \$2.00 million	\$1.85 million
1.4	MRD completes 505.4 km of road rehabilitation: by 2014	June 2015	3. Road safety and safeguards – \$1.20 million	\$1.32 million
2.	Road asset management		4. Climate change adaptation – \$5.40 million	\$4.70 million
2.1	MRD completes training programs for MRD on technical and budget management: by 2013	Dec 2013	5. Project management – \$2.01 million	\$0.86 million
2.2	MRD completes training programs on technical, and project management for PDRDs: by 2013	Dec 2013	6. Contingencies – \$11.07 million	
2.3	MRD implements the overloading control program: by 2013	Oct 2013	7. Financial charges during implementation – \$0.96 million	\$0.67 million
2.4	MRD completes the contracting industry support program: by 2014	Dec 2014		
3.	Road safety and safeguards		ADB: \$35.0 million	\$33.55 million
3.1	MRD establishes a new social and environment office: by 2012	April 2012	Government: \$7.25 million	\$6.75 million
3.2	MRD implements the road safety program: by 2014	Dec 2015	Cofinancing: – KEXIM: \$19.35 million – NDF: \$5.40 million	\$21.0 million \$4.29 million
3.3	MRD implements the HIV/AIDS awareness and human trafficking prevention program: by 2014	June 2015	Beneficiaries: 560,000 persons	
3.4	MRD completes the baseline socioeconomic survey with sex-disaggregated data: by 2012	Aug 2011		
4.	Climate change adaptation			
4.1	MRD completes the detailed vulnerability map for climate change for project provinces: by 2014.	Aug 2014		
4.2	MRD completes the ecosystem-based climate change adaptation strategies: by 2014	Dec 2014		
4.3	MRD completes a pilot climate monitoring system-based road maintenance and management program: by 2014	Dec 2014		
4.4	MRD establishes a pilot emergency management system for one project province, and operates it: by 2014	Dec 2016		
4.5	MRD installs the pilot early warning system for one project province (of 4.4): by 2014	Oct 2017		
4.6	Completion of the plan for water capture and storage systems for the project provinces: by 2014	Aug 2016		

Activities with Milestones	Date Achieved	Inputs	Actual Costs
5. MRD manages the project and implements and monitors the labor and gender action plan: by 2014	Jun 2016		

ADB = Asian Development Bank, DBST = double bituminous surface treatment; HHTPP = HIV/AIDS and human trafficking awareness and prevention program; JICA = Japan International Cooperation Agency, KEXIM = Export-Import Bank of Korea, km = kilometer; km/h = kilometer per hour; MRD = Ministry of Rural Development, NDF = Nordic Development Fund, PDRD = provincial department of rural development, PMU = project management unit. SEO = social and environment office.

Source: Asian Development Bank.

## PROJECT COST AT APPRAISAL AND ACTUAL

(\$'000)

Item	Appraisal Estimate			Actual		
	Foreign Exchange	Local Currency	Total Cost	Foreign Exchange	Local Currency	Total Cost
<b>A Investment Costs</b>						
1 Civil Works (CW)				-	-	-
CW-A	7,949	8,511	16,460	9,150	11,739	20,889
CW-B	5,340	5,250	10,590	5,470	5,387	10,857
CW-C	6,140	6,120	12,260	6,770	6,726	13,496
CW-D	-	-	-	750	723	1,473
CW-E	-	-	-	470	462	932
CW-F	-	-	-	700	698	1,398
CW-G	-	-	-	220	197	417
2 Consulting Services for Design and Supervision	-	-	-	-	-	-
DDIS ADB financing	2,183	1,667	3,850	2,772	1,753	4,525
DDIS KEXIM Financing	900	510	1,410	1,617	572	2,189
3 Road Asset Management	1,040	960	2,000	957	894	1,851
4 Road Safety and Safeguards	-	-	-	-	-	-
Road Safety Program	424	276	700	429	476	905
HIV and Human Trafficking Awareness and Prevention	84	166	250	121	298	419
5 Climate Change Adaptation Program	3,460	1,940	5,400	3,014	1,694	4,708
6 Contingency Physical (ADB)	1,600	2,050	3,650	-	-	-
Contingency Physical (KEXIM)	800	1,030	1,830	-	-	-
Contingency Price (ADB)	270	3,670	3,940	-	-	-
Contingency Price (KEXIM)	110	1,540	1,650	-	-	-
<b>Subtotal (A)</b>	<b>30,300</b>	<b>33,710</b>	<b>64,010</b>	<b>32,440</b>	<b>31,619</b>	<b>64,059</b>
<b>B. Incremental Administration Cost</b>	-	-	-	-	-	-
1 Project Management Cost (ADB)	90	650	740	20	270	290
Project Management Equipment–EQ2 (ADB)	10	100	110	11	66	77
Project Management (KEXIM)	70	510	580	-	-	-
2 Priority Operation Cost	-	600	600	-	490	490
<b>Subtotal (B)</b>	<b>170</b>	<b>1,860</b>	<b>2,030</b>	<b>31</b>	<b>826</b>	<b>857</b>
<b>C Financial Charges During Implementation</b>	-	-	-	-	-	-
1 Interest during construction (ADB)	920	-	920	650	-	650
Service Charge (KEXIM)	40	-	40	20	-	20
<b>Subtotal (C)</b>	<b>960</b>	<b>-</b>	<b>960</b>	<b>670</b>	<b>-</b>	<b>670</b>
<b>Total (A+B+C)</b>	<b>31,430</b>	<b>35,570</b>	<b>67,000</b>	<b>33,141</b>	<b>32,445</b>	<b>65,586</b>

ADB = Asian Development Bank, DDIS = detailed design and implementation supervision; EQ = equipment; KEXIM = Export-Import Bank of Korea.

Source: Asian Development Bank.

## PROJECT COST BY FINANCIER

**Table 3-1: Project Cost at Appraisal by Financiers**  
(\$ million)

	ADB		KEXIM		NDF		Government		Total Cost		
	Amount	%	Amount	%	Amount	%	Amount	%	Net	Tax	Total
<b>A. Investment Costs</b>											
1 Improvement of 19 Roads											
CW Package A: Improve 6roads, 211 km			14.30	86.40			2.16	13.60	14.30	2.16	16.46
CW Package B: Improve 5 roads, 142 km	9.31	87.90					1.28	12.10	9.31	1.27	10.59
CW Package C: Improve 8 roads, 153 km	10.79	88.00					1.47	12.00	10.79	1.46	12.26
2 Consulting Services for Design and Supervision											
DDIS ADB Financing	3.20	100.00					0.65	*	3.20	0.65	3.85
DDIS KEXIM Financing			1.07	100.00			0.34	*	1.07	0.34	1.41
3 Road Asset Management (Consulting)	1.73	100.00					0.27	*	1.73	0.27	2.00
4 Road Safety and Safeguards											
Road Safety	0.63	100.00					0.07	*	0.63	0.07	0.70
HIV/AIDS and Human Trafficking Awareness and Prevention Program	0.21	100.00					0.04	*	0.21	0.04	0.25
5 Climate Change Adaptation					5.40	100.00		*	5.40		5.40
6 Contingencies Physical (ADB)	3.65	100.00							3.65		3.65
Contingencies Physical (KEXIM)			1.83	100.00					1.83		1.83
7 Contingencies Price (ADB)	3.94	100.00							3.94		3.94
Contingencies Price (KEXIM)			1.65	100.00					1.65		1.65
<b>Subtotal (A)</b>	<b>33.46</b>		<b>18.89</b>		<b>5.40</b>		<b>6.28</b>		<b>57.75</b>	<b>6.28</b>	<b>64.01</b>
<b>B. Incremental Administration Cost</b>											
1 Project Management (ADB)	0.56	75.70					0.18	24.30	0.56	0.18	0.74
Project Management Equipment–EQ2 (ADB)	0.06	100.00					0.05	*	0.06	0.05	0.11
Project Management (KEXIM)			0.42	75.00			0.14	25.00	0.44	0.14	0.58
2 Priority Operating Cost							0.60	100.00	0.60		0.60
<b>Subtotal (B)</b>	<b>0.62</b>		<b>0.42</b>				<b>0.97</b>		<b>1.70</b>	<b>0.37</b>	<b>2.03</b>
<b>C. Interest During Construction</b>											
1 Interest during construction (ADB)	0.92	100.00							0.92		0.92
Interest (KEXIM)			0.04	100.00					0.04		0.04
<b>Subtotal (C)</b>	<b>0.92</b>		<b>0.04</b>						<b>0.96</b>		<b>0.96</b>
<b>Total Project Cost (A+B+C)</b>	<b>35.00</b>	<b>52.20</b>	<b>19.35</b>	<b>28.90</b>	<b>5.40</b>	<b>8.10</b>	<b>7.25</b>	<b>10.80</b>			<b>67.00</b>

ADB = Asian Development Bank; CW = civil works; DDIS = detailed design and implementation supervision; EQ = equipment; KEXIM = Export-Import Bank of Korea; km = kilometer; NDF = Nordic Development Fund. \* The government finances all local taxes and duties imposed within the territory while ADB/KEXIM/NDF finance 100% of expenditures excluding the taxes and duties.

**Table 3-2: Project Cost at Completion by Financiers**  
(‘000)

Item	ADB		KEXIM		NDF		Government		Total Cost	
	% of Cost		% of Cost		% of Cost		% of Cost		Taxes and	
	Amount	Category	Amount	Category	Amount	Category	Amount	Category	Amount	Duties
	A	A/E	B	B/E	C	C/E	D	D/E	E	F
<b>A Investment Costs</b>										
1 Civil Works (CW)										
CW-A	-		18,990	90.91	-		1,899	9.09	20,889	1,899
CW-B	9,554	88.00	-		-		1,303	12.00	10,857	1,303
CW-C	11,876	88.00	-		-		1,620	12.00	13,496	1,620
CW-D	1,296	88.00	-		-		177	12.00	1,473	177
CW-E	820	88.00	-		-		112	12.00	932	112
CW-F	1,230	88.00	-		-		168	12.00	1,398	168
CW-G	367	88.00	-		-		50	12.00	417	50
2 Consulting Services for DDIS	-		-		-		-		-	-
DDIS ADB financing	4,114	90.91	-		-		411	9.09	4,525	411
DDIS KEXIM Financing	-		1,990	90.91	-		199	9.09	2,189	199
3 Road Asset Management	1,683	90.91	-		-		168	9.09	1,851	168
4 Road Safety and Safeguards	-		-		-		-		-	-
Road Safety Program	823	90.91	-		-		82	9.09	905	82
HIV/AIDS and Human Trafficking Awareness and Prevention Program	381	90.91	-		-		38	9.09	419	38
5 Climate Change Adaptation	-		-		4,280	90.91	428	9.09	4,708	428
6 Contingency Physical (ADB)	-		-		-		-		-	-
Contingency Physical (KEXIM)	-		-		-		-		-	-
Contingency Price (ADB)	-		-		-		-		-	-
Contingency Price (KEXIM)	-		-		-		-		-	-
<b>Subtotal (A)</b>	<b>32,144</b>	<b>50.18</b>	<b>20,980</b>	<b>32.75</b>	<b>4,280</b>	<b>6.68</b>	<b>6,656</b>	<b>10.39</b>	<b>64,059</b>	<b>6,656</b>
<b>B. Incremental Administration Cost</b>	-		-		-		-		-	-
1 Project Management Cost	200	68.97	-		-		90	31.03	290	90
Project Management Equipment EQ2	70	90.91	-		-		7	9.09	77	7
2 Priority Operation Cost	490	100.00	-		-		-		490	-
<b>Subtotal (B)</b>	<b>760</b>	<b>88.68</b>	<b>-</b>		<b>-</b>		<b>97</b>	<b>11.32</b>	<b>857</b>	<b>97</b>
<b>C Financial Charges During Implementation</b>	-		-		-		-		-	-
1 Interest during construction (ADB)	650	100.00	-		-		-		650	-
Service Charge (KEXIM)	-		20	100.00	-		-		20	-
<b>Subtotal (C)</b>	<b>650</b>	<b>97.01</b>	<b>20</b>	<b>2.99</b>	<b>-</b>		<b>-</b>		<b>670</b>	<b>-</b>
<b>Total (A+B+C)</b>	<b>33,554</b>	<b>51.16</b>	<b>21,000</b>	<b>32.02</b>	<b>4,280</b>	<b>6.53</b>	<b>6,753</b>	<b>10.30</b>	<b>65,586</b>	<b>6,753</b>

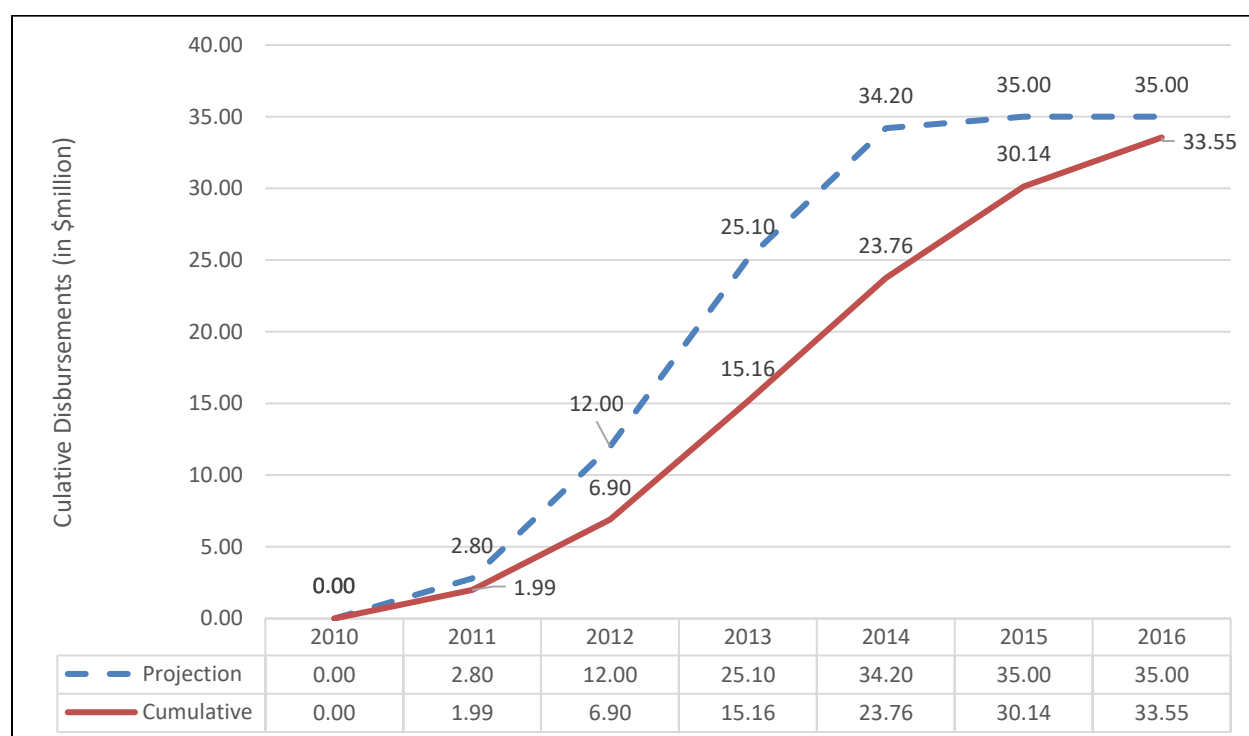
ADB =Asian Development Bank; DDIS = detailed design and implementation supervision; KEXIM = Export-Import Bank of Korea; NDF = Nordic Development Fund.

Source: Asian Development Bank.

## DISBURSEMENT OF ADB LOAN AND GRANT PROCEEDS

**Table 4.1: Annual and Cumulative Disbursement of ADB Loan**

Year	Annual Disbursement		Cumulative Disbursement	
	Amount (\$ million)	% of Total	Amount (\$ million)	% of Total
2011	1.99	5.93	1.99	5.93
2012	4.91	14.63	6.90	20.57
2013	8.26	24.62	15.16	45.19
2014	8.60	25.63	23.76	70.82
2015	6.38	19.02	30.14	89.84
2016	3.41	10.16	33.55	100.00
<b>Total</b>	<b>33.55</b>	<b>100.00</b>		



**Figure 4.1: Projection and Cumulative Disbursement of ADB Loan Proceeds**  
(\$ million)



## CONTRACT AWARDS OF ADB LOAN AND GRANT PROCEEDS

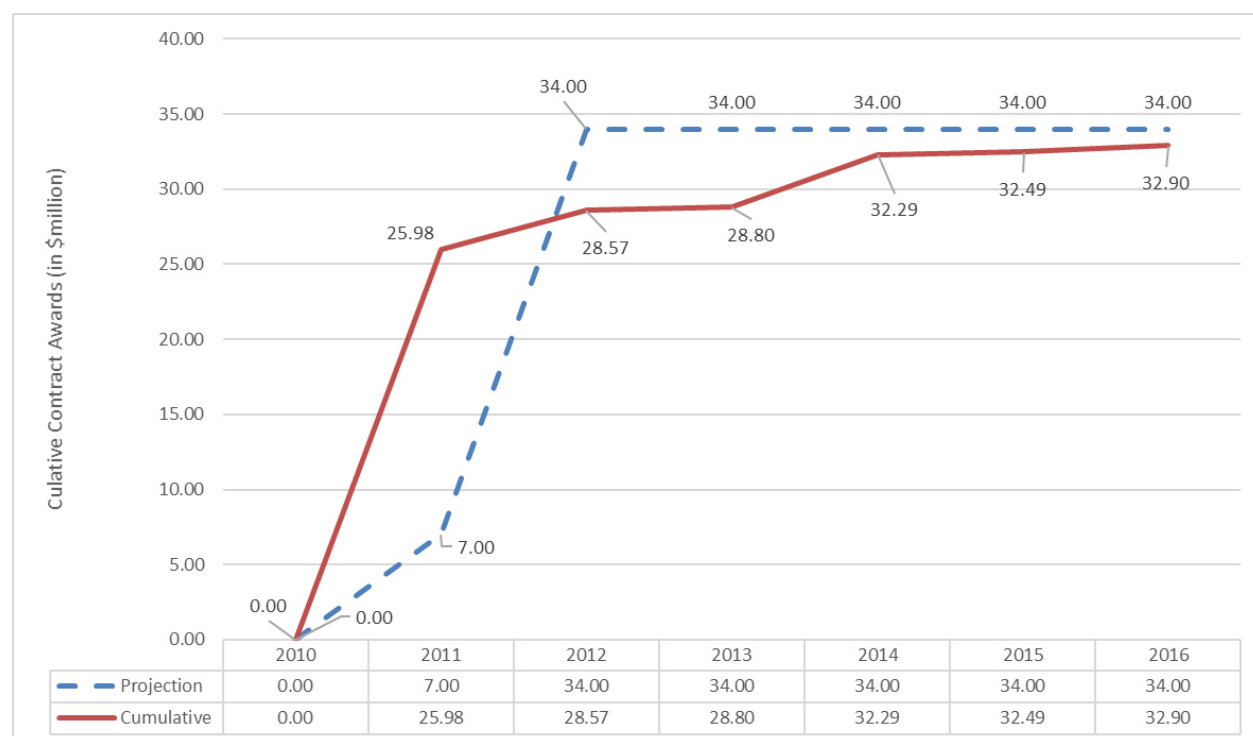
**Table 5.1: Annual and Cumulative Contract Awards of ADB Loan Proceeds**

Year	Annual Contract Awards		Cumulative Contract Awards	
	Amount (\$ million)	% of Total	Amount (\$ million)	% of Total
2011	25.98	79.0	25.98	79.0
2012	2.59	7.9	28.57	86.8
2013	0.23	0.7	28.80	87.5
2014	3.48	10.6	32.29	98.1
2015	0.20	0.6	32.49	98.7
2016	0.41	1.3	32.90	100.0
<b>Total</b>	<b>32.90</b>	<b>100.0</b>		

ADB = Asian Development Bank.

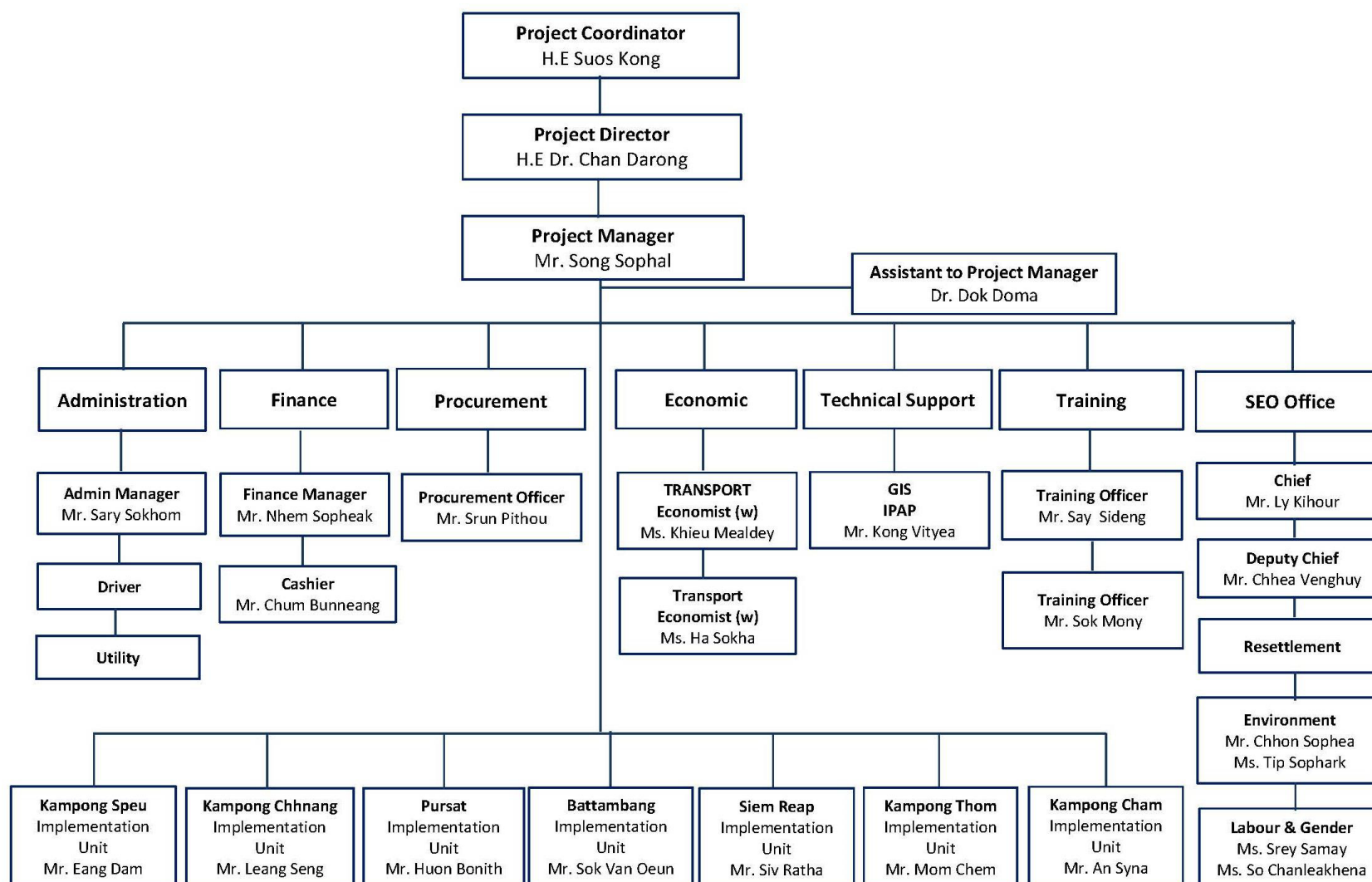
<sup>a</sup> Classified by contract signing dates.

Source: Asian Development Bank.



**Figure 5.1: Projection and Cumulative Contract Awards of ADB Loan Proceeds (\$ million)**

## ORGANIZATIONAL STRUCTURE OF PROJECT MANAGEMENT UNIT



## ENVIRONMENTAL SAFEGUARDS

### A. Environment Categorization and Due Diligence

1. **Initial Environmental Examination.** The Cambodia Rural Road Improvement Project was classified as Environment Category B by the Asian Development Bank (ADB). In line with this classification, an initial environmental examination (IEE) report, including an environmental management plan (EMP), was prepared in September 2010 as part of project preparation, in accordance with the ADB Safeguard Policy Statement (2009). The IEE covered the upgrading of 19 existing rural roads from graveled road to permanently paved roads with double bituminous surface treatment. The total length of the roads is approximately 505.4 kilometers (km) in the provinces of Battambang, Kampong Cham, Kampong Chhnang, Kampong Speu, Kampong Thom, Pursat, and Siem Reap.<sup>1</sup> None of the project roads traverses the buffer and core zones of ecologically protected areas but road improvements in Kampong Thom traverse portions of the buffer and core zones of a culturally significant site, the Prasat Sambour temple, which is proposed for classification as a UNESCO World Heritage site. In Siem Reap, the rural road connects to the paved road network of the Angkor Wat temple complex but does not pass through the complex itself where archaeological structures are found. Certifications of no objection on the project were obtained from the management authorities of Prasat Sambour and Angkor Wat. In addition, an official letter was issued on 30 April 2010 by the Ministry of Environment supporting the project and indicating that the project roads from Prasat Sambo Prey Kuk to Sandan District in Kampong Thom, and another from Kiri Raksmei Commune to Dokpo Commune, Phnom Sruoch District in Kampong Speu are outside protected areas of Prey Boueng Per and Preak Soramrith-Kosamak National Park “Kirirum”.

2. In June 2013, an updated IEE with EMP was submitted to ADB by the Ministry of Rural Development (MRD) to include three roads in Kampong Cham province with a combined length of 42 km.<sup>2</sup> The project will only upgrade the roads within existing widths that comprise of (i) 15-km section of road Pong Teuk to Wat Chhuk; (ii) 10-km section of road Hanchey to Steung Trang; and (iii) 17-km section of road Phsar Pa-Av to Trab.

3. The IEEs identified environmental impacts related to pollution (air, water, and noise), archaeological sites, and workers and community health and safety. Overall, the environmental impacts of the project were localized and temporary. The environmental impacts were manageable during project implementation.

4. **Environmental Management Plan.** The bidding documents for civil works included the IEE and EMP and the contractors were required to submit the contractors’ environmental management plan (CEMP) prior to commencement of civil works. Since details of the location of contractors’ camps, borrow areas, rock sources, crushing plants were not yet known at the bidding stage, the contractors presented these in the CEMP. Contractual obligations of the contractor required them to: (i) engage qualified local unexploded ordnance (UXO) clearance firms and to commence works after appropriate certificate by the UXO clearance company; (ii) prepare the CEMP that addresses the conditions of the construction EMP that has been attached to the bid and contract documents; (iii) orientation of contractor by the project management unit (PMU), social and environment office (SEO), and detailed design and implementation supervision (DDIS);

<sup>1</sup> In 2014, Kampong Cham province was divided into Kampong Cham and Tboung Khmum.

<sup>2</sup> The three additional roads in Kampong Cham province were financed from loan savings of about \$3.7 million. ADB approved these changes through a minor change in project scope on 30 April 2013. ADB approved the three new contracts on 16 January 2014.

(iv) establishment of grievance redress mechanism; (iv) establishment of construction camp provided with proper sanitation and waste management facilities; (v) management of construction materials, spoils, and fuel at construction sites and at quarry and borrow sites; (vi) control of dust and noise; (vii) protection of worker health and safety; (viii) management of traffic and access obstruction; and (ix) avoiding damage to community facilities. The DDIS consultant and ADB found all the CEMPs to be satisfactory.

5. **Compliance with National Environmental Laws.** An environmental assessment is not required for rural roads, provided that these are not located in protected areas. Since the existing roads traverse culturally significant sites such as the Angkor Protected Landscape, the Prasat Sambour Preikuk Temple Ruins, and the transition zone of the Tonle Sap Biosphere Reserve, the MRD coordinated with the relevant management agencies such as the Authority for Protection and Management of Angkor and the Region of Siem Reap and the Ministry of Culture and Fine Arts. Both agencies issued official letters indicating support to the proposed project.

6. Copies of environmental permits of all the commercial quarries and/or crushing plants that were being utilized for the project were secured and submitted to ADB by the PMU as part of the semi-annual monitoring report prepared in 2013.

7. **Public Consultation and Disclosure.** Public disclosure of the project through individual interviews and focus group discussions were conducted in villages along the project roads from July to October 2009 and in March 2013, in compliance with the ADB information disclosure and consultation requirements. In general, the participants welcomed the project because the paved roads will eliminate dust from laterite roads and improve transport connectivity. Major issues that were raised by the participants include: (i) safety hazards because of fast moving traffic; (ii) increased noise levels; (iii) increase in HIV/AIDS because of presence of migrant workers and road connectivity to urban center; and (iii) damage to physical structures if trucks will take a short cut along 266D through Bayon Gate, and the archaeological monument in Prasat Sambour in Road 2620 in Kampong Thom. Mitigation measures were outlined in the IEE to address these issues raised by the villagers.

8. The IEE, updated IEE, and semi-annual environmental monitoring reports were submitted to ADB and disclosed on ADB's website.

## **B. Institutional Setup and Capacity Development**

9. **Component III.** Increase of road safety and safeguards awareness includes the establishment of a new SEO in MRD. The MRD organized the SEO composed of the chief, deputy chief, and five staff. Two of the staff have technical background on environmental sciences. The SEO is under the Department of Rural Roads, General Directorate for Technical Affairs which consists of three units: (i) resettlement, (ii) environment, and (iii) labor and gender.

10. The SEO was supported by the DDIS which included an international environment specialist and a national environment specialist, each with four person-months inputs.<sup>3</sup> During the October 2012 mission, ADB requested the PMU to increase the person-month inputs of the national environmental specialist from 4 months to 10 months to sufficiently cover the monitoring every quarter of all the project roads in addition to the mobilization schedule of the international

<sup>3</sup> Source: Project Administration Manual for Loan 2670. Kingdom of Cambodia: Rural Roads Improvement Project. September 2010.

environment specialist every six months.

11. The DDIS consultant was tasked to provide on-the-job training to the field personnel of MRD to build their capacity on environmental management and monitoring. These environment safeguards trainings were provided by the DDIS for the PMU and SEO during site visits conducted by the international environment specialist. During the ADB missions from 2012 to 2014, ADB noted the absence of environment specialists from the DDIS who could take note of findings on non-compliance with environment and safety measures. In the November 2014 MOU, ADB encouraged SEO and DDIS consultants' environment experts to be more interactive and participatory during loan review missions.

12. During the later phase of the project, the SEO provided satisfactory performance with improved participation. The SEO conducted site inspections, validated the checklists and reports submitted by the contractors and became active participants during ADB review missions.

### **C. Environment Safeguard Measures and Environmental Monitoring and Reporting**

13. **Construction Phase.** The initial civil works contracts were awarded in November 2011 while works started in January 2012 after seeking the UXO clearance. Following the mobilization of the DDIS environment specialists (international and national) in January 2013, the first semi-annual environmental monitoring report (SEMR) covering the period January to June 2012 was submitted to ADB on August 28, 2012. Thereafter, SEMRs were submitted to ADB on a semi-annual basis. The MRD submitted a total of eight SEMRs which were disclosed on the ADB website.

14. In the early stage of project implementation, ADB noted that many of the environmental issues were not captured in the SEMRs, such as lack of personal protective equipment (PPE), warning signs, fire extinguishers, haphazard dumping of stockpiles (including near an irrigation canal), inadequate dust control measures, improper waste management, and failure to rehabilitate open areas. During project implementation, improvements in environmental management were noted, although issues on failure to use PPE and road safety during construction works were still noted in some instances. More frequent water spraying was undertaken in villages and locations with sensitive receptors where dust was a concern.

15. **Project Completion.** The ADB missions observed that completed roads resulted to generally smooth travel. There were no obstructions observed on bridges and culverts; road traffic signs were mostly adequate; and vegetation was growing well on the road embankments. Clean-up and rehabilitation of disturbed areas were implemented satisfactorily by the contractors including the sites used as materials, equipment and fuel storage areas during construction. In general, the local residents are happy with the improved roads.

16. There were still some issues raised such as noise and vibration generated by vehicles passing over the rumble strips which are designed as added road safety features in the school zone. Some borrow pits that were used during construction are now being utilized by villagers as water reservoirs. To ensure safety of the community, these pits need warning signs to indicate water depth, barriers, and flotation devices. With the improved roads, safety could be a concern and the PMU, the Provincial Department of Rural Development (PDRD), and ADB agreed to strengthen the information, education, and communication efforts on road and traffic safety.

17. **Reporting.** The environmental monitoring reports were not submitted immediately to ADB, hence, ADB recommended during the mission in December 2014 to submit the SEMR within a month after the period covered by the report.

18. **Monitoring.** The DDIS consultants conducted environmental monitoring through visual inspection and observations of the construction sites and using the checklist that was prepared from the project's CEMP. Although the IEE specified the conduct of ambient measurements of dust, noise, and surface water quality by the DDIS, there were no baseline measurements of dust, noise, water quality, and vibration. The EMP in the IEE specified field sampling in response to complaints only or to validate pollution events. There were specific requirements for ambient surface water quality sampling for fecal coliform, dissolved oxygen, acidity, oil and grease, and biological oxygen demand on a quarterly basis at the upstream, midstream, and downstream of rivers and streams close to the construction camps but no ambient water quality sampling was conducted nor reported.

19. The national environment specialist of the DDIS was mobilized to conduct site inspection every quarter. The CEMP checklists were compiled every month for all the contract packages by the PMU and then reviewed by the international environment specialist to check whether there are identified environmental issues and complaints from villagers that require remedial action. In addition, actual site surveys and review of the EMP implementation were also undertaken by the international environment specialist, together with the national environment specialist, staff from MRD SEO and accompanied by staff of PDRD every 6 months to check environmental issues at all contract packages. Key findings, observations and recommendations were discussed with the contractors.

#### **D. Conclusion and Recommendations**

20. At the initial stage of project implementation, there were several environmental issues that needed remedial actions by the contractors. Outstanding issues were followed up by the DDIS and PMU/SEO which resulted to the overall satisfactory implementation of environmental mitigation measures. The project carried out several public consultations including coordination with locals. In general, the local people disclosed that completed roads reduced dust pollution in the vicinity. However, the rumble strips which were provided in many school zones to regulate traffic speed were not seen as effective by the villagers because of the noise generated when vehicles pass through the rumble strips. The people also reported that accidents occurred because motorbikes avoid the rumble strips and use the road shoulder instead. The project designs need to consider the effects of the rumble strips on sensitive receptors that could require modifications and adoption of other methods to regulate traffic speed in these zones such as warning signs, traffic light, and zebra lanes for pedestrians.

21. There were some borrow pits used during construction that were converted as water reservoirs by villagers. Barriers, flotation devices, and warning signs should be installed around these pits to ensure safety of the community.

22. There is a need to strengthen the information, education, and communication efforts on road and traffic safety because there are more and faster vehicles using the roads.

## SOCIAL SAFEGUARDS

1. The project was designed to avoid any form of resettlement impacts as the improvement has been limited to pave existing roads within available width. On 5 March 2010, a resettlement framework for the project was prepared by the Ministry of Rural Development (MRD) and agreed by the Asian Development Bank (ADB) and the Ministry of Economy and Finance for the temporary impacts during construction. The project roads have been paved within existing available width. Therefore, it was not necessary to acquire additional lands. The resettlement framework was strictly applied and none of the project roads had required widening.

2. It is noted that, during the implementation of civil works, MRD conducted due diligence surveys for verification of voluntary donation for the land as indicated in the following two special cases.

3. **Case 1: Protecting a section of the project road from gradual river erosion in Battambang Province.** During implementation of civil works, a road section of about 200 meter (m) on the project road 1BB2 in Battambang Province was in a dangerous situation as one side of project road slope had been eroded by the river for a long period of time and the project road and nearby lands were gradually encroached by eroding action. This section needed to be shifted approximately 5 m toward the land side to avoid future erosion.

4. This issue was reported to ADB and the due diligence had been conducted for the voluntary donation through negotiated settlement. The due diligence covered the site investigation, interviews with owners of affected land and prepared support documents on donation of required land by the owners of affected land (3 households).<sup>1</sup> The landowners were aware of the danger of road erosion. They understood that the road and their lands would be washed away in the future if there is no intervention to this erosion. Thus, all the landowners agreed to donate land for shifting the road toward land side. Consultations have been done with participation of land owners and families together with local commune chiefs and village chiefs. The donated land was empty lands between the road and houses. No crops or trees were existed. The due diligence survey under supervision of ADB was done through consultations with land owners, and it was confirmed that voluntary donation procedures were followed with the arrangement by the local government. The due diligence report was submitted to ADB and approved.

5. **Case 2: Constructing ponds in Kampong Thom Province.** Regarding the output 4 (climate change adaptation), the project constructed an emergency operation center, three shelters and four ponds in Kampong Thom Province to reduce climate resilience threat of flooding and drought. Some of lands required for one of the ponds have been donated voluntarily by local land owners: While three ponds in Chhouk Commune, Tropeang Sala Village, were located in the commune land with no resettlement impacts, one pond with the size of about 200 m x 60 m in Kol Commune, Tuol Thnong Village, was constructed with the donation from four households.<sup>2</sup>

6. Before construction, meetings were held in January 2017 to discuss voluntary land donation for pond construction participated by MRD. People indicated their wish to have pond

<sup>1</sup> The affected land was 415 m<sup>2</sup> or 6.85% out of owned land of 6,059 m<sup>2</sup>. 12 persons were affected for the 3 households.

<sup>2</sup> For the 2 households, the affected land was 560 m<sup>2</sup> or 1.19% out of owned land of 4.67 ha. 11 persons were affected for the 2 households. Although the due diligence mission in December 2017 was unable to meet the other two households as they were busy in harvesting rice, the discussion with commune chief proved that they were consulted prior to construction and experienced minor impact.

for both household use and farming. The use for the land was rice cultivation during dry season only. People agreed to thumb print for donating a part of their land to the project. Upon completion of the construction (December 2017), the MRD conducted a due diligence survey for verification of voluntary donation by employing resettlement consultant. Through discussion and consultation with community people and affected households, it was concluded that no concern of resettlement or land acquisition issue involved with the construction of ponds, shelters and the emergency operation center.

7. During the consultation of the pond in Kol Commune, there was one complaint about the damage in the embankment of newly constructed pond which occurred during heavy flooding. The owner wanted the embankment damage to be repaired so as not to drain flood water to his farmland. The due diligence report for Voluntary Donation Verification was submitted to ADB and MRD in December 2017, recommending repairing the damage of the embankment. MRD confirmed that the contractor repaired the damage of embankment to be satisfied with the land owners. No further complains have been received.

8. **Conclusion.** For the main works on paving roads, the project was designed to avoid any form of resettlement impacts as the project roads have been paved within existing available width. There were two special cases where the lands need to be acquired for: (i) protecting a section of the project road from gradual river erosion, and (ii) constructing ponds for the climate change adaptation output. No resettlement issues were found for those land donations through negotiated settlement.



## **SOCIOECONOMIC IMPACT OF THE PROJECT**

1. The project's goal is to promote economic and social development in the project area by improving accessibility; promoting economic growth; reducing transport costs; and improving road safety. Benefit monitoring and evaluation, using baseline and post-completion social surveys, was undertaken to monitor changes in social conditions. The baseline survey was carried in August 2011, while the post-completion survey was carried in March 2016. By comparing of the results of these surveys, changes in social conditions could be identified.

2. The baseline survey was conducted in August 2013 where a total of 1,015 respondents had participated in the survey. The respondents were randomly selected from the project areas consisting of 183 villages in 58 communes within 20 districts in 7 provinces. The female comprised 59% (602 respondents) and 413 were males or 41% of the total number of respondents. Majority (91.7%) of the respondents are residing in agricultural and/or rural areas, less than 1% coming from coastal communities and 8% are residing in the city and/or town proper. The total number of respondents in Kampong Speu is 135 and 130 in Kampong Chhnang. In both provinces, the female comprised 61% of the total number of respondents. In Kampong Cham, the total number of respondents is 142; Kampong Thom has 79; Siem Reap has 149; both Battambang and Pursat have 203 respondents. In all provinces, the females represent more than half of the total respondents.

3. The completion survey was conducted in early March 2016. The respondents were randomly selected from the project areas consisting of 56 villages in 13 communes within 5 districts in 3 provinces. 400 respondents from these provinces were selected and interviewed, focusing on the impacts of roads on the living of peoples. Some 129 respondents from 14 villages in 4 communes in Battambang along rural road 1BB4 were interviewed. In Kampong Chhnang Province, about 130 respondents living in 12 villages along rural road 1KCH2 from two districts were interviewed. In Tboung Khmum, 141 respondents living in 29 villages along rural road TBK370 in 6 communes were interviewed. The male respondents account for about 45% of the total respondents and women for 55%.

### **A. Housing**

4. The four and half years between the baseline and post-completion surveys was too short for significant changes to have occurred in the size, ownership, and construction materials of houses; and in their access to electricity and piped water. However, some positive changes were noted:

- (i) there were many new houses having built recently after the completion of civil works of contractor;
- (ii) the average house size has been increased;
- (iii) the construction quality of houses along the project roads has been improved – using mostly roof tiles as roofing material, rather than thatch; and wood panel and bricks in place of thatch and bamboo for walls;
- (iv) the percentage of households with electricity increased from 50% to 95%; and
- (v) business building have been newly constructed or improved along town area, especially in market area.

5. The improvement of the roads has stimulated mainly these changes, although some probably have been the result of other factors, such as the growth of the national and local economy.

## **B. Household Income and Assets**

6. In the baseline study, majority (23%) of the female respondents and their household members earn a combined monthly income of \$125 to \$200, although they claimed that if only one member of the family is working, they will have an income of less than \$1.00 per day. The respondents have at least two members of the family earning income. For the male respondents, majority (28%) have a monthly household income of \$125 to \$200 and 22% have a monthly income of \$100 or below. For both sexes, majority (79%) of the households' daily income ranges \$1.50 to \$2.50 per day; and about 18% of the respondents have a daily income of \$1.50 or lower.

7. In the completion survey, there are three main sources of incomes. The main source of income is self-employed farming (73% of the total). It followed secondly by selling goods on the roads (10%), and construction labor forces (5%). Farming is the primary source of incomes for more than 33% of respondents in survey provinces; followed by the business of selling agriculture products and petit trades, accounting for about 12% of respondents; selling labors constituting 8% of respondents and civil servants as government officers, police and teachers, accounting for about 4% and 3% respectively. The mean daily income is about KR22,000–KR27,000 or \$5–\$6 a day. The daily income contributes to monthly income. The monthly income varies from about \$200 to \$400 month. The monthly income of respondents varies between the wet and dry seasons. The mean monthly income of respondents in survey provinces varies from \$485 in the dry season to \$885 in the wet season.

8. About 26% of respondents have expressed the increase in household expenditure and 0.25% of respondents have expressed significant increase since 2011. In addition, about 45% of respondents confirm the same expenditure. However, 0.25% and 6% of respondents express the significant decrease and decrease respectively.

## **C. Changes in the Last Four and Half Years**

9. The majority of respondents to the post-completion surveys thought that village life in general had improved in the previous 4 years and a half. Survey respondents were much happier about the changes in village life in the post-completion period than they were in the baseline period. In the post-completion surveys, the main reasons for positive changes were:

- (i) easier and reliable access to works, schools, markets and other social services;
- (ii) expansion of opportunity in non-agricultural employment;
- (iii) improvements in road access all-year and all-weather; and
- (iv) increased traffic and business activities.

## **D. Changes in Travel**

10. Most forms of rural transports in the three lines of rural roads surveyed have significantly increased traffic volumes since the road rehabilitations. There is universal increase in rural passenger traffic across the sample sites and, with some notable exceptions; freight traffic has generally increased. The improvement of the project roads has almost certainly reduced transport costs, allowing greater supply of transport services at a given price.

## **E. Benefits of Improved Rural Roads**

11. The Rural Roads Improvement Project (RRIP) investments have benefited the poor as well as the non-poor families. Poor people are happy with the reduced transport costs that result from improved roads network. Reduced transport costs mean reduced costs of inputs to both

their farm and nonfarm activities, reduced prices and increased selection of consumer goods, and reduced sensitivity to transport costs and time when marketing their own produce. Poor people near the poverty line in the surveyed areas are mobile and express demand for transport services. They share equally in the qualitative benefits of improved access to health, education, social and community services, increased safety and security, and access to information.

12. Economic activity, in the three provinces where presented by RRIP, has increased as indicated by higher incomes, greater use of modern agricultural technologies, and larger gross daily sales in village shops. Social welfare has been enhanced as indicated by easier access to rural schools and rural health care. These gains cannot be fully attributed to the improvement of rural roads but are merely coincident. Certainly, reduced travel times are a function of the rural roads improvement and it is reasonable to assume that these resulted to economic gains for activities that depend on the rural road being there. Reduced travel costs are implied by reduced travel times and a slight decline in passenger transport prices.

13. An impact often associated with the development of rural roads is increased land prices, resulting in better accessibility between rural and urban areas. Majority of the respondents from Tboung Khmum and Kampong Chhnang Province said that there has been an increase in land price by up to 30% after better road access. However, this increase was in the range of 0%–15% as perceived by the respondents of Battambang Province.

14. With respect to increased access to productive inputs in the three roads' areas, it seems apparent from the increased use of purchased inputs that availability has improved. From the passenger surveys, 70% out of shopkeepers in the passenger sample were carrying goods for resale. Independent of whether or not a passenger was a shopkeeper, another 15% of passengers in the survey were carrying goods for sale. If these ratios are representative of passenger practice more widely, it seems apparent that advantage is being taken of improved transport services for supplying rural markets.

## **F. Conclusions**

15. A comparison of the results of the baseline and post-completion surveys identified changes in travel time and social conditions. Some of these changes were the direct result of the road improvements, while others probably happened for other reasons, but were facilitated by the road improvements. Some changes like traffic crashes due to speeding of vehicles must be considered disbenefits of the road improvements.

16. The main direct benefits of improved rural roads identified by the surveys were:

- (i) easier transport of crops and agricultural inputs;
- (ii) easier for students to reach schools;
- (iii) reduction in the time to reach most health centers;
- (iv) reduction in time to reach certain amenities and business, such as markets, agricultural farms and other agricultural production services; and
- (v) remarkable reductions in average travel times from villages to commune centers, district centers, provincial centers, along rural roads.

17. The improved rural roads could facilitate improvements by enabling villagers to increase their incomes through higher agricultural production and crops sales, and a reduction in transport costs for goods and materials brought into the village. The road improvements are likely to facilitate the following improvements:

- (i) construction of new houses and better housing, e.g., an increase in average house

- size, use of better construction materials, and an increase in the percentage of households with electricity;
  - (ii) an increase in the average net income of rural households, and an increase in the number of families owning household goods, vehicles, and agricultural capital;
  - (iii) an increase in the percentage of children attending lower secondary schools; and
  - (iv) a net increase in the number of using health facilities.
18. The surveys identified the following disbenefits of improved rural roads:
- (i) increased risk of accidents—particularly higher speed of motorcycles and vehicles especially at night time; and
  - (ii) higher land prices.
19. The majority of respondents to the post-completion surveys thought that village life in general had been improved in the previous 4 and a half years. The main reasons were identified as:
- (i) reliable all-weather and all-year access roads;
  - (ii) change in access to school, markets, farms and other social services;
  - (iii) increase construction activities in buildings houses; and
  - (iv) expansion in non-agricultural employment due to saving travel time.
20. The project has provided significant social benefits, resulting from the reduction in travel times and the convenient and reliable road conditions due to the provision of double bituminous surface treatment roads. The most appreciated advantage of the project is the availability of transport means during all year round and reliable access to villages at any time of the year. The surveys suggested that life in the rural villages has tremendously improved due to dust-free paved roads, and the road improvements have facilitated many of the positive changes in utilizing their time for developing business and social activities.

### STATUS OF COMPLIANCE WITH THE LOAN COVENANTS

Covenant	Reference in Loan Agreement	Status of Compliance
<p>The Borrower shall (i) maintain, or cause to be maintained, separate accounts for the project; (ii) have such accounts and related financial statements audited annually, in accordance with appropriate auditing standards consistently applied, by independent auditors whose qualifications, experience and terms of reference are acceptable to ADB; (iii) furnish to ADB, as soon as available but in any event not later than 6 months after the end of each related fiscal year, certified copies of such audited accounts and financial statements and the report of the auditors relating thereto (Including the auditor's opinion on the use of the Loan proceeds and compliance with the financial covenants of the Loan Agreement as well as on the use of the procedures for imprest account and statement of expenditures), all in the English language; and (iv) furnish to ADB such other information concerning such accounts and financial statements and the audit thereof as ADB shall from time to time reasonably request.</p>	Sect. 4.02 (a)	<p>Partially Complied</p> <p>The audited project financial statements submitted for the project did not include the additional auditor's opinion indicating the use of loan proceeds, compliance with financial covenants of the Loan Agreement as well as on the use of the procedures for imprest account and statement of expenditures.</p>
<p>The Borrower shall enable ADB, upon ADB's request, to discuss the Borrower's financial statements for the project and its financial affairs related to the project from time to time with the auditors appointed by the Borrower pursuant to Section 4.02(a) hereabove, and shall authorize any representative of such auditors to participate in any such discussions requested by ADB, provided that any such discussion shall be conducted only in the presence of an authorized officer of the Borrower unless the Borrower shall otherwise agree.</p>	Section 4.02 (b)	Complied
<p>The Borrower shall enable ADB's representatives to inspect the project, the Goods and Works, and any relevant records and documents.</p>	Section 4.03	Complied
<p>The Borrower and MRD shall ensure that the project is implemented in accordance with the detailed arrangements set forth in the PAM. Any subsequent change to the PAM shall become effective only after approval of such change by the Borrower and ADB. In the event of any discrepancy between the PAM and the Loan Agreement, the provisions of the Loan Agreement shall prevail.</p>	Schedule 5, para. 1	Complied
<p>The Borrower shall set up an interministerial committee as the project steering committee, responsible for provision of guidance and overall coordination on all matters pertaining to maintenance, planning, implementation and disbursement for the national roads project Implementation.</p>	Schedule 5, para. 2	Complied

<b>Covenant</b>	<b>Reference in Loan Agreement</b>	<b>Status of Compliance</b>
MRD shall be the project executing agency and shall be responsible for the overall technical supervision and execution of the project.	Schedule 5, para. 3	Complied
A PMU shall be established in MRD for project implementation, management, and coordination. The PMU shall initiate and coordinate effective communication between all stakeholders of the project, including the executing agency, MEF, and other agencies of the Borrower, beneficiary stakeholders and donor agencies. The PMU shall be headed by a project coordinator, and technically headed by a project director and a project manager who are technically well qualified with long experience in managing ADB-assisted projects. The project coordinator, at Secretary of State level, shall coordinate all project activities within and outside MRD. The project director, at Director General level, shall manage detailed project activities and report to the project coordinator. The project manager, at deputy Director General level of MRD, shall assist the project director in managing daily activities. MRD shall ensure that all the personnel identified for PMU take the positions prior to commencement of project implementation.	Schedule 5, para. 4	Complied
Each PDRD of the concerned project province shall be the implementing agency in carrying out the detailed project implementation in the project province, including executing civil works.	Schedule 5, para 5	Complied
MRD shall complete the ongoing draft MRD policy for rural roads, as acceptable to ADB, ensure that it be approved by the Minister of MRD within 9 months after loan effectiveness and disclose it in a public address and media, as a draft policy, by the Minister of MRD. MRD shall also ensure that implementation of this policy is supported by an appropriate institutional arrangement as acceptable to ADB.	Schedule 5, para. 6	Delayed, but Complied. The Minister of MRD approved the draft Rural Road policy on 22 Jan 2013.
MRD shall complete the draft sub-decree on road right of way for MRD as acceptable to ADB, and have it approved by the Minister of MRD within 12 months after loan effectiveness and submit it for the approval of the Borrower's Council of Ministers.	Schedule 5, para. 7	Delayed, but Complied. The Minister of MRD approved the draft sub-decree of right-of-way and submitted it for the approval of the Council of Ministers on 29 March 2013.
MRD shall complete the draft sub-decree on axle load control for MRD roads, as acceptable to ADB, and have it approved by the Minister of MRD, submit for approval of the Borrower's Council of Ministers and Prime Minister and implement such axle load control program effectively, within 12 months after loan effectiveness.	Schedule 5, para. 8	Delayed, but Complied. The Minister of MRD approved the draft sub-decree of Axle Load Control and submitted it for the approval of the Council of Ministers on 21 March 2013. The Prakas of Axle Load Control on Rural Roads was approved by the Minister of MRD in July 2013.

<b>Covenant</b>	<b>Reference in Loan Agreement</b>	<b>Status of Compliance</b>
MRD shall implement the RARM and implement such RARM and the Good Governance Framework effectively during the entire project implementation period, as acceptable to ADB.	Schedule 5, para. 9	Complied
Apart for the standard requirements of ADB's public disclosure policy, MRD shall publicly disclose its activities as mentioned in paragraphs 6–9 above, and local procurement activities in MRD's website, in order to increase the public awareness on its good governance practices, stipulated in paragraph 6 above.	Schedule 5, para. 10	Complied Results of bid evaluation and contract award of civil works were disclosed in MRD website: <a href="http://www.mrd.gov.kh/index.php?option=com_content&amp;view=cate gory&amp;id=73%3Arural-roads-improvement-project-rip&amp;Itemid=65&amp;layout=default&amp;lang=en">http://www.mrd.gov.kh/index.php?option=com_content&amp;view=cate gory&amp;id=73%3Arural-roads-improvement-project-rip&amp;Itemid=65&amp;layout=default&amp;lang=en</a>
MRD shall be responsible for the operation and maintenance of the project facilities through proper technical supervision and adequate fund allocation. The Borrower will ensure that annually adequate budget is made available for the operation and maintenance of project facilities during and after the project.	Schedule 5, para. 11	Complied
The Borrower and MRD shall ensure that all the project facilities shall be constructed, operated, maintained, and monitored in strict conformity with: (a) all applicable environmental laws and regulations, policies, procedures and guidelines of the Borrower, (b) ADB's Safeguard Policy Statement (2009); and (c) the environmental mitigation and monitoring measures detailed in the EMP.	Schedule 5, para. 12	Complied
In case of any discrepancy between the Borrower's laws and regulations and ADB's policy regarding environmental protection, ADB's policy shall prevail.	Schedule 5, para. 13	Complied
To minimize any adverse environmental impacts arising from the construction and operation of the project, MRD shall ensure implementation of all environmental mitigation and monitoring measures set forth in the EMP.	Schedule 5, para. 14	Complied
MRD shall ensure that all bidding documents and civil works contracts contain provisions that require contractors to comply with the mitigation measures set forth in the EMP, and allocate a budget for all such environmental mitigation measures	Schedule 5, para. 15	Complied
MRD shall adequately supervise and monitor the construction works carried out by contractors to ensure compliance with the mitigation measures set forth in the EMP.	Schedule 5, para. 16	Complied
MRD shall award civil works contracts upon confirmation that necessary environmental approval for the project has been obtained from the Ministry of Environment of the Borrower. A copy of such approval, if required, shall be submitted to ADB upon issuance.	Schedule 5, para. 17	Complied

<b>Covenant</b>	<b>Reference in Loan Agreement</b>	<b>Status of Compliance</b>
MRD shall update the EMP in a form and manner satisfactory to ADB, if any unanticipated environmental risks and impacts arise.	Schedule 5, para. 18	Complied
MRD shall update the IEE in a form and manner satisfactory to ADB, if there are any changes to project design that would cause significant environmental risks or impacts not with the scope of the IEE and submit such updated IEE to ADB for clearance.	Schedule 5, para. 19	Complied
Prior to commencement of site works, MRD shall establish an environmental GRM, acceptable to ADB, to receive and facilitate resolution of affected peoples' concerns, complaints, and grievances about the project's environmental performance. MRD shall make public the existence of this GRM through public awareness campaigns; review and address environmental grievances of stakeholders in relation to the project, any of the service providers, or any person responsible for carrying out any aspect of the project; and proactively and constructively respond to such grievances.	Schedule 5, para. 20	Complied Project complaint mechanism was posted in the MRD website: <a href="http://www.mrd.gov.kh/index.php?option=com_content&amp;view=article&amp;id=807%3Arrip-complaint-handling-mechanism&amp;catid=73%3Arural-roads-improvement-project-rrip&amp;Itemid=65&amp;lang=en">http://www.mrd.gov.kh/index.php?option=com_content&amp;view=article&amp;id=807%3Arrip-complaint-handling-mechanism&amp;catid=73%3Arural-roads-improvement-project-rrip&amp;Itemid=65&amp;lang=en</a>
MRD shall submit semi-annual environmental monitoring reports to ADB.	Schedule 5, para. 21	Complied; 8th (final) semi-annual report (Jan–Jun 2016) was submitted on 24 Oct 2016
MRD shall ensure that any involuntary resettlement be carried out in accordance with the agreed resettlement framework, ADB's Safeguards Policy Statement, and relevant laws of the country. In case of differences between Borrower's laws and regulations and ADB's policy in this regard, ADB's policy shall prevail.	Schedule 5, para. 22	Complied
In case of such involuntary resettlement, MRD, in close collaboration with the Resettlement Department of MEF as the secretariat of the Interministerial Resettlement Committee of the Borrower, shall be responsible for internal monitoring of resettlement activities, including engagement of an external monitoring agency 1 month before commencement of detailed design. The internal and external monitoring reports shall be submitted to ADB every quarter and uploaded on MRD's website within 2 weeks of their submission; and such monitoring and reporting activities shall be carried out until resettlement has been completed.	Schedule 5, para. 23	Complied
In case of such involuntary resettlement, the Borrower shall ensure the timely provision of counterpart funds for resettlement to satisfy the requirements and objectives of resettlement.	Schedule 5, para. 24	Complied
The Borrower shall ensure the effective implementation of the Labor and Gender Action Plan. The Borrower shall ensure that all works	Schedule 5, para. 25	Partially complied



Covenant	Reference in Loan Agreement	Status of Compliance
contracts under the project incorporate provisions and budgets to the effect that contractors (a) comply with the Borrower's applicable labor laws and related international treaty obligations and do not employ child labor, (b) provide safe working conditions and separate water and sanitation facilities for male and female workers in the construction camps and in the construction sites, (c) provide equal wages to male and female workers for work of equal value, (d) recruit local labor for construction work (with at least 40% of unskilled laborers to be women) and road maintenance (with at least 50% of them to be women), (e) the contractor maintains the Borrower's Ministry of Health approved first aid kits and facilities on each construction site and maintain a register of all work related accidents, and (f) be responsible for the evacuation of any injured worker to a hospital as a result of any work related crash in case if the contractor's first aid is insufficient.		
The Borrower shall ensure that the project does not affect any ethnic minority peoples. In case any ethnic minority is affected, MRD shall develop an ethnic minority development plan acceptable to ADB in accordance with ADB's Safeguards Policy Statement.	Schedule 5, para. 26	Complied
MRD shall ensure that the agreed HIV/AIDS and Human Trafficking Prevention Program will be implemented and monitored.	Schedule 5, para. 27	Complied
MRD shall ensure that ADB's environmental and social safeguard policies and requirements are applied and implemented for all components regardless of financing source.	Schedule 5, para. 28	Complied
MRD shall ensure that the social and environmental unit in MRD be established before the detailed design and implementation supervision consultants are recruited.	Schedule 5, para. 29	Complied
The Borrower shall ensure that the counterpart financing be made available in a timely manner for the project's smooth implementation	Schedule 5, para. 30	Ongoing
MRD shall ensure that all project roads and related facilities are rehabilitated according to appropriate standards acceptable to ADB.	Schedule 5, para. 31	Complied
MRD shall ensure that all training programs in the road asset management output be implemented to sustain the objectives of such training, within MRD and within the sector, including the construction industry of Cambodia.	Schedule 5, para. 32	Complied
MRD shall (i) ensure that application of a uniform effective financial and accounting system compatible with ADB's Guidelines for Governance and Financial Management be established and maintained that meets internationally recognized	Schedule 5, para. 33	Complied

Covenant	Reference in Loan Agreement	Status of Compliance
standards, and (ii) apply procurement processes on the basis of transparency, simplicity, and client responsiveness.		
The Borrower and MRD shall comply with ADB's Anticorruption Policy (1998, as amended from time to time). The Borrower and MRD agree: (a) that ADB reserves the right to investigate any alleged corrupt, fraudulent, collusive or coercive practices relating to the project; and (b) to cooperate fully with any such investigation and to extend all necessary assistance, including providing access to all relevant books and records, as may be necessary for the satisfactory completion of any such investigation.	Schedule 5, para. 34	Complied
Within 9 months after the effective date, MRD shall create a project website to disclose information about various matters on the project, including procurement. With regards to procurement, the website shall include information on the list of participating bidders, name of the winning bidder, basic details on bidding procedures adopted, amount of contract awarded, and the list of goods/services procured.	Schedule 5, para. 35	Complied
Within 9 months after the effective date, MRD shall prepare a GRM, acceptable to ADB, and establish a task force to receive and resolve complaints/grievances or act upon reports from stakeholders on misuse of funds and other irregularities, including grievances due to resettlement and environmental issues. The task force shall (i) make public the existence of this GRM, through a public awareness campaign; (ii) review and address grievances of stakeholders of the project, in relation to either the project, any of the service providers, or any person responsible for carrying out any aspect of the project; and (iii) proactively and constructively respond to them.	Schedule 5, para. 36	Complied
The Borrower and MRD shall sign and implement the Good Governance Framework. With respect to the several requirements under the Good Governance Framework that are similar to the requirements stated in paragraphs 35 and 36 of this Schedule 5 to this Loan Agreement, such as the requirements to establish a project website and GRM, the Borrower and MRD shall only establish one project website and one GRM to meet the conditions under the Good Governance Framework and this Loan Agreement. MRD shall consult with ADB to ensure that the project website and the GRM are acceptable to ADB.	Schedule 5, para. 37	Complied. Updated during August 2016 Final Loan Review Mission.
The Borrower shall ensure that civil works contracts financed by the project have provisions that before commencing their construction works, civil works contractors: (a) shall have cleared all UXOs on the	Schedule 5, para. 38	Complied

<b>Covenant</b>	<b>Reference in Loan Agreement</b>	<b>Status of Compliance</b>
construction sites; and (b) shall provide to MRD the verification that the construction sites have actually been cleared. MRD shall not issue a notice to proceed for any construction works until it obtains such verification from the concerned civil works contractors.		
MRD shall ensure that the baseline socioeconomic survey with sex-disaggregated data is completed within a period of 9 months after the loan effective date.	Schedule 5, para. 39	Complied.

ADB = Asian Development Bank; EMP = environmental management plan; GAP = gender action plan; GRM = grievance redress mechanism; IEE = initial environmental examination; MEF = ministry of Economy and Finance; MRD = Ministry of Rural Development, PAM = project administration manual; PDRD = provincial department of rural development; PMU = project management unit; RARM = risk assessment and risk management plan; UXO = unexploded ordnance.

## **UPDATED ECONOMIC EVALUATION OF THE PROJECT**

### **A. Introduction**

1. The economic internal rate of return (EIRR) for the project is calculated as the difference between the capital and road user costs with and without the project. Calculations have been made for a 25-year period starting 2012. Road improvements were completed in 2015, giving a benefit period of 20 years. No benefits have been included for sections of the roads that are completed before the end of the overall construction period. Similarly, no costs to road users caused by disruptions to traffic during construction have been included.

### **B. Prices**

2. Costs and benefits have been calculated using economic costs based on border prices for traded goods and services and domestic market prices net of taxes and subsidies for non-traded items. The prices are for mid-2014 using the United States dollar as the unit of currency. Fuel prices have been volatile in recent years, reflecting major changes in the price of crude oil, and the current price may not represent an appropriate price to use as the price in real terms over the evaluation period. The future pressure of demand and the limit on supply are expected to increase the oil price above current levels. A long-term average crude oil price of \$100 per barrel in current price terms has been assumed. This is consistent with border prices of about \$0.68 per liter for diesel fuel and \$0.65 per liter for petrol. Although fuel is an important component of vehicle operating costs (VOCs), it does not dominate the total, even with the relatively high fuel prices assumed. Passenger time values are likely to increase in real terms, in step with increasing per capita income, and an allowance has been made to reflect this. On the other hand, there is considerable underemployment in Cambodia among unskilled laborers. This is reflected in adopting a shadow price of 0.75 of the market rate for unskilled labor.

### **C. Traffic Demand Analysis**

3. Traffic estimates were made for each road section evaluated. Base year traffic levels were estimated from 2-day manual classified counts carried out on all roads, with more than one count site used in some cases. These were verified by moving observer counts, which were used to check on changes in traffic flow along the roads, and then adjusted to an annual average daily traffic basis. Traffic growth was forecast by applying elasticities of demand for transport with respect to gross domestic product (GDP) growth, with growth rates forecast for three separate time periods over the evaluation period. The range of growth rates was from 3.6% per year for freight vehicles in the immediate future, to 12% per year for motorcycles in the medium term. In addition to this normal traffic growth, it was assumed that traffic would increase by up to 30% following the sealing of roads, to allow for the impact of road user cost reductions and all-weather accessibility.

### **D. Evaluation Model**

4. The economic analysis of upgrading the roads is based on the Highway Development and Management Tool HDM-4. The latest version available (version 2.06) has been used in this study. The model simulates the road condition for each road section, year-by-year, considering (i) road deterioration, which is the prediction of pavement deterioration and surface roughness; (ii) works effects, whereby the effects of road works on pavement condition are simulated and the corresponding costs determined; and (iii) road user effects, with the costs of vehicle operation and travel time being determined to estimate the costs and benefits of alternative road improvement and maintenance strategies.

## E. Benefits

5. Three types of benefits are considered: (i) the residual value of the works, (ii) savings in travel time, and (iii) road user savings. The residual value of the project at the end of the evaluation period is estimated at 25% of capital costs, reflecting the fact that much of the cost is in the base course rather than the surfacing, and a significant part of this material could be recovered.

6. Travel time savings are the result of the increase in vehicle speeds on the improved roads. The estimate of such savings is based on GDP per head of the working population, and the International Monetary Fund<sup>1</sup> estimated per capita GDP at current prices to be \$853 in 2009. Assuming that 45% of the population is economically active and on average work 2,000 hours per year, the average hourly income in 2009 becomes \$0.95. This is much higher than typical rural incomes in Cambodia and a value of \$0.5 per hour has therefore been used for the working time of motorcycle users and public transport passengers. For passengers in cars and 4-wheel drive vehicles, which typically are in the highest 20% income group, an average working time income of \$2 per hour has been assumed. Non-work travel time (50% of total travel time for car and 4-wheel drive passengers and 30% for others) is valued at \$0.3 per hour for car and 4-wheel drive passengers and \$0.15 for other passengers. Freight time cost savings have not been considered.

7. VOCs stem primarily from reduced surface roughness and increased travel speed on the improved roads. Using HDM-4, VOC savings are estimated for 14 vehicle types in common use in rural Cambodia, including conventional motorized vehicles, non-motorized vehicles, and unconventional motorized vehicles. Table 1 gives details on the vehicle types and their estimated VOCs for a range of roughness levels.

**Table 1: Vehicle Operating Costs Data**

Vehicle Type	Vehicle Characteristics						VOC (\$/km)		
	ESA	Service Life (years)	Annual Utilization			Economic Price (\$)	IRI (m/km)		
			Hours	Km	No. of Passengers		IRI 3	IRI 6	IRI 12
Bicycle	0.00	10	150	2,500	1.0	40	0.03	0.04	0.05
Animal cart	0.00	6	1,300	4,000		300	0.11	0.13	0.16
Motorcycle	0.00	8	600	8,000	1.2	700	0.03	0.03	0.04
3-wheeler	0.00	8	600	8,000	1.2	850	0.04	0.05	0.05
Car	0.00	12	750	15,000	3.0	22,000	0.22	0.26	0.31
Jeep/4-wheel drive	0.01	10	750	15,000	2.5	66,500	0.32	0.42	0.56
Pick-up	0.05	10	1,250	25,000	1.0	20,000	0.29	0.34	0.47
Minibus	0.04	10	3,800	75,000	9.0	23,500	0.15	0.20	0.32
Bus	0.70	10	1,750	35,000	20.0	57,000	0.32	0.46	0.57
Small koyun <sup>a</sup>	0.05	10	400	6,000		1,500	0.05	0.06	0.08
Large koyun	0.20	10	400	6,000		3,000	0.21	0.36	0.45
Light Truck	0.20	10	1,600	30,000		31,000	0.22	0.29	0.36
Medium Truck	0.80	12	2,000	40,000		42,000	0.29	0.38	0.51
Heavy Truck	3.50	12	2,400	45,000		110,000	1.04	1.32	1.53

ESA = equivalent standard axles, IRI = international roughness index, km = kilometer, m = meter, VOC = vehicle operating cost.

<sup>a</sup> A small koyun is two-wheeled tractor with a single-axle trailer. A large koyun is a locally-made medium-sized 2-axle truck produced from second-hand parts. These vehicles are much slower than conventional vehicles and are normally used for short distance freight and local passenger movements.

Source: Asian Development Bank

<sup>1</sup> International Monetary Fund. 2009. *World Economic Outlook database*. Washington D.C.

## F. Project Costs

8. Specific cost estimates have been produced for each road project based on the actual costs disbursed to the civil works contractors. The cost estimates include the double bituminous surface treatment pavement and the base course, subbase plus the cost of bridges, drainage structures such as pipe culverts and box culverts. Cost of slope protection and road furniture were also included.

9. The current bridges are adequate in most cases, with many newly constructed. Where bridges are inadequate, the cost of replacing them has been included in the project cost. Similarly, flood and riverbank erosion protection works have been included in the costs where considered necessary. These works add significantly to the overall cost per kilometer in some cases. No land acquisition or resettlement costs were occurred.

10. The overall economic costs used for the evaluation range from \$72,000 to \$339,000 per kilometer. The financial and economic costs for each project road are in Table 2.

**Table 2: Road Improvement Costs (\$ per km)**

Road No. and Name		Financial	Economic
370	Tboung Khmum–Ou Reang Ov	85,708	68,566
371	Peus Pir–Kdol Leu (Trea)	85,708	68,566
373C	Memot (NR7)–Kabas	99,993	79,994
2620 and 2KT2	NR62–Prasat Sambour–Sandán	99,993	79,994
1KCH2	Phsar Pong Ror–Ra Krang Skear	72,024	57,629
151C	Phsar Trach–Tbeng Khpos–Wat Prah Theat	72,024	57,629
1KCH3	Spean Pour–Ra Meanor	78,026	62,421
154D	Boeng Khnar–Metoek	72,207	57,765
152E	NR5 (Beung Kantout)–Kampong Po	72,207	57,765
155D	Boeng Khnar–Taluo	91,899	73,519
155C	NR5 (Trpaing Chorong)–Bord Rumdoul (Phtah Rong)	72,207	57,765
1PS2	Talou–Samraong Village	72,207	57,765
1BB1	NR5 (Prey Svay)–Sdok Praveuk	91,899	73,519
1BB2	NR5 (Railway)–Prek Chik–Chong Por	85,335	68,268
1BB3 and 1BB4	NR5 (Chrey)–Talas–Karkos	78,771	63,017
1KS3	Phsar Traepang Kraleung–Phsar Pang Kassey	78,027	62,421
1KS4	Samki Reaksmey–Dak Por	84,028	67,223
266E	Puok–Angkor Chum	79,994	63,995
266D and 2SR2	Leang Dai–Svay Sor	85,708	68,566
KC10 (CW-D)	Pong Teuk–Wat Chhuk	117,896	94,317
KC12-1	Batdei Kraum–Kampong Pruol	338,798	271,038
KC2 (CW-E)	Hanchey–Steung Trang	93,506	74,805
KC11 (CW-F)	Phsar Paav–Trob	83,466	66,773

BB = Battambang; CW = civic works; KC = Kampong Cham; KCH = Kampong Chhnang; km = kilometer; KT = Kratie; NR = national road; PS = Pursat; SR = Svey Rieng.

Source: Asian Development Bank.

11. In estimating road maintenance costs, the actual maintenance regime for the currently unsealed roads has been considered, comprising annual grading and ad hoc repair works plus periodic maintenance involving regravelling every 2–3 years. For the improved roads, it is assumed that routine maintenance is carried out as required according to the predicted surface condition. A double bituminous surface treatment reseal is assumed when 40% of the carriageway

is cracked, or after 8 years irrespective of surface condition. The unit costs for maintenance are in Table 3.

**Table 3: Road Maintenance Cost Rates**

Surface Type	Work Item	Unit	Cost (\$)
Unsealed Road	grading	km	100.0
	regravelling	m <sup>3</sup>	7.0
	crack sealing	m <sup>2</sup>	1.0
Sealed road	patching	m <sup>2</sup>	4.2
	edge repair	m <sup>2</sup>	6.4
	DBST reseal	m <sup>2</sup>	2.5
All surface	annual routine	km	350.0

km = kilometer, m<sup>2</sup> = square meter, m<sup>3</sup> = cubic meter; DBST = double bituminous surface treatment.

Source: Asian Development Bank.

## G. Economic Analysis

12. The results of the economic evaluation for the individual project roads are summarized in Table 4.

**Table 4: Summary of Evaluation Results by Road Section**

Road No.	Name	NPV (\$ million)	EIRR (%)
370	Tboung Khmum–Ou Reang Ov	29.66	59.2
371	Peus Pir–Kdol Leu (Trea)	4.03	30.7
373C	Memot (NR7)–Kabas	2.80	26.9
2620 and 2KT2	NR62–Prasat Sambour–Sandán	17.75	39.8
1KCH2	Phsar Pong Ror–Ra Krang Skear	2.55	25.0
151C	Phsar Trach–Tbeng Khpos–Wat Prah Theat	18.11	58.2
1KCH3	Spean Pour–Ra Meanor	0.79	22.3
154D	Boeng Khnar–Metoeuk	0.24	16.4
152E	NR5 (Beung Kantout)–Kampong Po	0.60	23.2
155D	Boeng Khnar–Taluo	2.69	25.1
155C	NR5 (Trpaing Chorong)–Bord Rumdoul (Phtah ROUNG)	4.09	32.3
1PS2	Talou–Samraong Village	0.28	14.6
1BB1	NR5 (Prey Svay)–Sdok Praveuk	1.16	22.4
1BB2	NR5 (Railway)–Prek Chik–Chong Por	4.68	33.7
1BB3 and 1BB4	NR5 (Chrey)–Talas–Karkos	0.60	16.3
1KS3	Phsar Traepang Kraleung–Phsar Pang Kassey	5.35	30.9
1KS4	Samki Reaksmey–Dak Por	0.67	16.7
266E	Puok–Angkor Chum	9.13	41.5
266D and 2SR2	Leang Dai–Svay Sor	18.07	46.2
KC10 (CW-D)	Pong Teuk–Wat Chhuk	2.18	29.9
KC12-1	Batdei Kraum–Kampong Pruol	0.71	18.1
KC2 (CW-E)	Hanchey–Steung Trang	4.62	62.5
KC11 (CW-F)	Phsar Paav–Trob	7.34	47.2

CW = civil works; EIRR = economic internal rate of return, NPV = net present value, NR = national road.

Source: Asian Development Bank.

13. When all road sections are combined and evaluated as a single project, the EIRR is 38.1% and the net present value \$138.01 million. The annual cash flows of the total project are in Table 5.

**Table 5: Total Project Annual Cash Flows (\$ million)**

Year	Costs		Benefits					Total
	Capital Works	Recurrent Works	Normal Traffic		Non-motorized Traffic Saving	Generated Traffic		
			VOC Savings	Time Savings		VOC Savings	Time Savings	
2012	7.123	0.000	0.000	0.000	0.000	0.000	0.000	-7.123
2013	12.435	-0.048	0.870	0.093	0.031	0.000	0.000	-11.392
2014	10.866	-0.043	-2.023	-0.263	-0.065	-0.101	-0.014	-13.289
2015	-0.300	-0.039	6.938	1.336	0.178	0.400	0.053	9.244
2016	-0.495	-0.034	7.156	1.299	0.159	0.430	0.055	9.628
2017	-0.297	-0.031	6.483	1.282	0.128	0.403	0.056	8.681
2018	-0.396	-0.027	7.414	1.452	0.134	0.435	0.063	9.921
2019	-0.439	-0.025	7.598	1.488	0.142	0.452	0.066	10.210
2020	-0.211	-0.022	6.538	1.398	0.103	0.403	0.063	8.738
2021	2.405	-0.020	6.757	1.408	0.098	0.387	0.057	6.322
2022	-0.313	-0.017	7.704	1.555	0.117	0.443	0.066	10.215
2023	-0.150	-0.016	6.090	1.381	0.076	0.361	0.058	8.132
2024	0.243	-0.014	6.196	1.397	0.074	0.341	0.053	7.833
2025	-0.223	-0.012	6.994	1.503	0.087	0.390	0.060	9.269
2026	-0.107	-0.011	6.173	1.449	0.065	0.374	0.065	8.244
2027	3.559	-0.010	6.118	1.460	0.062	0.323	0.053	4.466
2028	-0.158	-0.009	6.804	1.501	0.068	0.368	0.057	8.965
2029	-0.076	-0.008	6.207	1.460	0.053	0.361	0.062	8.227
2030	-0.102	-0.007	7.107	1.638	0.056	0.364	0.059	9.334
2031	-0.113	-0.006	6.387	1.528	0.050	0.327	0.053	8.465
2032	-0.054	-0.006	5.729	1.462	0.038	0.316	0.057	7.663
2033	-0.072	-0.005	6.476	1.631	0.040	0.317	0.054	8.595
2034	0.123	-0.004	5.871	1.549	0.036	0.288	0.050	7.676

VOC = vehicle operating cost.

Source: Asian Development Bank.

14. The EIRR was analyzed with respect to changes in the benefit and cost streams by means of a sensitivity analysis and calculation of switching values, i.e., the percentage change in a variable that causes the EIRR to be 12%. The results are shown below.

Scenario	EIRR	Switching Value (%)	Sensitivity Indicator
Base case	38.1		
Costs +20%	34.1	415.1	(0.24)
VOC -20%	34.2	(99.3)	1.01
Costs +20% and VOC -20%	30.5	n/a	1.50
Base traffic -20%	33.2	(66.5)	1.34
Traffic growth -20%	34.9	(74.4)	
No time benefits	33.8	n/a	
No generated traffic	37.0	n/a	

n/a = not applicable, EIRR = economic internal rate of return, VOC = vehicle operating cost.

Source: Asian Development Bank.

15. The EIRR is most sensitive to variation in traffic, either base year traffic or the traffic growth rate. Yet, either of these would have to decrease by almost 70% for the project to become unviable. Risk analysis shows that the likelihood of the project not reaching an EIRR of 12% is less than 1%.



## **SUMMARY OF GENDER EQUALITY RESULTS AND ACHIEVEMENTS**

### **I. PROJECT DESCRIPTION**

1. The Rural Roads Improvement Project (RRIP) assists the Royal Government of Cambodia to improve its rural road network mainly around Tonle Sap basin, by rehabilitating 545.3 kilometers (km) of unpaved rural roads to paved condition. The project also aims to strengthen the capacity of the Ministry of Rural Development (MRD) for road maintenance planning, management and monitoring by (i) improving the sustainability of funding for road maintenance; (ii) improving the capacity of private contracting industry; and (iii) by supporting the decentralization process through strengthening the capacity of Provincial Departments of Rural Development (PDRDs). Further, the project aims to assist MRD to establish an axle load control program for rural roads, to design and manage a rural road safety program for the project provinces, and to establish better capacity for social safeguards within MRD. The project makes initial interventions in road design and planning for climate change, emergency preparedness, mitigation, and response.

### **II. GENDER ANALYSIS AND PROJECT DESIGN FEATURES**

#### **A. Gender Issues and Gender Action Plan Features**

2. Cambodia's population in 2013 was 14.68 million with 3.16 million households. Of which, 2.5 million households were rural and 0.66 million were urban. Nearly one-third are headed by women. Remote areas, especially those that become difficult to access by road during the rainy season, are particularly poor. The new official poverty lines introduced in the country in 2013 have shown that the poverty rate fell sharply from 47.8% in 2007 to 22.9% in 2009, 19.8% in 2011, and 18.9% in 2012.

3. In civil works/construction sector, there are more men workers than women workers. Contractors still have gender bias in hiring women workers compared to men workers due to their negative perception that women do not want to work under the sun and engage in dirty and heavy jobs in road construction; that men are faster in working in road construction than women, and that their husbands will not allow them to work in road construction which are dominated by men.

4. The HIV/AIDS prevalence rate in Cambodia fell from 0.9% of the population in 2006 to 0.7% in 2012. With regards to the level of awareness of the local people on HIV/AIDS and prevention methods, about 84% of the women in the country are aware of the HIV/AIDS, and about 90% of men were aware that using condoms when having sex could prevent the spread of HIV/AIDS. The Cambodia Millennium Development Goals Survey 2014 report shows that about 77% of women (and 87% men) have knowledge of HIV/AIDS prevention. The women's level of awareness on HIV/AIDS prevention is slightly lower compared to men.

5. A gender action plan (GAP) has been prepared to ensure that gender mainstreaming indicators will be implemented, to ensure that the local people including women, poor, and jobless women are given jobs during road construction stage; and to ensure that local people could benefit from the project by participating during consultation meetings, decision-making, training and/or capacity building, increase level of awareness in road safety, HIV/AIDS and human trafficking prevention program (HHTPP), climate change, gender, and safeguards. The GAP aimed at (i) capacity development activities to promote better understanding of the differential gender impact of poor infrastructure; provide better access to services and/or facilities (social benefits) in terms of travel and travel patterns, and in mobility outside the home and outside the

village); (ii) mandatory recruitment procedures or quotas in minor works contracts, preceded by sensitization activities targeting both men (to encourage them to allow female family members to participate) and women (to inform them of job opportunities) and other benefits; and (iii) ensuring that contractors adhere to core labor standards during project implementation.

6. The GAP included a number of measures to ensure women's access to project benefits, including participation and empowerment through various project activities. These included:

- (i) Civil works will be based on labor-based appropriate technology (LBAT): contractors will prioritize the use of local skilled labor (through subcontracting);
- (ii) At least 40% of unskilled labor will be female;
- (iii) Male and female unskilled workers will receive equal pay for equal work;
- (iv) Road shoulders will have a sealed bituminous surface enabling carts with wheels to reduce the burden on women and girls who haul water in rural areas;
- (v) At least 50% of road maintenance workers will be women;
- (vi) The project includes an HHTPP to mitigate potential HIV-related impacts during and after construction;
- (vii) Vulnerability mapping for rural roads to improve planning for climate change adaptation will include local women at planning stages;
- (viii) A community-based road safety campaign will involve community members as facilitators, and at least 50% of community facilitators will be women; and
- (ix) Emergency management and early warning systems will engage vulnerable groups (women, disabled persons, etc.), during the planning stages and special provisions will be included for such groups in actual operation of the systems.

## **B. Overall Assessment of Gender-Related Results and Achievements**

7. The gender category of RRIP is effective gender mainstreaming, as per Asian Development Bank (ADB) policy on gender and development. The project includes a GAP to maximize benefits to local populations including women, poor, and vulnerable people in the project areas. By project completion, GAP implementation is rated as *successful* with 93% of actions (13 out of the 14 actions) implemented and completed, and 75% of targets (three out of four targets) have been achieved. Note that one of the targets (at least 50% of road maintenance workers will be women) has been dropped because women's involvement in road maintenance work and the actual implementation of road maintenance takes place after project completion. The implementation results are in Table 1. GAP quantitative and qualitative indicators were integrated into all the project outputs and the social and environmental office (SEO) was established in MRD to overall implement and monitor the GAP with technical support from gender specialists. Contractors have utilized LBAT and hired local residents, achieving a total of 158,000 labor days, with 49,770 labor days (or 31.5%) claimed by women for unskilled labor. The road shoulders with sealed bituminous surface was included in the design to reduce the burden on women and girls. LBAT trainings were conducted in all 71 communes along the RRIP roads with a total number of 1,625 participants, 57.5% (935) were women. 6,625 workers were registered in the registry of labor force (inventory); 48.6% (3,220) of the total registered workers were women. The labor database was provided to all contractors.

8. Considerable interventions were implemented to facilitate women's engagement in civil works. The RRIP—for its target in ensuring women's participation in construction—developed training manuals and information education communication (IEC) materials including a short video clip “Cambodia's Road to Development” that highlighted how improved road networks in Cambodia created milestone opportunities for local women and the rural poor. The video is published online through the ADB website (<https://www.adb.org/news/videos/cambodias-road>).

[development](#)). The video was commended by then Southeast Asia Department Deputy Director General Ramesh Subramaniam for the powerful and well-conveyed message. Moreover, the interventions on promoting women's access to jobs in road construction reached and trained 750 villagers, 6 contractors, 17 local authorities, and 100 MRD staff through social media, community outreach, and trainings on the equal role of women and men in road construction. Women have become aware of available jobs in road construction and contractors have opened their minds in recruiting more women workers. The SEO was established in MRD and qualified as a governmental body in addressing cross-cutting issues including safeguard and gender. SEO is composed of 7 members, including 3 women, demonstrating good practice of equal women participation.

9. To ensure safety of children and pedestrians, road safety signages were installed in all designated locations along the RRIP project areas. A total of 72,365 participated for all trainings and/or public awareness campaign on road safety conducted in the project areas, with about 48% women participation. The HHTPP was implemented with the local communities, contractors, and labor force in the RRIP areas before and during civil works/construction stage. The total of 26,446 of the general population were trained on HHTPP, nearly half were women; 2,482 construction workers trained, 20% were women; 1,654 truck drivers porters trained, 9% were women. 1,507 entertainment workers (all women) have been trained on HHTPP. Of the 13,069 adult community residents that reported correct and consistent use of condoms, 37.2% (4,860) were women. 574 construction workers received Voluntary Counselling confidential and testing (VCCT), 31.3% (180) were women. Women's voices were also enabled through their participation (about 25% of total participants) in the consultation and planning for vulnerability mapping. Total number of PMU staff is 27 including the 8 officers of the SEO (4 are females). Trainings on environment, safeguards, gender, GAP, and HHTPP are provided to SEO and project implementers.

10. Improved road connectivity brings great benefits to the local people including women, elderly, and other vulnerable persons in the project areas. Transport services were enhanced, travel time has been shortened, and more convenient travel was experienced. Women and girls can travel safely from home before night time, as travel time is faster in double bituminous surface treated roads. Quality of rural health, education, and other services have improved given the greater access to basic services and facilities after completion of the road project. Students claimed that they are happy with the improved roads, it is no longer muddy or dusty; they could use their school uniforms for several days compared before the project started (when they or their mothers have to wash their uniforms daily). Girls have better chance of attending secondary schools. More students were observed using bicycles and motorcycles after the road has been improved. Some students affirmed that their parents bought motorcycles for them to use (especially the girls and boys enrolled in secondary schools) after the road has been improved. Before the road improvement project, most were using bicycles when going to schools, and some whose houses are within the 3 km radius usually go to school by foot.

11. The local people including pregnant women could have regular pre-and post-natal services in clinics and hospitals and could safely deliver their babies in health facilities. Before the road improvement project, some women prefer to deliver their babies at home due to bad roads and risks for them and baby, when travel time took more than 2 hours to reach the hospitals in the district proper; there were few cases when mothers deliver the baby prior to reaching the hospital or clinic. Roads with many potholes is also risky on the health of pregnant women. Local people are also at risk of road accidents as road users have the tendency to avoid potholes on the roads, which are not visible at night.

12. Markets are easier to reach and trading opportunities for women could increase. Better roads bring more customers to the area thus, resulting to increase in profit and/or household income; and better opportunities for the local people especially the women to engage in small enterprises in areas along the project roads. After the road has been improved, new houses, banks, gas stations, small business shops and/or stalls, restaurants, and other kinds of businesses have been observed along the RRIP road sections. The businessmen and local people interviewed affirmed that their profit had increased after the road has been improved because the number of road users also increased. Likewise, no more dust and flood in front of their shops after the improvement of the rural roads. The business owners were able to increase the variety of good and products for sale including selling cooked or grilled foods (meat, banana, etc.), coconuts (juice), clothing, fruits and vegetables. The profit they earned from business was increased to an average of \$10.00 to \$20.00 per day due to increase in the number of customers.

### C. Gender Equality Results

#### 1. Participation, access to project resources and practical benefits

13. The project delivered the following key results related to the targets:

- (i) **Project Road Rehabilitated:** Contractors have utilized LBAT and hired local residents including women for unskilled jobs. Labor-based types of jobs were available mostly during the initial stage (preparation, clearing, construction of box and/or pipe culverts, planting trees, etc.). Women claimed a total of 49,770 labor days, which is about 31.5% of the labor days under unskilled work (8.5% below the ambitious target of 40%). The contractors complied with the core labor standards including no child labor and equal pay for men and unskilled women workers. The road shoulders with sealed bituminous surface was included in the design. Additionally, the contractors provided additional assistance to the local people in areas wherein some houses are located lower than the road embankments by improving the pathway from the main road to their houses.

#### Case Study 1: Women Unskilled Workers in Kampong Cham Province

Mrs. Tith Kim Hean and Mrs. Dim Thol, local residents in the road improvement areas, were employed as unskilled laborer in RRIP. Both are in their 30s and married with two children. Both of their husband are farmers. Prior to their engagement in road construction, Hean and Thol supported their husbands in planting and harvesting, but agricultural activities is seasonal and income from it alone could not meet family's needs, so both of them, and their husbands, try to find other jobs to augment their income. Hean and Thol were informed by commune chief about the available jobs in RRIP road project and were oriented on kinds of job by foreman, thus, they felt that they can do the work. They also gained support from their husbands who used to work in construction and understand the nature and condition of the work. Hean and Thol have no experience in construction work, but contractors offered them on-the-job training, which was so helpful to enable them to work. They performed tasks such as road clearing, tying steel bars, and sometimes performed the role as flag person (for road safety), which they claimed they liked.

Unlike agricultural activities, Hean and Thol received their regular weekly wage from the contractor for \$37.50, which is sufficient to meet their daily basic household needs. Each month, she could save between \$30 to \$50 to use when they do not have jobs.

In case they needed cash during emergency situation (i.e. to buy medicines for household member who is sick, or education of children), they could avail of cash advance from the contractor, who was easy to deal with. They did not have to borrow money from the banks or credit cooperatives if they advance their salary from the contractor. They were aware that the duration of work in road construction was for a short period only. However, the skills and knowledge they learned from road construction could be used for a longer period. They could apply those skills in future related civil works, once they have no more jobs from the road project. They further stated that the skills they learned could also be used even in-house construction jobs in the commune.



(left to right): Mrs. Tith Kim Hean (1st female unskilled worker); Pen Thay (Gender Specialist), Ester Felix (Social/Gender Specialist), and Mrs. Dim Thol (2nd female unskilled worker).

- (ii) **Improved MRD road asset management:** LBAT training modules with topics on gender mainstreaming, type of jobs in civil works for local people including women, etc. were prepared and updated. LBAT training was conducted in all 71 communes located along the RRIP roads. There were 1,625 participants in LBAT trainings, including 935 women. Registry of labor force (men and women interested to be hired by the contractors in civil works) was prepared and all contractors and commune chiefs in all communes along the RRIP roads were provided with copy, for their reference. A total number of labor force who registered in the registry of labor force (inventory) was 6,625 (53.05% women).
- (iii) **Increased road safety awareness and potential social impacts:** Road signs approved by MRD were installed in all designated locations along the RRIP project areas. All school zone markings in the 25 schools in 7 provinces (now 8 provinces) have been completed. Oversized vehicle barriers and direction signs, and other road safety signs along the RRIP road sections have been installed. Posters on HIV/AIDS prevention, leaflets on HIV/AIDS and human trafficking were developed and used to promote awareness. There was a total of 72,365 participants for all trainings and/or public awareness campaign on road safety conducted in the project areas, with 48% women. HHTPP was implemented with the local communities, and contractors and labor force in the RRIP areas before and during civil works/construction stage. Total number of general population trained were 26,446, 49% women; 2,482 construction workers were trained, with 20.04 women

participation; 1,507 entertainment workers trained were all women; 1,654 truck drivers porters trained (9.0% women). A total of 156,982 condoms were distributed to workers and local communities. Of the total 13,069 adult community residents that have reported correct and consistent use of condom, 37.2% were women. 574 construction workers have received VCCT, 31.3% women. 6,775 pregnant women received Prevention from Mother to Child Transmission training/awareness. 9,427 individuals received VCCT, 54% were women.

- (iv) **Reduced vulnerability of project road to climate change:** About 25% of the participants in consultations and planning for vulnerability mapping for rural road to improve planning for climate change adaptation were women. Emergency management plan has been prepared with provisions that vulnerable groups will be engaged in the emergency management and early warning systems, and that it is essential to involve women during the planning stage.
- (v) **Efficient Project Management:** Total number of PMU staff is 27, including 8 officers of the SEO of which 4 are females. The PMU staff participated in the following trainings were conducted: (a) training on SEO overview/functions; environment, safeguards, gender, GAP, and HHTPP, participated by 38, (with 2 women from the gender technical working group), (b) training on Gender Mainstreaming, GAP monitoring and reporting; and safeguard policy of ADB for the SEO officers, (c) workshop on Gender and ADB Safeguard Policy for the 3 line agencies, SEO, the Ministry's Gender Working Group and contractors implementing the ADB Flood Damage Emergency Reconstruction Project (FDERP)<sup>1</sup> (MRD, the Ministry of Public Works and Transport, and the Ministry of Water Resources and Meteorology), (d) workshop on LBAT; use of IEC Materials on Gender Mainstreaming, (e) follow-up training and orientation for the SEO on safeguards and GAP monitoring every quarter during Safeguards and GAP monitoring for RRIP projects; and (f) sex-disaggregated indicators and data included in GAP monitoring; GAP quarterly progress reports and RRIP's quarterly progress reports.

**Case Study 2: Project Manager's (contractor) Experience on Gender Mainstreaming in ADB and MRD Road Projects (RRIP and FDERP/FDERP Additional Financing)**

Mr. Nouv Channarin, is a former project manager of a subcontracting local firm in RRIP in Kampong Thom province and currently a project manager of Borey Kamkor Construction Co., Ltd., contractor for contract package CW16B (in Banteay Meanchey province) of the ADB Loan 3125-CAM (footnote 1) and the Government of Australia for the FDERP-Additional Financing.<sup>2</sup> He was also assigned in one contract package in Prey Veng province under Loan 3125-CAM. He has 23-years of work experience as an engineer/contractor in civil works. Channarin always assumed that women are not interested to work in road construction, so it is difficult to recruit women from the commune. He preferred recruiting men as he believed men can work faster than women.

<sup>1</sup> ADB. 2012. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the Kingdom of Cambodia for the Flood Damage Emergency Reconstruction Project*. Phnom Penh.

<sup>2</sup> ADB. 2014. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the Kingdom of Cambodia for the Flood Damage Emergency Reconstruction Project-Additional Financing*. Phnom Penh.



Channarin received training on gender equality and promoting women's access to jobs in rural road construction and maintenance, conducted by SEO through RRIP. Under Loan 3125-CAM and Grant 0285-CAM (footnote 2), he received other gender mainstreaming training including on core labor standards. It took him some time to positively change his perception on women's engagement in construction. Yet, the project required the contractors to recruit at least 40% of women. During the process of conducting capacity building (on labor-based related jobs) and supervising the construction workers, he observed that women have positive attitudes and the capacity to learn new skills compared to men during training (i.e. tying steel bars, making concrete spacers, surveying, road measurement, etc.). Women are more patient than men in the type of work assigned to them. *"When women work, they really work, as they have no vices – don't smoke nor drink wine and are more focused on their job which resulted to quality work"*, said Channarin. He also observed that women (both for skilled and unskilled jobs) whom he trained could learn fast and are efficient in their job.

Channarin hired local people including women for unskilled and skilled jobs. For Grant 0285-CAM road project in Banteay Meanchey province, he hired more than 30% women unskilled labor from the communes in the project area. Channarin trained women how to tie steel bars, make concrete spacers used for box and pipe culverts, bridges, and how to do road measurement. He also hired skilled women to do jobs in his office (i.e., making drawings, surveying, and other administrative work at the office).

Channarin observed that there are more women than men in the villages who are jobless; and higher number of poor women in rural areas (the fact that the female population is higher than male population in Cambodia). He is optimistic and confident that even if the road project has been completed, he will continue to support gender mainstreaming; hire local people especially the poor and unemployed women to increase their income.



Mr. Nouv Channarin (wearing eyeglasses)

## 2. Strategic changes in gender relation

14. Better road access confers increased women economic empowerment and changes in gender relations in some key domains such access to markets, income generating activities, education and gender division of labor. A rapid assessment conducted in 2017 to assess an initial impact on gender equality results confirmed that women's incomes have increased almost double

after the road improvement. The increase in women's income contributed to changes in gender relations at individual level and household level on shifting stereotypical gender roles. *"our husbands have begun helping us with productive work since we engaged in income generating activities"* said Pheary and Rompear (female beneficiaries). Linking to these increases in economic benefits, the study confirmed that women have experienced increased levels of empowerment in decision-making areas. *"Women felt that engaging in economic activities enabled them to have a voice in decision making at home"*, said the women. The study also confirmed the positive impact on child education through better roads and increase in women's income. The social marketing and training initiatives on the promotion of women employment in rural road improvement have contributed to the transformative changes of gender relations at individual and community level. Women have become more aware of available jobs in rural road construction. Contractors are now more open-minded in recruiting more women workers and MRD's officials have increased their capacity in mainstreaming gender in rural road infrastructure projects. For instance, 31.5% of the total 158,000 labor days for unskilled labor were claimed by women, which is considered as high in a traditionally male-dominated construction work.

### **Case Study 3: Shop Owners Along the Rural Road in Pursat Province**

Mr. Chun and Mrs. Oun, a 65-year old couple residents with five children living in Pursat province, have opened a grocery shop three years ago before the project road construction. Prior to road improvement, the road section in front of their shop and many other sections become muddy during heavy rains and very dusty during dry season, which made their goods looked dirty and unattractive. There were also few customers due to difficult road. They generated around \$10 income per day. Furthermore, it took them more than 2 hours to travel to market and transport products for the stock, adding more cost to their business.

The shop owners were very happy of the improved roads. *"It is very useful for our business in a number of ways. For instance, it takes me only 30 minutes to buy more stock from nearby market. We could save from gasoline expenses, and time to do more productive tasks at home and in the shops (i.e., attending to their grandchildren whose parents are working outside the commune; managing their shop; and perform other household chores). Since the road has been improved, we observed an increase in number of road users; consequently, we received more customers. Now, we are expanding our business by selling additional products including coconuts (coconut juice for snacks), cooked or grilled foods (meat), vegetables, and clothing. We could earn an estimated profit ranging from \$15.00 to more than \$25.00 daily"*, said the couple.





Mrs. Oun and Mr. Chun (2nd and 3rd from left) were interviewed by the social and gender specialists (Ester Felix and Pen Thay) during the GAP monitoring in April 2014.



The shop has more goods for sale (soft drinks, snacks, cooked/grilled foods, coconuts/coconut juice and other kinds of drinks, various kinds of goods, and ready-to-wear clothes).

#### **Case Study 4: Vegetables and Fruits Vendors along the RRIP Road (3 additional roads/contract package) in Kampong Cham Province**

Mrs. Mao Srey Rath is 50 years old, married, and has 4 children (2 boys and 2 girls). She and her husband, together with her relatives are engaged in agriculture, which is their primary source of income. They have planted watermelon, winter melon, squash or pumpkins, and other kinds of vegetables on a 0.5 hectare for over 5 years. Before the road was improved, it was costly and took time to transport their products to market as they have to rent a truck to transport their produce. There were also few buyers due to inaccessible road, especially during raining season. Rath and her husband experienced spoilage of vegetables during a long period that they could not bring products to the market, which is located about 10 km from the farm. Due to few buyers, they experienced low bargaining power, receiving low price for their produce, and sometimes, they would end up bringing their products home if they were not sold.

With the improved road, there has been increase in number of road users and buyers. Rath and her family built a temporary structure in front of the farm where they could easily sell their harvest. Buyers directly go to them to buy produce right at their farm. Some local residents in nearby communes and local tourists who pass by going to Kampong Cham are also potential customers. The improved road has contributed to reduced production cost and increased produce price resulting from more buyers. They could now sell winter melon and watermelon and earned an average of \$100.00 for 2 days or at least \$50.00 per day during harvesting days. The couple observed that more residents built temporary structure selling their produces along the road too, while other farmers transport their produces directly to market in Kampong Cham town. They also noticed that the improved road network allowed children to easily go to school and access to the nearest health center/hospital located in Kampong Cham province.



Mrs. Mao Srey Rath, vegetable vendor along the road in Kampong Cham province.

15. The project has built the capacity of 351 women to act as community facilitators to deliver community-based road safety campaign, where women have increased their visibility in community work. These led to the increase in women's confidence and gained community respect that overall contributed to benefit women in their daily lives. The project contributed directly to increase women participation in decision-making at project level by creating an opportunities and space for women to freely articulate their concerns and interests during project planning, designing and implementation to ensure maximized positive impact for them. In this regard, women were accounted for 25% of the total participants in the vulnerability mapping for rural roads.

16. The project contributed to the successful establishment of SEO, who plays pivotal role in MRD in addressing and monitoring related issues to resettlement, environment, indigenous peoples, and social and gender concerns to rural road construction projects. SEO received the capacity building on safeguard policies, gender mainstreaming, core labor standards, and occupational health and safety standards (use of personal protection equipment such as helmets or hard hats, closed shoes, gloves, masks, etc.). First-aid kits, proper sanitation, and gender-sensitive facilities at the construction sites (i.e. separate toilets for men and women) are provided. SEO has become a role model as a governmental body in addressing cross-cutting issues including safeguard and gender. SEO in MRD demonstrates good practice of equal women participation; among 7 staffs of SEO, 3 are women.

### **3. Contribution of gender equality results to overall loan outcomes and effectiveness**

17. The community-based road safety campaign and safety design features, all required by the GAP, has been instrumental in contributing to the outcome indicator of reducing the number of road accidents in Cambodia by 65%, from 12,538 in 2009 to 4,353 accidents in 2013. Women's participation and inputs in consultations have ensured that roads have been built to be safe, accessible, and convenient for the use of everyone – including women and vulnerable groups like children and the elderly.

18. Gender designed features have been prepared to ensure that the local people including women and the poor are included in economic growth through roads improvement, linking them up with new economic opportunities, market, and social services including healthcare and education. Roads construction was encouraged to use LBAT and women are given jobs during road construction and maintenance. To maximize the positive impact, women are engaged in

road safety awareness and HHTPP campaigns, LBAT capacity building and community consultation. Moreover, SEO was established in MRD to address issues related to gender, resettlement, environment, and indigenous peoples. Gender designed features have contributed to achieving the overall outcome of the project by ensuring inclusive economic growth and poverty reduction.

### III. LESSONS LEARNED AND RECOMMENDATIONS

19. Several factors were critical to the successful achievements of GAP targets and actions including:

- (i) LBAT trainings conducted in all communes contributed to increasing awareness of the local people on gender mainstreaming; types of jobs that women could do in civil works; and importance of GAP/ gender mainstreaming;
- (ii) training on safeguards, core labor standards, gender mainstreaming/GAP monitoring and HHTPP to the contractors provided them guidance on how to comply with the safeguard and gender requirements and documentation;
- (iii) regular coordination with the SEO, contractors and DDIS consultants in all project outputs, for the preparation of GAP quarterly progress reports, field visits, GAP, safeguards monitoring, etc.;
- (iv) regular coordination and consultations with the commune councils; focus group discussions conducted with the local people/women, schools, etc.;
- (v) sex-disaggregated data collection, analysis and in preparation of reports are essential (should be integrated in all reports – monthly and quarterly);
- (vi) establishment of the SEO and capacity building trainings; active involvement of the staff in GAP/safeguards monitoring and other activities; and
- (vii) positive attitude of the people and officers in MRD/PMU/SEO and DDIS and professional commitment and hard work – could strongly influence the contractors, commune leaders, other agencies, and the local people.

20. **Sustainability:** The knowledge learned by the project implementers and other stakeholders will be long-term as it could be applied even after the end of the project. The SEO were provided training about their functions relevant to safeguards and gender mainstreaming, monitoring and preparation of reports (with sex-disaggregated data) which they will surely continue in their work in MRD, even after the end of the RRIP. As of project completion date, the SEO team were very active conducting LBAT for the local people along the RRIP II, and they also conducted the same training and gender awareness in the Loan 3125-CAM project areas. The gender staff of the SEO have developed the necessary competencies on safeguards and GAP monitoring, conduct of capacity building in the local communities, coordination with the commune councils, contractors, PDRDs, and the local people. The gender staff of the SEO also have trainings on other project outputs related to road safety, climate change, safeguards, use of training modules and IEC materials. Three training manuals and IEC materials were produced under the Gender and Development Cooperation Fund technical assistance Promoting Women's Access to Jobs in Rural Road Construction and Maintenance" (also known as "Ready for Road"). The TA was implemented parallel and attached to the RRIP to improve the performance of the contractors in-term of engaging women in unskilled works, as well as to support the GAP implementation.

21. For the civil works, the knowledge and skills learned by the local people including women during the LBAT trainings, and follow-up training provided by the foremen/contractors who hired women during the construction stage, could be used in future construction related jobs. They

could be hired by the contractors for road maintenance after the 1-year defect liability period, and/or during the road maintenance stage.

22. For climate change, the local people including women, and partner agencies were provided training on early warning system, and other climate change related topics that could be used even after the completion of the project. The facilities and/or structures constructed (including ponds) will contribute to disaster preparedness and quick response which have long-term benefits to the local people especially during drought or dry season.

23. The public awareness campaigns on road safety and HHTPP accessed by the local people, students and teachers, and local leaders (districts, communes, etc.) will also have long-term impacts in preventing road accidents and social repercussions of newly improved road access. A continued awareness campaign is essential to ensure that the students, local people, and other stakeholders will be aware of the road safety measures to save lives and prevent accidents. The roads signs installed along designated road sections and rumble strips, pedestrian lanes, etc. are very useful for the students and local people, and road users.

24. For the contractors, the knowledge and skills learned from civil works, gender mainstreaming, core labor standards, use of personal protective equipment, implementation of safeguard measures including environmental monitoring plan, road safety signs, and how to prevent dust are useful during project implementation. Capacity building trainings and awareness raising activities could be further applied in future road projects and contracts with MRD and other agencies.

25. Having a well-coordinated and active Project Team (PMU, SEO, PDRD, DDIS, etc.) working closely with the contractors and local people is a laudable effort that need to be sustained. MRD has this excellent quality and competence, and management that could be sustained in future projects. Conducting regular meetings and capacity building trainings on gender mainstreaming and GAP are essential as well, which MRD has been consistent during the project implementation stage. This is favorable to all parties and/or agencies involved in the project.

26. **Recommendation:** Based on the lessons learned in RRIP, the following are the key recommendations for future road projects.

- (i) GAP target indicators. The experience in the RRIP have shown that the 40% target for unskilled women participation in civil works is too high and that important influencing factors should be considered at design stage. In spite of the best efforts by contractors in hiring women, 31.5% labor days claimed by women out of a total of 158,000 labor days under unskilled work was achieved at the end of civil works. Underlying factors and challenges were explained in Table 4. For the RRIP II, the target percentage of women in civil works was reduced to 20%, as a result of the lesson learned from RRIP project implementation.
- (ii) Capacity building for the contractors and staff, and other project implementers need to be sustained in RRIP II and similar road projects. Turnover among contractors' staff is frequent and participants who attended the previous trainings in RRIP may not be the same in RRIP II or in other road projects. There is also a need to update their learning on those topics and ensure that they consciously adhere to the requirements in civil works, core labor standards, GAP, among others. Contractors have to be reoriented on how to prepare reports with sex-disaggregated data especially in all types of works and activities including those related to climate change output.

- (iii) LBAT trainings for the local people should include women and needs to be sustained in future road projects. These capacity-building activities provided opportunity for the local people and contractors to increase their level of awareness on gender mainstreaming, and types of jobs that men and women unskilled workers can do. While there is no assurance of hiring in civil works, the knowledge and skills learned from the trainings are useful for similar construction jobs in the future. The trainings also provided awareness for the contractors on basic gender equality and women empowerment, on capacities of what women and cultivated positive attitude on gender mainstreaming (so that they will be motivated to hire more women in civil works).
- (iv) Establish a well-coordinated and active Project Team (PMU, SEO, PDRD, DDIS, etc.) working closely with the contractors, local people, and various stakeholders is a commendable effort that need to be sustained. MRD has an excellent quality and competence on gender mainstreaming and implementation of the GAP and could be used as a model worthy to be emulated by other agencies.

Table 1: GENDER ACTION PLAN MONITORING TABLE

<b>Project Title:</b>	Rural Roads Improvement Project (RRIP)
<b>Country:</b>	Cambodia
<b>Project No.</b>	42334
<b>Type of Project (Loan/TA):</b>	Loan 2670
<b>Approval and Timeline:</b>	January 2011–June 2016
<b>Gender Category:</b>	Effective Gender Mainstreaming (EGM)
<b>Mission Leader:</b>	Shihiru Date and Takeshi Fukayama, SETC
<b>Project Impact:</b>	Improved access to markets, jobs, and social services in seven project provinces
<b>Project Outcome:</b>	Safe, cost effective, all-year road access provided in remote agricultural areas in seven provinces of the Tonle Sap Basin

<b>Activities, Indicators and Targets, Timeframe and Responsibility</b>	<b>Status of GAP Indicators / Progress to Date</b> <i>(This should include information on period of actual implementation, sex- disaggregated qualitative and quantitative updates (e.g. number of participating women, women beneficiaries of services, etc.))</i>	<b>Issues and Challenges</b> <i>(Please include reasons why an activity was not fully implemented, or if targets fall short, or reasons for delay, etc.)</i>
<b>Output 1. Project Roads Rehabilitated</b>		
<p>Civil works will be based on LBAT: contractors will prioritize the use of local unskilled labor (through subcontracting)</p> <p><b>Responsibility:</b> PMU &amp; PIU with support from consultants</p> <p><b>Time:</b> Year 1–4 (2011–2014)</p> <p><b>Action 1: Achieved</b></p>	<ul style="list-style-type: none"> <li>Contractors have utilized LBAT, and hired local residents including women for unskilled jobs, accounted for 158,000 labor-days. Labor-based type of jobs were available mostly during the initial stages (preparation and clearing, construction of box/pipe culverts, planting trees, etc.). They also hired local people about 5.0% of the total skilled labor force come from the local communities for jobs such as driver (1 driver is a Cham by ethnicity residing in Tuek Phos district, Kampong Chhnang province); foremen and female office workers doing accounting and clerical related tasks.</li> </ul>	
<p>At least 40% of unskilled laborers will be female</p> <p><b>Responsibility:</b> PMU &amp; PIU with support from consultants and contractors</p> <p><b>Time:</b> Year 1–4</p>	<ul style="list-style-type: none"> <li>49,770 labor days (31.5%) out of a total 158,000 labor days under unskilled work has been claimed by women</li> <li>The contractors also hired the services of women for skilled jobs (i.e. office workers, accountants, engineers, etc.), 8.0% in total in all contract packages or total cumulative person days of</li> </ul>	<p>The RRIP is the first initiative that sought to implement women's participation in civil works. A pioneer project approved in 2010, RRIP endeavored to promote women employment in construction work, a traditionally male-dominated sector. While the project fell short of the 40% target, achieving</p>

Activities, Indicators and Targets, Timeframe and Responsibility	Status of GAP Indicators / Progress to Date (This should include information on period of actual implementation, sex- disaggregated qualitative and quantitative updates (e.g. number of participating women, women beneficiaries of services, etc.)	Issues and Challenges (Please include reasons why an activity was not fully implemented, or if targets fall short, or reasons for delay, etc.)
<b>Target 1: Not Achieved</b>	<p>22,524 during the construction period.</p> <ul style="list-style-type: none"> <li>A video entitled “Cambodia’s Road to Development” illustrates how improved road networks in Cambodia created milestone opportunities for local women and the rural poor. (<a href="https://www.adb.org/news/videos/cambodias-road-development">https://www.adb.org/news/videos/cambodias-road-development</a>).</li> </ul>	<p>31.5% of women’s unskilled labor employment is no mean feat.</p> <p>When the project began, there was a pervasive bias against women working in the construction industry as unskilled laborers. First, some contractors preferred male workers, particularly their own laborers/staff who already have experience in construction works. Consequently, since women had no experience in construction work, they had no chance at all to be hired. Second, women were perceived either as uninterested or unable to do construction work – toiling under the heat of the sun – and would work slower than men. Third, contractors were also of the impression that women will not allowed by their husbands to work in road construction because it is male-dominated.</p> <p>In addition to these gender biases, the presence of other job opportunities veered women away from construction work. These work opportunities for women included (a) agricultural work, especially since civil works also coincided with the planting and harvesting season which was the main source of income in the project areas; (b) competitive jobs in garment factories, rubber plantations, hotels and other service related jobs were preferred specially by younger women, because of long-term work tenure and higher salary compared to civil works (which is on a short-term basis only). Migration to adjacent countries where slightly higher salaries were</p>



Activities, Indicators and Targets, Timeframe and Responsibility	Status of GAP Indicators / Progress to Date (This should include information on period of actual implementation, sex- disaggregated qualitative and quantitative updates (e.g. number of participating women, women beneficiaries of services, etc.)	Issues and Challenges (Please include reasons why an activity was not fully implemented, or if targets fall short, or reasons for delay, etc.)
		<p>available was also a push factor for many village women. Older women of course preferred to stay at home to take care of grandchildren and sick household members.</p> <p>Despite these challenges, it appears that, as revealed by one of the hired women, “jobless women are willing to work if there are available jobs and they will be hired by the contractors.”</p> <p>So, to respond to such challenges, the project conducted extensive information and education campaigns to encourage women’s participation in civil works. It developed training manuals and IEC materials (see progress report under Action 5). The initiatives on promoting women’s access to jobs in road construction reached and trained 750 villagers, 6 contractors, 17 local authorities and 100 MRD’s staffs through social media, community outreaches and trainings on equal role of women in road construction. Women have become more aware of available work opportunities for them in road construction and contractors are now more open minded in recruiting more women.</p>
<p>Male and female unskilled workers will receive equal for equal work</p> <p><b>Responsibility:</b> PMU &amp; PIU with support from consultants and contractors</p> <p><b>Time:</b> Year 1–4</p>	<p>The contractors complied with the core labor standards, including equal pay for the same type of work for male and female unskilled workers were provided equal pay for the same type of work.</p> <p>Contractors also participated in Training on Safeguards, Gender/GAP implementation (where including compliance of core labor standards and</p>	



Activities, Indicators and Targets, Timeframe and Responsibility	Status of GAP Indicators / Progress to Date (This should include information on period of actual implementation, sex- disaggregated qualitative and quantitative updates (e.g. number of participating women, women beneficiaries of services, etc.)	Issues and Challenges (Please include reasons why an activity was not fully implemented, or if targets fall short, or reasons for delay, etc.)
<b>Action 2: Achieved</b>	importance of compliance were discussed), conducted by the MRD/ SEO, DDIS consultants, and ADB CARM.  Lastly, there has been no reported violations of this policy until the end of the project period.	
Contractors will not employ child labor on civil works contracts  <b>Responsibility:</b> PMU/PIU & contractors  <b>Time:</b> Year 1–4  <b>Action 3: Achieved</b>	<ul style="list-style-type: none"> <li>The contractors complied with the core labor standards, did not hire child labor in civil works contracts and other kinds of jobs during the project implementation period.</li> <li>Contractors participated in Training on Safeguards, Gender/GAP implementation (including compliance of core labor standards) conducted by the MRD/ SEO, DDIS consultants, and ADB-CARM</li> <li>No reported violation on the core labor standards.</li> </ul>	
Road shoulders will have a sealed bituminous surface enabling carts with wheels to reduce the burden on women and girls who haul water in rural areas.  <b>Responsibility:</b> PMU & PIU with support from consultants and contractors  <b>Time:</b> Year 1–4  <b>Action 4: Achieved</b>	<ul style="list-style-type: none"> <li>This was included in the road design. The local people along the road appreciated the design and construction as it convenient for them in transporting agricultural products, etc. The information below could explain the situation of sources of water supply in rural areas covered by the RRIP.</li> <li>In addition to construction of road shoulders with sealed bituminous surface, the contractors provided additional assistance to the local people in areas where in some houses are located lower than the road embankments by improving also the pathway from the main road to their houses. The local households interviewed stated that they talked with the contractor/ staff who willingly provide their request without additional cost. This</li> </ul>	Sources of water in rural areas are mostly ring wells, pump wells located near the houses of the residents. Most of the local people (both sexes) were observed fetching water from sources using pails or handy water containers (no carts with wheels). Sources of water are either located beside their houses or along road sides (for ponds/ borrow pits); without crossing the roads. Baseline data for RRIP, 52.0% of households get water from ring well, dug well/open well; 12% of households/respondents get water from ponds/ borrow pits; rivers, etc.

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	was observed especially in Kampong Speu and Kampong Chhnang province (CW-B).	
<b>Output 2: Improved MRD Road Asset Management</b>		
<p>Capacity of the local contracting industry will be built on gender and LBAT</p> <p><b>Responsibility:</b> PMU/SEO staff supported by consultants</p> <p><b>Time:</b> Year 1–4</p> <p><b>Action 5: Achieved</b></p>	<ul style="list-style-type: none"> <li>Three training manuals (Training of trainer, contractors and community people) and IEC materials were produced under GDCF RETA 6143 called “Promoting Women’s Access to Jobs in Rural Road Construction and Maintenance” (also known as “Ready for Road”). The TA was implemented parallel and attached to the RRIP to improve the performance of the contractors in-term of engaging women in unskilled works as well as to support the GAP implementation. The training manuals also included provision on gender mainstreaming concept to indicate how women’s participation and what kind of jobs that women should do in construction; it used as key training materials to provide SEO staff, contractors and local authorities, and community people.</li> <li>This training is known as “Ready for Roads” or project likes to call it as “LBAT”</li> <li>LBAT trainings were conducted in all 71 of the communes located along the RRIP roads. And, all contractor’s key staff received LBAT training. Commune councilors and community people also received this training.</li> <li>1,625 participants, 57.5% or 935 are women, received LBAT training</li> </ul>	
<ul style="list-style-type: none"> <li>A labor force database will be available for contractors, and PDRDs will be able to track the use of local labor</li> </ul>	<ul style="list-style-type: none"> <li>Local labor-based registry (men and women interested to be hired by the contractors in civil works) was prepared and all contractors and commune chiefs in all communes along the RRIP roads were provided with copy, for their</li> </ul>	<ul style="list-style-type: none"> <li>Labor force database was submitted to the contractors and PDRDs in RRIP areas.</li> </ul>

<b>Activities, Indicators and Targets, Timeframe and Responsibility</b>	<b>Status of GAP Indicators / Progress to Date</b> <i>(This should include information on period of actual implementation, sex- disaggregated qualitative and quantitative updates (e.g. number of participating women, women beneficiaries of services, etc.)</i>	<b>Issues and Challenges</b> <i>(Please include reasons why an activity was not fully implemented, or if targets fall short, or reasons for delay, etc.)</i>
<p><b>Responsibility:</b> PMU/SEO staff supported by consultants</p> <p><b>Time:</b> Year 1–2</p> <p><b>Action 6: Achieved</b></p>	<p>reference.</p> <ul style="list-style-type: none"> <li>6,625 people, 48.6% or 3,220 are women, registered in the list of local labor-based registry</li> <li>PDRDs and SEO with support from DDIS consultants assisted in monitoring the use of local labor by the contractors. Contractors were always reminded to hire local people including women during monitoring/ site visits.</li> </ul>	<ul style="list-style-type: none"> <li>It is an issue of job's expectation from the local people. Only few jobs were available or recruited by contractors or those already got another job when construction started</li> <li>For RRIP II, there is a need to involve the contractors in the LBAT training so that they could explain to the local people the number of jobs needed, type of jobs and when hiring will commence. Also, the commune leaders assisting the DDIS consultants and SEO for the registry of labor force need to be re-oriented on its purpose (and that only those who are willing to work, need jobs should sign). Informing the people and the commune leaders about the number of jobs needed, type of jobs and when hiring will commence are essential so that the local people will know the limitations in civil works (especially the number of jobs/ labor force needed during the construction stage).</li> </ul>
<p>A road maintenance action plan for MRD and PDRDs will support a sustainable road maintenance regime, with works delegated to rural communities through small community contracts.</p> <p><b>Responsibility:</b> PMU&amp;PIU staff supported by consultants</p> <p><b>Time:</b> Year 1–4</p> <p><b>Action 7: Achieved</b></p>	<ul style="list-style-type: none"> <li>MRD's draft policy for rural roads commits MRD to encourage appropriate technology for the development and maintenance of rural roads favoring local laborers and materials, but without undermining quality and cost. MRD employs equipment-based methods, labor-based, and labor-intensive methods for road construction and maintenance. Employment is an important matter for the government and labor-based methods such as length-workers can lead to effective road maintenance.</li> </ul>	<ul style="list-style-type: none"> <li>Note: This outcome is to support the MRD to develop road maintenance action plan/ manual and improve MRD's capacity on road asset management. This is not the actual implementation of road maintenance work. The project has one-year defect liability after construction completion.</li> </ul>

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<p>At least 50% of road maintenance workers will be women</p> <p><b>Responsibility:</b> PMU supported by consultants and contractors</p> <p><b>Time:</b> Year 1–4</p> <p><b>Target has been dropped</b></p>	<ul style="list-style-type: none"> <li>The requirement to recruit at least 50% of women in road maintenance was specified in section 3.3 rural road construction and maintenance methods. The MRD will ensure the target is implemented.</li> </ul>	<ul style="list-style-type: none"> <li>Note: Target 2 has been dropped because women's involvement in maintenance work and the implementation of road maintenance activity will start after one-year defects liability period.</li> </ul>
<p>Child labor will not be employed for road maintenance</p> <p><b>Responsibility:</b> PMU supported by consultants and contractors</p> <p><b>Time:</b> Year 1 – 4</p> <p><b>Action 8: Achieved</b></p>	<ul style="list-style-type: none"> <li>The requirement on no child labor for road maintenance was specified in section 3.3 rural road construction and maintenance methods.</li> </ul>	<ul style="list-style-type: none"> <li>Note: This outcome is to support the MRD to develop road maintenance action plan/ manual and improve MRD's capacity on road asset management. This is not the actual implementation of road maintenance work. The project has one-year defect liability after construction completion.</li> </ul>
<b>Output 3: Increased Road Safety and Awareness of Potential Social Problems</b>		
<p>For the safety of children and pedestrians, all (100%) project roads will have speed bumps to slow down traffic in villages</p> <p><b>Responsibility:</b> PMU/PIU &amp; contractors</p> <p><b>Time:</b> Year 1–4</p> <p><b>Target 2: Achieved</b></p>	<ul style="list-style-type: none"> <li>Installation of road markings and other safety features in all school zones in marking of 25 schools in 7 provinces (now 8 provinces) have been completed.</li> <li>Safe school zones were identified and provided with equipment such as retractable speed humps, which are rolled out at the start and end of the school day to slow vehicles to 30 km per hour and stop them at zebra crossings.</li> </ul>	
<p>All (100%) project roads will include road safety signage</p> <p><b>Responsibility:</b> PMU/PIU &amp; contractors</p>	<ul style="list-style-type: none"> <li>100% of the roads installed road safety signage. Road signs approved by MRD were installed in all designated locations along the RRIP project areas. The 5 contracts have been equipped with proper road signs and safety features and 100%</li> </ul>	

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<p><b>Time:</b> Year 1 – 4</p> <p><b>Target 3: Achieved</b></p>	<p>completed.</p> <ul style="list-style-type: none"> <li>All school zone marking of 25 schools in 7 provinces (now 8 provinces) have been completed. Oversized vehicle barriers and direction signs, and other road safety signs along the RRIP road sections have been installed. Contract CW-G: Minor Civil Works for Road safety started on 1 March 2016 and completed on 21 June 2016.</li> <li>In total, the project installed 1981 traffic signs along all the 23 project roads including the safe school zones. A stakeholders meeting was organized on the traffic sign installation (source: SweRoad 2016, Community based Road safety program final report)</li> </ul>	
<p>A CBRSP campaign will involve community members as facilitators, and at least 50% of community facilitators will be women</p> <p><b>Responsibility:</b> PMU staff supported by consultants</p> <p><b>Time:</b> Year 1–4</p> <p><b>Target 4: Achieved</b></p>	<ul style="list-style-type: none"> <li>A CBRSP had been developed and community engagement started even before road construction began. 351 (55%) of the 639 community members who were trained to be community road safety educators/facilitators are women. The campaign reached around 105,289 people, including an estimated 48% of women participation. IEC materials (i.e. leaflets, poster, banner, T-shirt on road safety) and 100 video clips (on road crash victims/human errors) were distributed and displayed.</li> </ul>	
<p>The project includes an HIV/AIDS awareness and prevention program to mitigate potential HIV-related impacts during and after construction</p>	<ul style="list-style-type: none"> <li>HIV/AIDS awareness program, implemented between 2011 and 2015, has reached the following people:               <ol style="list-style-type: none"> <li>26,446 local residents including 12,945 women (or 49%)</li> <li>2,482 construction workers including 497 women (20%)</li> </ol> </li> </ul>	<p>.</p>

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<p><b>Responsibility:</b> PMU staff supported by consultants and contractors</p> <p><b>Time:</b> Year 1–4</p> <p><b>Action 9: Achieved</b></p>	<ul style="list-style-type: none"> <li>(iii) 1,507 entertainment workers (all female)</li> <li>(iv) 1,654 truck drivers/porter including 145 women (9%)</li> <li>• HIV/AIDS program also provided the following services:               <ul style="list-style-type: none"> <li>(i) 574 construction workers including 180 women (31%) received VCCT</li> <li>(ii) 9,427 adult general population including 5,094 women (54%) received VCCT</li> <li>(iii) 6,775 women received prevention from other to child transmission</li> </ul> </li> <li>• Additionally, the project developed and distributed the following:               <ul style="list-style-type: none"> <li>(i) Condom distributed free in project areas = 156,982 pcs;</li> <li>(ii) Posters on HIV prevention distributed = 23,946 pcs.;</li> <li>(iii) Leaflets on HIV distributed = 536,659 pcs;</li> <li>(iv) Number of billboards on HHTPP developed and installed in designated locations= 44 pcs</li> </ul> </li> </ul>	
<p>The project includes a human trafficking awareness and prevention program</p> <p><b>Responsibility:</b> PMU</p> <p><b>Time:</b> Year 1–4</p> <p><b>Action 10: Achieved</b></p>	<ul style="list-style-type: none"> <li>• Human trafficking awareness and prevention program was jointly implemented with HIV program between 2011 and 2015. There were 26,446 including 12,945 women (49%) attending human trafficking awareness raising program. The project developed IEC materials on human trafficking and distributed 536,659 pcs to project local residents, construction workers truck drivers and entertainment workers.</li> </ul>	
<p>Baseline socioeconomic survey data will be sex-disaggregated</p>	<ul style="list-style-type: none"> <li>• The baseline social-economic survey was completed in August 2012. The survey was conducted with 1,015 respondents including 602 women (59%) from 183 villages in 7</li> </ul>	

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<b>Responsibility:</b> PMU staff supported by consultants  <b>Time:</b> Year 1–2  <b>Action 11: Achieved</b>	provinces. The data analysis was displayed and represented using sex-disaggregated data. <ul style="list-style-type: none"> <li>The end-line social economic survey was conducted in June 2016 with 400 respondents including 220 women (or 55%) in 3 provinces.</li> </ul>	
<b>Output 4: Reduced Vulnerability of Project Roads to Climate Change</b>		
Vulnerability mapping for rural roads to improve planning for climate change adaptation will include local women at planning stages  <b>Responsibility:</b> PMU staff supported by consultants  <b>Time:</b> Year 2–4  <b>Action 12: Achieved</b>	<ul style="list-style-type: none"> <li>Vulnerability mapping for rural roads has been submitted to MRD in June 2014. Women made up around 25% of the total participation in consultations and planning for field activity of the consultants. They were active in providing their inputs particularly on road safety issues and disaster mitigation. Particularly, they raised the issue of flooding affecting their homes and livelihoods, and the need to take care of the needs of the elderly, women, children and persons with disabilities when disaster strikes.</li> </ul>	<ul style="list-style-type: none"> <li>Absolute value of participant is not available</li> </ul>
Emergency management and Early Warning Systems will engage vulnerable groups (women, disabled persons, etc.), during the planning stage and special provisions will be included for such groups in actual operation of the systems  <b>Responsibility:</b> PMU staff supported by consultants  <b>Time:</b> Year 2–4  <b>Action 13: Achieved</b>	<ul style="list-style-type: none"> <li>Emergency management plan has been prepared in Q2 2016. Between 2016–2017, the project organized a number of trainings, awareness training and consultation on EMP, participated by 302 including women and other vulnerable groups. The pilot of EMP was conducted in Cheu Teal commune with total population of 8,299 including 4,138 women (50%). The pilot site selection was based on the poverty and vulnerability level. EMP does not specify clearly the inclusion of vulnerable group, yet they are the most priority. In commune plan for disaster preparedness, risk reduction, it prioritizes the protection of women, elders, children, widow, pregnant and HIV affected persons with the supply of basic need and</li> </ul>	

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	increase attention on clean water, hygiene, shelters and food for vulnerable group during crisis	
<p>Climate change adaptation will include community-based work programs that involve women in planting and caring for road-side trees and other plants</p> <p><b>Responsibility:</b> PMU staff supported by consultants</p> <p><b>Time:</b> Year 2–4</p> <p><b>Action 14: Not achieved</b></p>	<ul style="list-style-type: none"> <li>Tree planting and maintaining trees and plants have been completed in December 2015</li> </ul>	<ul style="list-style-type: none"> <li>No sex-disaggregated data on labor force.</li> <li>Contractors did not record the labor force hired, only the number and kinds of trees planted in the project areas.</li> </ul>

ADB = Asian Development Bank; ADB-CARM = ADB Cambodia Resident Mission; CBRSP = community-based road safety program; DDIS = detailed design and implementation supervision; EMP = environmental management plan; GAP = gender action plan; GDCF = Gender and Development Cooperation Fund; HHTPP = HIV/AIDS and human trafficking prevention program; IEC = information, education and communication; LBAT = labor-based appropriate technology; LGAP = labor and gender action plan; MPWT = Ministry of Public Works and Highways; MRD = Ministry of Rural Development; NDF = Nordic Development Fund; PDRD = provincial department of rural development; PIU = project implementation unit; PMU = project management unit; RRIP = Rural Roads Improvement Project; SEO = social and environment office; VCCT = voluntary counselling confidential and testing.