

Environmental Monitoring Report

Semestral Report
July – December 2017

Cambodia: Flood Damage Emergency Reconstruction Project – Additional Financing

Prepared by Ministry of Economy and Finance for the Royal Government of Cambodia and the Asian Development Bank.

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Ministry of Economy and Finance

Flood Damage Emergency Reconstruction Project (FDERP)-AF

ADB Loan 3125-CAM (SF)-AF and Grant No. 0285-CAM (EF)

SEMI-ANNUAL

ENVIRONMENTAL MONITORING REPORT

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CAPTION

MPWT: CW10b in Mongkul Borei district/BMC. Water Sprinkling/EMP implementing	MRD-CW15b/SR11: in Puok district/SRP. Water Sprinkling/EMP implementing	MOWRAM: Kok Srok in Varin district in Siem Reap province.
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I. PROJECT DESCRIPTION AND RATIONALE

The project was conceived to meet urgent reconstruction priorities created by the 2013 floods. The Government of Cambodia requested ADB for an additional financing loan in parallel with the similar 2011 approved Flood Damage Reconstruction Project (which was closed on 30 September 2015). The Flood Damage Reconstruction Project-AF (Loan No. 3125-CAM (SF) was approved in April 2014, and was effective from May 2014.

The Project has been restored critical public and social infrastructure assets necessary to restore livelihood, access in project provinces that will secure the social infrastructure services against future flooding. The Project has four project outputs:

Output 1: National and provincial roads rehabilitated. This project output include reconstruction of flood-damaged national and provincial roads in five provinces. In Kampong Cham, one bridge along provincial road 270, which was severely weakened by the floods, was replaced and 16.19 km of national road 70 was reconstructed. In Banteay Meanchey, 25.0 km of provincial road 156D and 22.0 km of provincial road 2563 were repaired and upgraded, and two bridges replaced. In Kampong Thom, 8.15 km of provincial road 264E and 7.37 km of provincial road 264D was reconstructed. In Siem Reap, 11.2 km of provincial road 265F and 6.0 km of national road 63 were reconstructed. In Battambang, 19.7 km of provincial road 1570 were reconstructed. Stage 1 works completed under government funding to restore minimum function of national and provincial roads. Stage 2 & 3 was generally completed under the ADB Loan and Grant.

Output 2: Rural roads rehabilitated. There has been extensive damage to many rural roads as a result of the floods such that lifelines, particularly in project areas, were cut off. The highest priority stage 2 works comprise 114.7 km of rural roads included 4 box culverts and 20 pipe culverts, to benefit 125,414 people in the selected provinces, by rehabilitation of damaged surface and structures. Stage 3 works comprise 149.5 km of rural roads included 42.8 km concrete payments roads, 33 box culverts and 128 pipe culverts to benefit 158,993 people, through improvements for reliable and more efficient access between rural communities and markets. Improved traffic flow and efficient communications will lead to reduced fuel consumption. These roads were selected from the five priority provinces of Banteay Meanchey, Battambang, Kampong Cham/Tboung Khmum, Kampong Thom, and Siem Reap. The stage 3 roads involved in upgrading of a subset of the stage 2 roads, and are selected based on priority requirements for improvement and long-term climate resilience. Stage 2 & 3 was completed under the ADB Loan and Grant.

Output 3: Irrigation rehabilitated and improved flood improvement. At least nine flood-damaged irrigation schemes covering about 37,500 hectares were rehabilitated and improved in six provinces—Banteay Meanchey, Battambang, Kampong Thom, Oddar Meanchey, Preah Vihear and Siem Reap. Stage 2 works involved urgent rehabilitation to restore service functionality for implementation during the 2014 dry season. Stage 3 works have been upgraded with infrastructure improvements; to be implemented during the 2015 and 2016 dry seasons. Civil works and development of hydromet capacity will increase future flood resilience and contribute to mitigation strategies to lower risk arising from climate change. Stage 2 & 3 was generally completed under the ADB Loan and Grant.

The pilot development of a hydromet system in six river catchments will form the basis for improved flash flood forecasting capacity in western catchments.

When complete, it will provide real-time data to support the implementation of a strategic flood management plan and mitigate recurrent flood risks emanating from large flows in those catchments that impact water storages and infrastructure. The hydromet equipment will be complementary to the strategic water management plan, being developed under ADB's program.

Output 4: Project management and facilitation. This output has been supported the Ministry of Economy and Finance, as executing agency, in overseeing and managing the Project. Consultants to ensure that fiduciary will support it and safeguards procedures are followed and that implementation schedules are kept on track. Consulting services have been provided to assist the executing agency and implementing agencies with project management support as well as assistance with the coordination and development of a cross-sector flood management strategy for the affected areas.

1.1 Subproject profile and progress of MPWT:

Under MPWT there are ten subprojects, all subprojects have prepared EMP and IEE. The Output 1 of MPWT has been restored the National and Provincial roads in five provinces. The following are briefing description of subprojects status under Stage 2 and 3 of Output 1:

MPWT Stage 2:

Contract No. MPWT-CW9b: Emergency Reconstruction of Prek Chiek Bridge on provincial road (PR) 270 in Kampong Cham Province. The Contract was awarded on 10 July 2014 for \$938,000 to Sea Board Construction Co., Ltd. The works had been fully completed. There was a savings of \$231,404.07 under this subproject. Completion Certificate was issued on 15 June 2015. Defect liability certificate had been issued. There were four voluntary households permitting to build temporary detour for vehicles and passengers traversed on their land during bridge construction and therefore to cope with resettlement issue.

Contract No. MPWT-CW10a: Emergency Reconstruction of 8 km DBST of Provincial Road PR156D in Banteay Meanchey. The Contract was awarded on 10 July 2014 for \$2,126,833.70 to Ung Simsia Construction Co., Ltd. The work was completed included the repair works (3-cracks) and completed defect liability. There were 55 affected households along the road line were voluntary donated their minor affected properties to the subproject and therefore to cope with resettlement issue.

MPWT- CW11&12: Emergency Reconstruction of 8.15 km of PR 264E and 7.375 km of PR 264D in Kampong Thom. The Contract was awarded on 10 July 2014 for \$2,799,980.19 to Sea Board Construction Co., Ltd. It is now 100% completed included the Completion Certificate of Defect Liability Period. There were 27 affected households along the road lines were voluntary donated their minor affected properties to the subproject and therefore to cope with resettlement issue.

MPWT Stage 3:

Contract No. MPWT-CW9a: Contract No. MPWT-CW9a: Emergency Reconstruction of 16.19Km (St 6+636 to St 22+826) DBST Road on NR70 in Kampong Cham Province. The Contract was awarded on 24 June 2015 for \$2,749,789.91 to Banteay Srei Construction Co., Ltd. The Contract has been completed except for additional side drainage works along the Thlok Chrove market. There is a need to improve the side drainage at the market site or the

constructed road will be damaged over time. The contractor was initially reluctant but has agreed to undertake the required additional works, and requested additional two months time extension. The contingency within the contract will be used for the additional works, thus no additional funds will be required, only time extension needed. MPWT was closely monitoring the progress. Contractor was slower during the civil works implementing. There were 66 affected households along the road line were voluntary donated/permitted their minor affected properties [i.e. sifting their concrete/masonry fences to deeper (out of corridor of impact) in their plot of land] to the subproject and therefore to cope with resettlement issue.

Contract No. MPWT-CW10b: Emergency Reconstruction of 6.40 km DBST Road on PR 156D in Banteay Meanchey Province. The Contract was awarded on 24 June 2015 for \$2,497,238.86 to Visvakam Samnang Construction Co., Ltd. This contract has experienced serious delays at the commencement. MPWT had so far issued several warning letters to expedite works. The progress has improved but still slower than the target. The subproject completion date is 31 May 2017, from 1st June 2017 onward is in the period of penalty till 27 June 2017 (completed main civil works). MPWT is closely monitoring the progress. Nevertheless, this subproject is completed and in period of defect liability. There were five affected households along the road line were voluntary donated their minor affected properties to the subproject and therefore to cope with resettlement issue.

Contract No. MPWT-CW10c: Emergency Reconstruction of 10.06 km DBST Road on PR 156D in Banteay Meanchey Province. The Contract was awarded on 24 June 2015 for \$3,045,589.37 to Visvakam Samnang Construction Co., Ltd. This contract did experienced serious delays at the start and time extensions were granted. The completion date is at 30 April 2017, from 1st May 2017 onward is in the period of penalty till 27 June 2017 (finished main civil works). Nevertheless, this subproject is now completed and in period of defect liability. There were 20 affected households along the road line were voluntary donated their minor affected properties to the subproject and therefore to cope with resettlement issue.

CW13: Emergency Reconstruction of 18.75 km of laterite Road on PR 1570 in Battambang Province. The Contract was awarded on 20 January 2015 for \$1,792,390 (revised contract cost of \$1,786,288.29) to Heng Sambath Construction Co., Ltd. It was 100% completed including additional works and completed six months ahead of schedule. The Completion Certificate was issued on 9 December 2015, and Defects Liability Certificate had also been issued. There were 27 affected households along the road line were voluntary donated their minor affected properties to the subproject and therefore to cope with resettlement issue.

Contract No. MPWT-CW14&CW14A: Emergency Reconstruction of 22.0 Km Laterite Road and upgrading DBST on PR 2563. The contract was awarded on 11 December 2015 to Sweet-Camdeg Jv Co., Ltd., for \$2,859,103.23 and work is currently in progress. Earlier in late 2016, some road sections were inundated by flash floods, and further improvements to drainage and raising embankments were needed. In this regard, CA#1 was approved and works are completed. There were some delays in works due to potential UXOs on the road length. Due to UXOs and additional works, a time extension was initially given till 30 June 2017, but still 15% work remains to do and the contractor has request time extension until mid-August 2017. It is now upgrading to DBST with 17 km in length, the contract awarded to Heng Sambath Construction Co., Ltd on 10 Nov 2017 till 4 June 2018. It has been achieved 60% up to 31 Dec 2017. There were 157 affected households along the road line are voluntary donated their minor affected properties (mainly chunks of land/the barren land along the road line) to the subproject and therefore to cope with resettlement issue.

Contract No. MPWT-CW15: Emergency Reconstruction of 6 km Concrete Pavement on National Road (NR) 63 in Siem Reap Province. The Contract was awarded on 30 December 2014 for \$2,334,526.33 to Visvakam Samnang Construction Co., Ltd. This subproject is now fully completed, and included Defects Liability. There were 34 affected households along the road line were voluntary donated their minor affected properties to the subproject and therefore to cope with resettlement issue.

Contract No. MPWT-CW16: Emergency Reconstruction of 11.20 km of Double Bituminous Surface Treatment (DBST) Road on Provincial Road 265F in Siem Reap Province. The contract was awarded on 27 February 2016 for \$2,233,310.02 to Banteay Srei Construction Co., Ltd. This subproject is completed by 30 September 2016; it is in the period of defect liability. The matter of ancient temple segment is maintained as earth road (approximate 150m). There were 102 affected households along the road line were voluntary donated their minor affected properties (chunk of land/barren land along the road line) to the subproject and therefore to cope with resettlement issue.

1.2. Subproject profile and progress of MRD

Under MRD there are twelve subprojects (four subprojects in stage 2 and eight subprojects in stage 3). All subprojects are under category C. The roads constructed are laterite roads and concrete pavements. The locations of the roads are in Battambang, Banteay Mean Chey, Siem Reap, Kampong Thom, Kampong Cham/Tboung Khmum provinces. Most of Output 2/MRD has been **rehabilitated of Rural Roads** on the existing alignments within right-of-way (ROW), and there are no major resettlement issues. The following are the brief description of subprojects under Stage 2 and 3 of Output 2:

Stage 2:

The Stage 2 civil works progress of all four (CW 9, CW 10, CW11 and CW 12) subprojects were well ahead of schedule. Civil works contracts for four subprojects on stage 2 were awarded on 2 July 2014. The four subprojects were completed and defects liability certificates issued. No major issues.

Stage 3:

MRD-CW13a: emergency rehabilitation of 14.0km of 2 rural roads, concrete pavement, 1 bridge and road structures in Kampong Cham province. The Contract was awarded on 7 May 2015 for \$2,340,792.66 to Heng Sambat Co., Ltd, Under the package, the first road line was divided into two road sections: KC12 (10.5km), connecting from Chheu Teal Toch to Peam Chilieng, and KC14(5.6km), from Thmar Pich to Beoung Proul. The second road line under the package was divided into three road sections: KC13 (4.3km), from Tonle Bet to Toul Ksach, KC16 (4.5km), from Preach Chik to Anlong Poug and KC17 (3.5km), from Toul Ksach to Srah Chork. Laterite road construction (4m wide, 15 cm laterite) for KC13, KC14 and KC16 had been completed under stage 2. Hence, the scope of works under this package contract are: reconstruction of 14-km laterite road on KC17 and KC12 and concrete pavement of 5.68 km on the five road sections including 1 bridge, 4 box culverts and 14 pipe culverts. A V.O. was approved in May 2016 for additional concreting of about 1.85 km. Completion civil work still in the period of defect liability. No major issues.

MRD-CW13b: emergency rehabilitation of 21.8km of 4 laterite roads: The Contract was awarded on 8 June 2015 for \$2,507,635.60 to Xinjiang Beixin Group Co., Ltd, Under the

package KC9 (4.9km), KC19 (1.1km), KC26 (4.2km), KC24 (11.6km), concrete pavement and road structures on 8 road sections: KC9 (0.98km), KC19 (0.22km), KC26 (0.84km), KC24 (1.12km), KC1 (0.7km), KC3 (0.86km), KC20 (2.54 km) and KC23 (0.9km) in Kampong Cham. It is completed of civil work and defect liability. Realignment of road line KC24, requested by 52 beneficiaries with their voluntary donation of affected properties and therefore to cope with resettlement issue.

MRD-CW14: emergency rehabilitation of 16.6Km of 2 laterite roads: The Contract was awarded on 7 May 2015 for \$2,150,903.90 to Heng Sambat Co., Ltd, Under the package, KT5 (14.2km) and KT7 (2.4km) and concrete pavement and road structures on KT5 (2.84km), KT7(0.48km) and KT6(2.4km) in Kampong Thom province. The contract package is completed and Completion Certificate issued on 13 June 2016. No major issues.

MRD-CW15a: emergency rehabilitation of concrete pavement 5.1km and road structures on road line SR1 in Siem Reap province. The Contract was awarded on 5 May 2015 for \$1,077,107.17 to Phlon Hong Co., Ltd, Completion of civil work and defect liability. No major issues.

MRD-CW15b: emergency rehabilitation of 24.2km of 2 rural roads: SR2 (9.2km) and SR11 (15km) and concrete pavement and road structures in Siem Reap province. The Contract was awarded on 11 May 2015 for \$2,190,219.58 to Swee-Camdeg JV Co., Ltd, Completion civil work still in the period of defect liability. A segment of MRD-CW15b/SR2, the chief of Prei commune, in Srey Snam district as well as beneficiaries along this segment requested to contractor to excavate the soil along road line to be as canal to irrigate their paddy, the soil/earth is filling road and elevating from the flood during rainy season and therefore to cope with resettlement issue.

MRD-CW16a: emergency rehabilitation of 15.5km of BC2 laterite road and concrete pavement on BC2 (1.85km) and BC1 (1.886km) and road structures in Banteay Mean Chey province. The Contract was awarded on 17 July 2015 for \$1,725,513.94 to Xinjian Beixin Group Co., Ltd, A VO approved to reduce contingencies and day-works in May2016. Completion of civil work and defect liability. No major issues.

MRD-CW16b: Emergency Rehabilitation of 25.5km of 2 rural roads: BC6 (13km), BC9 (12.5km) and concrete pavement and road structures in Banteay Meanchey province. The Contract was awarded on 7 May 2015 for \$1,976,545.43 (revised contract price \$2,322,034.63 to Bory Kamkor Construction Co. Ltd., and to date the work progress is ahead of schedule. During the 2nd quarter 2015, it was found that three existing bridges along road BC09 need emergency repair for slope protection. MRD has requested for additional funds for this purpose, and the contract variation request for additional works has been approved by ADB in March 2016. The contract has been completed and completion certificate has been issued on 21 September 2016. No major issues.

MRD-CW17: Emergency Rehabilitation of 24.30km of 2 laterite roads BB3 (12km), BB4(12.3km) and concrete pavement and road structures in Battambang province. The Contract was awarded on 11 May 2015 for \$2,939,486.18 to Swee-Camdeg JV Co. Ltd., and the work is completed. The road taking over inspection was held on 09-10 November 2016 and Completion Certificate was issued as of date 17 November 2016. No major issues.

1.3. Subproject profile and progress of MOWRAM:

Under MOWRAM there are eleven subprojects (13 contracts for civil works) and have prepared EMP and IEE (includes stage-2 and stage-3/extensions of the same subprojects). The Output 3 of MOWRAM: **Irrigation rehabilitated and improved flood improvement**. The following are the brief description of subprojects status under Stage 2 and stage 3 of Output 3:

The Construction works for Stage 2 subprojects were 100% completed by end July 2015. The defect liability certificates have been issued for all six subprojects.

Stage-3: ten contracts under stage 3 had been completed. Overall physical progress for Stage 3 is estimated at about 99% and is on target.

Physical Progress of Stage 2 Contracts

The works for seven subprojects were divided into six work packages. Construction works are completed for six subprojects: Trapaing Thmor Irrigation System (CW01A), Tumnub Srae Loor (CW02), Chork Reservoir (CW03A), Tumnub O Angkrang (CW04), Tumnub Luok (CW04), and Tumnub Rolous (CW05). To date the total value of construction contracts awarded under Stage 2 civil works is \$ 4,857,815.98.

CW01A: Trapaing Thmor Irrigation System subproject: The Contract for \$1,499,961.10 was awarded on 1 October 2014 to Ung Simsia Construction Co., Ltd. All works were completed during May 2015 within the contracted amount. The defect liability certificate was issued on 18 May 2016. No major issues.

CW02: Tumnub Srae Loor: The Contract for \$474,731.46 was awarded on 26 June 2014 to Ung Simsia Construction Co., Ltd. All works were completed by December 2014 within the contracted amount. The Completion Certificate was issued on 1 December 2014, and the defects liability certificate was issued on 30 November 2015. No Major issue.

CW03A: Chork Reservoir: The Contract for \$244,955.93 was awarded on 25 July 2014 to Seak Chheav Leng Construction Co., Ltd. All works completed by 25 November 2014. The defects liability certificate was issued on 30 November 2015. No major issues.

CW03B: Basac Irrigation System: The Contract for \$1,066,179.88 was awarded on 5 September 2014 to Seak Chheav Leng Construction Co., Ltd. The construction started on 15 September 2014, and contract was completed on 24 July 2015 and the defects liability certificate was issued 24 July 2016. No major issues

CW04: Tumnub Luok and Tumnub O Ang Krang. The Contract for \$1,025,407.09 was awarded on 26 June 2014 to SBPH Engineering Co., Ltd. This Contract package comprised two subprojects both located in Uddor Meanchey province namely; Tumnub Luok and Tumnub O Ang Krang. Construction of Tumnub O Ang Krang, The Tumnub O Angkrang was completed on 01 December 2014, and defects liability certificate issued on 26 May 2016. The Tumnub Luok faced some initial delays due to flooding of the construction site for several months, and it was completed only in December 2014. The defects liability certificate was issued on 30 November 2015 for this subproject. No major issues.

CW05: Tumnub Rolous: The Contract for \$546,580.52 was awarded on 26 June 2014 to Ung Simsia Construction Co., Ltd. Construction started on 26 June 2014. The Completion Certificate

was issued on 10 February 2015. The defect liability certificate was issued on 10 February 2016. No major issues.

Physical Progress of Stage 3:

MOWRAM-CW01B-Trapaing Thmor Irrigation Subproject: It was awarded on 25 May 2015 for \$1,079,649.72 to Ung Simsia Co., Ltd, and is mainly focusing on dam rehabilitation works, and is now completed. The construction work include repair of drainage canals DC1&DC2, main canals MC1, MC2, MC3, MC Prey Mon, excavation for natural flow path/natural spillway at 15 locations on DC1, DC2. All works completed. The Completion Certificate was issued on 25 November 2015. The defects liability certificate has been issued. No major issues

MOWRAM-CW06 Lot 1-Kork Srok: It was awarded on 30 March 2015 for \$908,100.18 to SBPH Engineering Co., Ltd. The construction of new spillway is completed and is operational. All works have been completed. The defects liability certificate has been issued. No major issues.

MOWRAM-CW06 Lot 2-Tumnub 95: It was awarded on 30 March 2015 for \$178,851.41 to SBPH Engineering Co., Ltd. and completed on 17 July 2015, two weeks ahead of schedule. During the Defects Liability Period, there were several defects identified by the Consultants, and upon re-inspection on 17 August 2016, it was confirmed that all defects have been repaired. The defects liability certificate was issued on 19 August 2016. No major issues

MOWRAM-CW07-Chork & Bassac: It was awarded on 24 June 2015 for \$2,318,292.62 to Seak Chheav Leng Co., Ltd., and was mobilized on 8 July 2015. For Chork subproject, main canal MC1 1,740 m and main canal MC2 1,742 m are completed. There was a variation order No 1 approved for construction of two pipe culverts to drain water from the village canal-side roads, turnout structures on MC1 and MC2, and for wet stone masonry protection at an existing head regulator. The Chork subproject is 100% completed For Basac subproject, the construction works were completed by end April 2016 including a variation order No. 2 for the four pipe culverts to provide cross drainage along 3.2 km access road, and four drain inlet structure construction on the embankments of MC1 and MC2 to drain runoffs from the mountain catchment areas and a primary school into the main canals. A further variation order no 3 was approved to provide for a gate double pipe culvert through the access embankment to connect the canal and regulate flow to the outfall bridge. All works completed, and is under defects liability period from 8 May 2016. No major issues

MOWRAM-CW08: Trapaing Thmor Irrigation System: An ICB contract and it was awarded on 19 February 2016 for \$4,327,472.18 to Soeun Soknan Construction Co., Ltd. A variation order for rehabilitation of 5.75 km section of Pou Roam Bon Main Canal was approved on 18 May 2016, and work is completed. MOWRAM did submit for a possible second variation order for some essential works and the civil work is under taken. The borrow pits of the Trapaing Thmor subproject is belonging to Poy Cha commune had been requested by the chief of fish community to maintain as fish species pond (with letter from the chief of fisheries community) and therefore to cope with resettlement matter.

MOWRAM-CW09: Tumnub Luok and O Angkrang Irrigation System: It was awarded to SBPH Engineering Co., Ltd. on 5 November 2015, and with a variation order, the cost is \$1,796,873.49. There were some earlier delays mainly due to delays in approval of Variation Order No. 1 to change the spillway design from labyrinth weirs with bridges to long broad way crested weirs with low level vehicle crossings. The Variation Order was approved by PRC on 24 December 2015, and was approved in March 2016 by ADB. The Contract has been completed and completion certificate has been issued. The contract is now under defect liability period. No major issues.

MOWRAM-CW10: Tumnub Srae Laor Irrigation System: It was awarded on 20 May 2015 for \$246,283.66 to Tan Kim Eng Co., Ltd. The construction of spillway and turnout structures on MC1 & MC2 and canal MC1, MC2 were fully completed. The subproject construction is now fully completed. The Completion Certificate was issued on 19 October 2015, and the defect liability certificate has been issued. No major issues

MOWRAM-CW11: Tumnub Rolous Irrigation Canal: The contract was awarded on 24 August 2015 for \$346,594.27 to Kuy Leang Ky Co., Ltd. A variation order was approved on 24 December 2015 for additional works. The final contract price was \$367,068.39. Earlier there were some contract non-compliance issues including poor construction quality and supervision but it has been remedied and the construction quality is satisfactory. The contract completion was extended due to additional works under variation order, and works were completed on 12 May 2016, and is now under defect liability period. No major issues.

MoWRAM-CW12 extended/enlarged from CW06 Lot 2: Tumnub 95 irrigation system: The contract was awarded on 5 July 2016 for \$359,066.25 to Eastern Construction & Investment Co. Ltd.. The progress was slow initially mainly due to no work has been possible at the spillway. It is now fully completed. No major issues.

MoWRAM-CW13 extended/enlarged from CW06 Lot 1: Tumnub Kork Srok irrigation system: This is the second added package for MoWRAM. This subproject was awarded in November 2016, It is now fully completed. No major issues.

II. CURRENT SITUATION OF ENVIRONMENTAL MANAGEMENT SYSTEM

During the construction of civil works of 3-IAs (MPWT, MRD and MOWRAM) and to ensure good management of environmental issues, the PCMU Safeguards Specialist in cooperation with the Detailed Design, Implementation and Supervision (DDIS) Consultants have undertaken the following tasks:

- ✓ Undertook site inspections in accordance with relevant criteria in the EMPs.
- ✓ Monitored Contractors' implementation of EMPs during construction,
- ✓ Provided advice and guidance for the Contractors on environmental management matters where required,

- ✓ Provided instructions to the Contractors to undertake actions in compliance with environmental requirements,
- ✓ PCMU Safeguards Specialist also undertook separate monitoring regularly,
- ✓ Prepared and submitted detailed quarterly/semi-annual Environmental Monitoring reports to the Employer. The Safeguards Specialist is responsible for environmental, resettlement, safety, and traffic control activities on site throughout the Contract period.
- ✓ The Safeguards Specialist has been strictly informed that one shall not be away from the site of works without written permission from the Engineer. Within fourteen (14) days without the presence of the Safeguards Specialist on site, a replacement of Safeguards Specialist shall be submitted to the Engineer for approval.
- ✓ Furthermore, Resident Engineers (RE) and Inspectors of the Consultant controlled and monitored all daily works on site. In case environmental, safety and traffic issues occurring, the inspectors have to coordinate with the Safeguards Specialist to promptly control and handle the situation.
- ✓ Through weekly meetings, the Environmental Specialist reviewed, guided and reminded the Contractors to well manage environmental issues.

III. GRIEVANCE REDRESS MECHANISM

As required, during site preparation and construction phases, suitable mechanism to address complaints related to the environmental performance of the project were established. To ensure that there will be a mechanism to resolve such complaints, the 3-IAs undertook the following prior to start of site works:

- i) Established a grievance redress mechanism (GRM)
- ii) Made public the existence of the GRM through public awareness campaigns
- iii) Ensured that names and contact numbers of representatives of the IAs and contractors are placed on the notice boards outside the construction site and at local government offices (e.g. provincial, district, and commune levels)

Through a Grievance Redress Committee (GRC), promptly addressed affected people's concerns, complaints, and grievances about the project's environmental performance at no costs to the complainant and without retribution. The GRC, was established before commencement of site works, and have members from the IAs (e.g. MOWRAM), commune councils, local NGO, and women's organization. Grievances were filed in writing or verbally with members of the GRC. The committee was given 15 days to respond with a resolution. If unsatisfied with the decision, the complainant's had access to the Government's judicial or administrative remedies.

Implementing Agencies (3-IAs) made public, the existence of this grievance redresses mechanism through public awareness campaigns. They did set-up a hotline for complaints and the hotline was publicized through the media and numbers placed on the notice boards outside the construction site and at local government offices (e.g. provincial, district, commune/Sangkat, village levels). Locally affected people could express grievances through the commune/Sangkat councils and these would be referred through the usual channels in those committees.

The GRC received, followed-up and prepared monthly reports regarding all complaints, disputes or questions received about the Project and corresponding actions taken to resolve the issues. The GRC could use the punitive clauses of the 1996 Law on Environmental Protection and Natural Resources Management in conjunction with Ministry of Environment (MOE) to prosecute offending parties.

Villagers and APs were encouraged to voice complaints and these are to be duly investigated and reported through the contractor to the IAs and so to Ministry of Economy and Finance.

The construction supervision inspectors carried out environmental monitoring. Responses to complaints were based on the following schedule:

- ✓ Complaints made to contractor or others
- ✓ Responses by contractor or construction supervision consultants' inspectors.
- ✓ Weekly compiling of checklists by inspectors. Copies of checklists given to contractors as official notification of action being required, confirmation of receipt obtained by contractor signing copy, and joint inspection carried out if necessary.
- ✓ Monthly progress reports by inspectors by consolidating weekly reports.
- ✓ Corrective Action Reports (CARs) from contractors, taken.
- ✓ Monthly progress meetings with contractors at which CARs from previous month examined and checked.
- ✓ Quarterly, semi-annual, and annual progress reports to PCMU/ADB, detailing problems and corrective actions taken.
- ✓ Regular checks by the Safeguards Specialist.
- ✓ Checks with complainants that they are satisfied.

Review of progress was checked on a daily basis by the inspectors. Any urgent issues are drawn to the contractors' attention immediately. Failure by the contractors to respond in a timely or adequate manner was raised with them at the monthly progress meetings.

IV. METHOD OF MONITORING

PCMU's Safeguards consultant frequently conducted field visits to each subproject site during construction and conducted regular meetings with stakeholders. Close consultations with IAs Safeguards Specialists and other consultants undertaken. During each field visit particular attention was paid to environmental aspects (IEE&EMP) with contractors, beneficiaries and primary stakeholders. Below are field visits:

No	Date of field visits	Subprojects-IAs
1	12-15 July 2017	Environmental and Social Safeguards monitored to MPWT CW15&16, MRD CW17, CW16a, CW16b CW15a, CW15b: - Provincial roads of MPWT considered to be partially affected of properties along the road lines and MPWTs' safeguards specialist has conducted consultations with likely affected households, conducted resettlement categorization and verification by third party and finally producing reports. Traffic and dusk control by contractors implementing EMP mitigation measure such as watering and traffic management/site signs. Monitored and confirmed the issues of safeguards both resettlement

		and environmental and together with deputy team leader are paying attention to civil work implementation of contractors to complete on time/schedule, checking defect liability periods.
2	31 July and 1 August 2017	Environmental and Social Safeguards monitoring to MOWRAM CW13 Kok Srok subprojects and CW09 Tomnub Luok and Ou Angkrang: - There is no issue of safeguards regarding civil work implementation, subproject profile had prepared for subproject approval. - The social impact of MOWRAM seems to be the borrow pits after excavating the soils to fill in the dams and or embankments, in fact the borrow pits are requested by fishing community to fish culture and maintain fish species in their community (with letter of confirmation). Contractor has strictly implemented the EMP mitigation measures, for instance, installations of site signs and watering to dusk control during civil work implementations.
3	2-3 August 2017	Environmental and Social Safeguards monitoring to MRD/CW15-SR11: - Rural roads usually are constructed on the existing alignments- there is not affected property along the road lines. Dusk and traffic have short periods/minor impacts to villagers and through mitigation measure of EMP by contractors during civil work implementation such as site sign installation and water pouring to dusk control.
4	11-15 Dec 2017	Environmental and Social Safeguards monitoring to MOWRAM CW12 Tomnub 95, CW13 Kok Srok subprojects and CW09 Tomnub Luok and Ou Angkrang: - The social impact of MOWRAM seems to be the borrow pits after excavating the soils to fill in the dams and or embankments. Contractor has strictly implemented the EMP mitigation measures, for instance, installations of site signs and watering to dusk control during civil work implementations. - There is no issue of safeguards regarding civil work implementation, subproject profile had prepared for subproject approval.
5	19-21 Dec 2017	Environmental and Social Safeguards monitored to MPWT CW10a, CW10b, CW10c, CW16, CW14, CW14A: - Provincial roads of MPWT considered to be partially affected of properties along the road lines and MPWTs' safeguards specialist has conducted consultations with likely affected households, conducted resettlement categorization and verification by third party and finally producing reports. Traffic and dusk control by contractors implementing EMP mitigation measure such as watering and traffic management/site signs. Monitored and confirmed the issues of safeguards both resettlement and environmental and together with deputy team leader are paying attention to civil work implementation of contractors to complete on time/schedule, checking defect liability periods.
6	21-22 Dec 2017	Environmental and Social Safeguards monitored to MRD/CW13b KC12, KC14 and KC16: - Rural roads usually are constructed on the existing alignments- there is not affected property along the road lines. Dusk and traffic have short periods/minor impacts to villagers and through mitigation measure of EMP by contractors during civil work implementation such as site sign installation and water pouring to dusk control.

V. ENVIRONMENT MONITORING RESULTS

- **Design Stage**
- ✓ **Loss of trees**

The subprojects of MPWT involved in improvement of reconstruction of box culverts, side drains, bridges, and existing roads alignments, and there could still have indirect potential impacts on natural forests and some impacts on the trees, that they are voluntarily donating to the subprojects by beneficiaries along the roads lines, and the borrow pits to be used as source of sub-base material since contractors of these subprojects could use the borrow pits developed already by others (CW10b, CW10c). It is to ensure that there are acceptable alternative borrow pit areas that would have an overall beneficial advantage in terms of improved livelihood and reduced environmental impact.

The subproject of MRD involved in repairing the existing roads alignment and construction of concrete pavements, box culverts, pipe culverts and bridges, and no impact on trees. There are no natural forest on the location of borrow pits to be used as source of sub-base material since contractor of these subprojects are using the borrow pits were developed already by others. It is also to ensure that there are acceptable alternative borrow pit areas that would have an overall beneficial advantage in terms of improved livelihood and reduced environmental impact.

The subproject of MOWRAM involved in improvement of the existing dam, embankment, main canals and structures (water gates, spillways, Labyrinth, checks structures), there are still some potential impacts on trees and natural forest depending on the location of borrow pits to be used as source of sub-base material. Ensured that there are acceptable alternative borrow pit areas that would have an overall beneficial advantage in terms of improved livelihood and reduced environmental impact.

- ✓ **Damage to existing structures**

The subproject of MPWT is involved in some mobile shops, private and public assets are located along road curbside or corridors of impact (COI). The design maximized benefits and avoided impacts on assets. Resettlement framework for the Project and Cambodian laws, policies, and regulations complied with these safeguards.

The subproject of MRD involved few private and public assets that are located along the roadside/existing alignment and realignment requesting by beneficiaries. There is no impact to roadside assets and shops benefited by the construction according to road design. Resettlement framework for the Project and Cambodian laws, policies, and regulations complied with these safeguards.

The subproject of MOWRAM is involved in some private and public assets are located along embankment of dam, main canals, and structures (water gates, spillways, Labyrinth, checks structures). The design maximized benefits or avoids impacts on assets. Resettlement framework for the Project and Cambodian laws, policies, and regulations to be complied with safeguards.

✓ Risk of Landmines and UXO

The subproject of MPWT involved in reconstructing existing roads, box culverts and bridges without widening. Nevertheless, risks remained since there may be deep-seated landmines that could be exploded by heavy construction equipment, (for instance, the deep-seated UXO on road line CW14 early January 2017 exploded). Consultation meetings with local communities were done to know clearly if there are risks of landmines or UXO. Unsafe areas cleared before project implementation.

The Subprojects of MRD repaired existing roads and construction of box culverts, bridges without widening and changing of existing roads alignment. Nevertheless, risks remained since there may be deep-seated landmines that could be exploded by heavy construction equipment. Consultative meetings with local communities were done to know clearly where there are risks of landmines or UXO. Unsafe areas cleared before project implementation.

The subprojects of MOWRAM reconstructed existing dams, canals, drainages, embankment, and structures (water gates, spillways, checks). Nevertheless, risks remained since there may be deep-seated landmines that could be exploded by heavy construction equipment. Consultative meetings with local communities were done to know clearly where there are risks of landmines or UXO. Unsafe areas cleared before project implementation.

VI. CONSTRUCTION STAGE

✓ Dust Impacts Monitoring

Generation of dust is expected during earthworks and from hauling of construction materials to site. Dust pollution is a nuisance to communities living along the road lines, especially during dry season. The dust could also affect aesthetics. The Contractor formulated and implemented a dust abatement program that includes spraying of water on roads and work areas within villages close to the road. Vehicles transporting materials were covered with tarpaulin or similar material.

The contractors of MPWT-CW10b in Preah Netr Preah district and CW14 in Thmar Pouk district in Banteay Meanchey province have applied the water spraying/sprinkling and traffic safety sign along the road lines.



✓ **Noise Impacts Monitoring**

Similar to dust, operation of construction equipment and transporting materials could cause temporary noise and vibration. Communities close to work areas could be affected. The Contractor ensured that construction activities within 100m of a village or town limited between 12:00 PM to 14:00 PM and at nighttime. Contractors did applied time limits of EMP.

✓ **Generation of Domestic Wastes Monitoring**

Domestic wastes were generated from camps or living quarters. If not properly managed, it will affect public health. Food containers made of plastic, Styrofoam and glass bottles may pile up and serve as breeding grounds for disease-carrying organism like mosquitoes, houseflies and mouse. These may even clog the drainage system and may cause localized flooding. Contractor ensured that (i) sufficient garbage containers are provided in construction camps and at work site, and emptied daily, the waste being disposed of in an approved landfill or site and (ii) every camp and work site cleaned up before moving to new sites. Contractors usually burned the solid waste as in the site camps; there is no system of waste collection.

✓ **Water Contamination Monitoring**

The most severe water quality impact would be from bitumen, diesel fuel or used engine oil. These substances are toxic to living organisms. Contractor ensured that: (i) Diesel and waste oils are handled and stored properly to prevent leakages or spills. (ii) Waste engine oil is collected, stored and disposed at an approved site (according to national standard). (iii) Storage is in drums, raised off the ground, covered to keep rain out and surrounded by a bund to contain any spills and simplify clean up. The Contractor prepared a Spill Management Plan (including measures to be taken and equipment to be used) to ensure adequate cleanup of any spills. Most contractors subcontracted the bituminous work to subcontractors, that they prepared from their own site camp located at town, for instance, MPWT CW 10b, CW10c, and CW9a.

✓ **Water-borne Disease Monitoring**

Borrow pits could store water and serve as breeding grounds for mosquitoes causing some diseases. Contractor ensured that (i) solid wastes are regularly disposed into safe landfill. (ii) Sitting camps distant to community's and removal of stagnant water areas, and (iii) borrow pits utilized for aquaculture or developed as water storage for community use. Most contractors renting house in the project areas, living with inhabitants, so the solid waste and waste water applied as common inhabitants in the community.

✓ **Soil Erosion Monitoring**

Soil erosion usually occurs during site clearing, embankment works and other earth moving works. When heavy rain comes, sediments are carried into ditches, culverts, nearby water bodies and adjacent lands. The contractor is to implement soil erosion control to minimize soil erosion and sedimentation of waterways. The alternative approaches taken: (i) provided adequate cross drainage to avoid over flow or flooding and (ii) re-vegetated erosion-prone areas. The implementing agencies pay attention for this matter such side drains installation for some segments that should be applied and the grass sodding.

✓ **Loss of Trees Monitoring**

The subprojects of MPWT only to improve the road lines and construction of box culverts, and bridges. Impact on trees is insignificant.

The subprojects of MRD will not have impact during repair of the existing roads and construction of Box culverts, pipe culverts, spillway/causeway, and bridges.

The subprojects of MOWRAM only to improve the existing dam/embankment, canals, drainages and construction of structures (spillway, labyrinth, regulator, checks structure, water gates). Thus, impact on trees is insignificant.

The borrow pits were re-vegetated before being handed back to the owner, used as water point or used for aquaculture. Tree clearing were avoided as much as possible and tree planting carried out where appropriate in order to enhance the environment around the subprojects and it can help to protect erosion.

✓ **Loss of agricultural land for borrow pits Monitoring**

Quarrying filling materials from the rice fields will reduce areas used for rice production. It is expected that the volume of rice that can be planted and be harvested will decrease. The contractor is used only licensed borrow operators. No sides borrow permitted, unless agreed with slop embankment or roadside from residents. The contractors were made responsible for rehabilitating any borrow sites opened and operated by them. Contractors bought land to excavate soil to fill on road or requested by local authorities or the monk committee to excavate as pond for pond water or fish culture ponds.

✓ **Traffic Congestion Monitoring**

Traffic congestion normally occurs due to illegal parking of equipment and piling of construction materials on embankment using for roadways. Contractor performed the following: i) oriented their drivers or equipment operators to comply with the required speed limit. (ii) Driving at low speeds, especially in market, school, hospital, and populated areas. (iii) Keeping the roadway or bypass accessible to commuters to avoid traffic jams. (iv) Parking at designated areas.

✓ **Traffic Accidents Monitoring**

Traffic accidents can happen when vehicles, motorists and hand tractors/walking tractor/local tractors/Kor Yun drives at night without lights. Also accidents can be caused by illegal parking, deep excavations, soil piled along roads with no warning/traffic safety signs. Careless, high speed or unprofessional driving also causes accidents.

Contractors: (i) Installed traffic safety/warning signs like “safety first” at the construction area including fences or enclosures (ii) oriented drivers to drive at low speeds, especially in market, school, hospital, populated areas. (iii) Kept the roadway or bypass accessible to commuters to avoid traffic congestions (iv) Parking at designated area.

✓ **Safety and Health Monitoring**

Accidents inevitably happen during construction; hence, the Contractor formulated and implemented a Health and Safety Plan to protect both the public and the workers. A trained first aid personnel and health facility provided on site. Potable water and sanitary facilities provided to workers.

✓ **Transmission of Sexually Transmitted Diseases**

HIV/AIDS is still prevalent in Cambodia thus it may happen due to influx of workers from various provinces. The Contractor incorporated in the Health and Safety Plan the education of workers on sexually transmitted disease.

6.1. SUMMARY OF ENVIRONMENTAL ISSUES BY IMPLEMENTING AGENCIES:

Under MPWT Component 1: During construction, the contractors have been responsible for site management including traffic, campsites and pollution from human waste. Contractors implemented the EMPs strictly; where necessary, contractors also provided shelters for workers usually by renting houses in the subproject sites. The contractors also used the approved borrow sites for soils during construction. The provincial roads usually are busy with traffic, many vehicles traversed; thus created dust and noise pollution. Adequate measures were taken to minimize such impacts on the local population. Table below summarizes the environmental monitoring status:

PROJECT CONTRACT No.	Status of civil work	EMP/IEE implementation/issue
MPWT-CW9b	Completed defect liability	EMP/IEE attached to doc./contractor
MPWT-CW10a	Completed defect liability	EMP/IEE attached to doc./contractor
MPWT-CW11&12	Completed defect liability	EMP/IEE attached to doc./contractor
MPWT-CW9a	Completed civil work	EMP/IEE attached to docs/contractor. Contractor is slower during implementing the civil works. Some segments are muddy and slippery during rainy season.
MPWT-CW10b	Completed civil work	EMP/IEE attached to docs/contractor. Contractor is slower during implementing the civil works. Some segments are muddy and slippery during rainy season
MPWT-CW10c	Completed civil work	EMP/IEE attached to docs/contractor: Contractor is slower during implementing the civil works. Some segments are muddy and slippery during rainy season.
MPWT-CW13	Completed defect liability	EMP/IEE attached to doc./contractor
MPWT-CW14&14A	On going	EMP/IEE attached to doc./contractor. Contractor is slower in implementing the civil works. Some segments are muddy and slippery during rainy season. And the issue of UXOs exploded in early January 2017 (deep-seated UXO).
MPWT-CW15	Completed defect liability	EMP/IEE attached to docs/contractor: No Environmental issue
MPWT-CW16	Completed civil work	EMP/IEE attached to docs/contractor: No Environmental issue. In this road line, there is an ancient temple so in this segment is maintained as earth road (approximate 150m)

Under MRD Component 2: The rural roads normally generated plenty of dust, and the dust pollution is nuisance to rural communities living along the road lines, especially during dry season. The generated dusts also affected aesthetics and the other issue was site management for construction of box culverts and/or pipe culverts; where the contractors have been responsible for site managements include traffic, campsite and pollutions from human waste. Adequate measures were taken to minimize impacts on the local people. Table below summarizes the environmental monitoring status:

PROJECT CONTRACT No.	Status of civil work	EMP/IEE implementation/issue
MRD-CW9	Completed defect liability	EMP/IEE attached to doc./contractor: No Environmental issue
MRD-CW 10	Completed defect liability	EMP/IEE attached to doc./contractor: No Environmental issue
MRD-CW 11	Completed defect liability	EMP/IEE attached to doc./contractor: No Environmental issue
MRD-CW 12	Completed defect liability	EMP/IEE attached to doc./contractor: No Environmental issue
MRD-CW 13a	Completed civil work	EMP/IEE attached to doc./contractor: No Environmental issue
MRD-CW 13b	Completed defect liability	EMP/IEE attached to doc./contractor: No Environmental issue
MRD-CW 14	Completed defect liability	EMP/IEE attached to doc./contractor: No Environmental issue
MRD-CW 15a	Completed defect liability	EMP/IEE attached to doc./contractor: No Environmental issue
MRD-CW 15b	Completed civil work	EMP/IEE attached to doc./contractor: No Environmental issue
MRD-CW 16a	Completed defect liability	EMP/IEE attached to doc./contractor: No Environmental issue
MRD-CW 16b	Completed defect liability	EMP/IEE attached to doc./contractor: No Environmental issue
MRD-CW 17	Completed defect liability	EMP/IEE attached to doc./contractor: No Environmental issue

Under MOWRAM Component 3: All irrigation subprojects implemented under stage 2&3 were in category B for environment, therefore, the project prepared and submitted the IEEs and EMPs reports. The civil works for irrigation subprojects mainly generated some domestic waste from campsite but no major issues as it was managed well. Other issue was the loss of agricultural land for borrows pits, but these were requested by the landowners to have the pond water to irrigate the rice crops, consumptions/use and fish farming. There are no major environmental issues. Table below summarizes the environmental monitoring status:

PROJECT CONTRACT No.	Status of civil work	EMP/IEE implementation/issue
MoWRAM-CW01A/01B	Completed defect liability	EMP/IEE attached to doc./contractor: No Environmental issue
MoWRAM-CW02	Completed defect liability	EMP/IEE attached to doc./contractor:

PROJECT CONTRACT No.	Status of civil work	EMP/IEE implementation/issue
		No Environmental issue
MoWRAM-CW03a/03b	Completed defect liability	EMP/IEE attached to doc./contractor: No Environmental issue
MoWRAM-CW04	Completed defect liability	EMP/IEE attached to doc./contractor: No Environmental issue
MoWRAM-CW05	Completed defect liability	EMP/IEE attached to doc./contractor: No Environmental issue
MoWRAM-CW06 lot1&2	Completed defect liability	EMP/IEE attached to doc./contractor: No Environmental issue
MoWRAM-CW07	Completed civil works	EMP/IEE attached to doc./contractor: No Environmental issue
MoWRAM-CW08	Completed civil works	EMP/IEE attached to doc./contractor: No Environmental issue
MoWRAM-CW09	Completed defect liability	EMP/IEE attached to doc./contractor: No Environmental issue
MoWRAM-CW10	Completed defect liability	EMP/IEE attached to doc./contractor: No Environmental issue
MoWRAM-CW 11	Completed civil works	EMP/IEE attached to doc./contractor: No Environmental issue
MoWRAM-CW12 (Tumnob 95), Extended from CW06 lot 2	Completed civil works	EMP/IEE attached to doc./contractor: No Environmental issue
MoWRAM-CW13 (Tumnob Kok Srok scheme) Extended from CW06 lot 1	Completed civil work	EMP/IEE attached to doc./contractor: No Environmental issue

VII. CONCLUSIONS AND RECOMMENDATIONS

Generally, there are no major issues during this reporting period.

- ✓ The negative environmental impact during construction phase is short term and minor. The significant impacts included dust control from civil works implementation, materials transportation, human waste, and solid waste generation from construction campsite, work safety and health, pollution from fuels and used engine oil. But, those impacts are minimized by strictly implementation of mitigation measure of IEE, and EMP reports and through regular monitoring.
- ✓ The contractors managed the environmental safeguards issues, however it needs to further improvement and regular monitoring and oversight by EA/MEF/PCMU consultants.

- ✓ Environmental Management System has been established for the subprojects of 3-IAs and for each Contract Package. The Consultant and the Contractor have mobilized personnel to be responsible for environmental management. The Contractors and the Consultant supervisors have cooperated in environmental management plan.
- ✓ The Consultants have approved all Environmental and Safety Managements and Traffic Control Plans. This is the framework of environmental management plan used throughout the subprojects.
- ✓ Specific activities to minimize environmental impacts during construction have been done by the Contractors.
- ✓ The monitoring results showed that the impacts of construction activities to the ambient air, noise, vibration and water are negligible.
- ✓ There have been good coordinating and cooperating from all primary stakeholders (3-IAs, EA, contractors, beneficiaries/communities, and local authorities). Further specific method on hazardous material storage including fuel, used/black engine oil was ensured that the contractor arranged storage areas with proper management to prevent spilling used/black engine oil or hazardous material leakage.

VIII. Some photos highlighting about safeguards of civil works implementation of 3-IAs
1. MPWT civil work implementations and safeguards- CW14A



2. MRD civil work implementations and safeguards MRD-CW15a, CW 15b, CW13a, CW17



**3. MOWRAM civil work implementations and safeguards MOWRAM CW06 lot 1&2-
(Tumnob 95 and Kok Srok)**



END