

Environmental Monitoring Report

First Annual Report on Environment
March 2013

Cambodia: Flood Damage Emergency Reconstruction Project

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Ministry of Economy and Finance
Flood Damage Emergency Reconstruction Project (FDERP)
ADB Loan No. 2852-CAM (SF) and Grant No. 0285-CAM (EF)

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Caption for front cover:

Photo taken during field visit at MPWT-CW6a:Provincial Road No.270 in Kampong Cham Province	Photo taken from MOWRAM, Hun Sen Baray during ADB mission in Kampong Thom province	Photo taken during ADB mission, Toul Skea MOWRAM in Prey Veng province
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I. Introduction

The Flood Damage Emergency Reconstruction Project (FDERP) will restore critical public infrastructure assets that were affected by 2011 flood in order to restore livelihood, access in project provinces. The Project focused on (i) roads (national, provincial, and rural), including bridges and culverts; (ii) irrigation facilities; and (iii) strengthen the Government's flood management capacity. The reconstruction of damaged infrastructures concentrates in Prey Veng, Kampong Cham, Kampong Thom, Siem Reap, Banteay Meanchey, and Battambang provinces. The Ministry of Economy and Finance (MEF) is the executing agency (EA) of the project. Ministry of Public Works and Transport (MPWT); Ministry of Rural Development (MRD); and Ministry of Water Resources and Meteorology (MOWRAM) are the implementing agencies (IAs). As a framework for structuring the Project activities, the restoration of flood damaged infrastructure has been divided into three stages as follows:

- (i) Stage 1 - Immediate repairs to reestablish use of the infrastructure on a temporary basis and restore minimum functioning levels. The most urgent work has already been implemented by the RGC using its own resources.
- (ii) Stage 2 - Fast track repairs where it is necessary to substantially repair the damage before the next wet season to secure the existing (undamaged) works and thus avoid more extensive damage in the coming wet season.
- (iii) Stage 3 - Remaining flood damage restoration to complete the remaining damage repairs, preferably within the following two dry season construction periods.

As the scope of emergency reconstruction works is to restore the damaged infrastructures to the pre-flood level conditions, only minor environmental and social impacts were encountered. So far, the reconstruction of 3 bridges and 2-km of ring road under stage 2 subprojects were implemented by MPWT, the emergency repair of 275.2 km of rural road under stage 2 subprojects were implemented by MRD and the emergency repair of 10 irrigation schemes under stage 2 subprojects were implemented by MOWRAM. All implementing subprojects are in category B for Environment. Hence, this monitoring report, which is the annual monitoring report on Environment, will focus on monitoring results of the EMPs during civil works construction.

II. Subprojects Description and Implementation Progress

The project is aimed at restoring livelihoods and access in the project provinces. The project had three main Outputs:

2.1 Output 1: National and Provincial Road Restoration

The project will reconstruct flood damaged national and provincial roads in 4 provinces. In Prey Veng, 2 km of a ring road, which also serves as a flood protection dyke for Prey Veng City, will be strengthened, and 5 bridges along National Road 11 which were severely weakened by the floods will be replaced and improved. In Kampong Cham, Banteay Meanchey and Battambang provinces, 72 km of provincial roads will be repaired and upgraded, and seven structures and five bridges replaced. From the start of the project till the end of 2012, the following stage-2 subprojects are under construction, which scheduled to be completed by March 2013:

- Emergency repair of 2-km detour road in Prey Veng province: the 2-km detour road of Prey Veng city connecting the two sections of the National Road No.11 from one end to another bypassing Prey Veng city serves as dyke to protect the city from inundation in rainy season. Due to 2011 flood, the detour road was severely damaged. Many leaks were observed while flood levels were high, requiring full time surveillance and rapid on the spot repairs to prevent piping failure. Scouring holes also developed at various locations of the dyke embankment which left the dyke in critical condition. If the detour road collapses the whole Prey Veng city would be flooded, affecting more than 33,000 people and thousands of businesses which resulted in huge economic losses. Another major benefit of this detour road is to divert heavy traffic on National Road 11 from the city center, which would significantly reduce the traffic congestion and traffic accident in the city. The emergency stage 2 repair of this dyke is to strengthen the existing embankment with proper slope and scour protection, restore the existing detour road with proper shoulders at both sides of the road. The contract for this subproject was awarded in May 2012. The construction works were extensively progressed during the first three months, but were slowed down for the last three months due to rainy season. The overall progress was estimated to be 60% as of the end of December 2012.
- The Construction of Krong Prey Veng and Baray Lex Bridges: the bridges are located on National Road No.11, which is a principal road that traverses two provinces (Kampong Cham and Prey Veng) in south-eastern Cambodia, and also links the National Road No.7 and National Road No.1 connecting Vietnam Border. The existing project bridge, constructed in 1993, was severely damaged by flood. Scouring and huge settlements of the bridges foundations were observed during flooding. The existing wooden-steel composite bridges are in unstable conditions and prone to collapse during next floods. If the bridges collapse, the National road No.11 would be cut and the Prey Veng provincial city would be isolated. In addition, traffic flow from Kampong Cham to Vietnam border would be diverted to about 200 km, which resulted in increase in travel time, vehicle operating cost leading to huge economic losses. Thus, it is critical to start the reconstruction of these deteriorate bridges to make sure that the National Road No.11 will not be cut during the next rainy season. The bridges will be 2-lane with a total length of 163.7 m. It will have piled foundation, reinforced Concrete (RC) substructure, box beams set on crossheads and on abutments as superstructure. The contracts for these two bridges were awarded in May 2012, with the overall construction progress of 48% as of December 2012.
- Reconstruction of Koh Roka Bridge: the bridge is located about a few kilometers away from Kampong Cham city on Provincial Road No.270, which is one of the main provincial roads connecting the provincial city to Kang Meas District. Kampong Cham, one of the most flood-affected provinces, has strong potential for agriculture (rice, vegetables and fruit plantations), fishery and industry development, but the recent flooding ruined the already-inadequate existing infrastructure for sustainable development. The existing reinforced concrete bridge, constructed in 1954, was critically damaged by the 2011 flood. It was observed that scouring around the bridge abutments during the flood caused the bridge to significantly settle and thereby generating structural cracks on the main structural Outputs of the bridge. Soon after the flood, the Koh Roka bridge was temporarily repaired by filling scouring holes and covering the deck holes by steel sheets. The existing bridge is in unstable condition and heavy traffic was temporarily prohibited for safety reason. Consequently, transportation of agricultural

products as well as other economic activities are on hold in the region of the province. Therefore, it is critical to start the reconstruction of this deteriorate bridge in order to promptly restore the traffic and economic activities to normal condition. The new 2-lane bridge will be constructed on its existing alignment. The bridge, with an overall length of 45 m, will be prestressed concrete bridge. The contract for this subproject was awarded in May 2012 with the construction progress of 74.3% as of December 2012.

2.2 Output 2: Rural roads restoration

The Project will reconstruct about 450 km of flood damaged rural roads in five provinces of Prey Veng, Kampong Cham, Kampong Thom, Siem Reap and Banteay Meanchey. Of the 450km rural roads, 275.2 km rural roads in five provinces awarded in stage 2 are under emergency repair. Most of the restoration works have been completed during the last quarter of 2012, except some repair works in Banteay Meanchey province, which was delayed due to 2012 flood.

- The package CW1 consists of four roads. The first subproject (PV1) covers 15.7 km of rural road from Kampong Popil to Chreang Totoeung in Peareang district. It connects to national road No. 8, and is one of the important rural roads in the north-west of Prey Veng province. The second subproject (PV5) is 5.6 km rural road from Plouv Phum to Po Sabang in Peareang district. The third subproject (PV6) is emergency repair of 20.5 km rural road from Boeung Kak to Lngoeun in Kanh Chriech district. The fourth subproject (PV7) is 7.7 km rural road connecting from national road No.1 to Trapeang Roka in Kampong Trabek district.
- The subproject CW2: (KC1A) covers 27.0 km of rural road from Tary Krom to Prek Tanong in Kah Sotin and Srey Santhor district. It is one of the important rural roads in the west of Kampong Cham province. The second subproject (KC2) is 13.5 km rural road from Phum Tiprampi to Spean Preak Cham in Krouch Chma district. The third subproject (KC3) is emergency repair of 7.0 km rural road from Sokorng to Reay Pay in Kang Meas district. The fourth subproject (KC7) is 14.0 km rural road from Peam Chileang to Thmorpich in Tboung Khum district. The fifth subproject (KC8) is the 12.4 km long from Phaav to Daun Dom in Cheung Prey and Batheay District, and there is a bridge construction excluding road restoration at KC1B in Srey Santhor district.
- The package CW3 consists of five roads lines. The first subproject (SR2) covers 6.0 km of rural road from Prey Toteung to Balaang in Chikreng district. The second subproject (SR3) for the package is 14.6 km rural road from Kralanh to Sambo in Kralanh district. The third subproject (SR5) is emergency repair of 9.8 km rural road from Bakorng to Kandek in Parasat Bakorng district. The fourth subproject (SR6) is 10.6 km of rural road from Khnat to Keo Poir in Puok district, and the fifth subproject (SR8) is 9.0 km rural road from Reusei to Luok in Chikreng district.
- The package CW4 consists of seven road lines. The first subproject (BMC1) covers 20.0 km of rural road from national road No.5 to Chaeng Maen through Ballangk in Malai district. The second subproject (BMC2) for the package is the 7.0 km rural road from national road No.5 to Thmasen in Poipet district. The third subproject (BMC4) is repair of 10.0 km rural road also from national road No.5 to Tasol in Mongkol Borei district. The fourth subproject (BMC5) is the 4.0 km rural road connecting from Kah Porng Svort to Kah Keo in Mongkol Borei district. The fifth subproject (BMC6) is covering 8.0 km of rural road from national road No.5 to Samroung in Ou Chrov district. The sixth subproject (BMC7) is emergency repair of 7.0 km rural road from national road No.5 to Srah Rieng in Mongkol Borei district, and the seventh subproject (BMC8) is covering 9.5 km rural road from national road No.5 to Chamnom in Mongkol Borei district.
- Subproject CW5 involves the repair of 86.1 km in Kampong Cham and Prey Veng provinces, placement of subbase material along the existing roads is a method of construction that reshape damaged road surface and top up with laterite thickness of 10 or 15 cm. Replacement of Structures and Drainage Work. The bridges will be constructed at KC7 road in Kampong Cham Province. There will be two (2) lanes with an overall length of 25 meters for both of them. It will have piled foundation, reinforced concrete (RC) substructure, T-beams as superstructure. Damaged box culverts will be replaced with equivalent or bigger size.

Clogged and damaged pipe culverts will also be replaced with bigger size culverts for the smooth drain.

- Subproject CW6 involves the repair of 52.6 km in Kampong Thom and Siem Reap Provinces, placement of subbase material along the existing roads is a method of construction that reshape damaged road surface and top up with laterite thickness of 10 or 15 cm. Replacement of Structures and Drainage Work. There is no bridge construction in this subproject. Damaged box culverts will be replaced with equivalent or bigger size. Clogged and damaged pipe culverts will also be replaced with bigger size culverts for the smooth drain which helps minimizing the slope erosion.
- Subproject CW7 involves the repair of 30.0 km in Banteay Mean Chey province, placement of subbase material along the existing road is a method of construction that reshape damaged road surface and top up with laterite thickness of 10 or 15 cm. Replacement of Structures and Drainage Work. There is no bridge construction in this subproject. Damaged box culverts will be replaced with equivalent or bigger size. Clogged and damaged pipe culverts will also be replaced with bigger size culverts for the smooth drain which helps minimizing the slope erosion.
- The package CW8 consists of five road lines in Kampong Thom province. The first subproject (KT1) covers 15.0 km of rural road from Anlong Chuor to Tuol Kreul in Prasat Blang district. The second subproject (KT2) for the package is the 4.2 km rural road from Thmey to Kampeut in Prasat Blang district. The third subproject (KT3) is the emergency repair of 5.2 km rural road from Mean Chey to Chek Mouy Stong in Sandan district. The fourth subproject (KT5) is 3.5 km rural road connecting from Tuol Sangkae to Sang in Santuk district. The fifth subproject (KT6) is emergency repair from national road No.6 to Thlok in Stoung district.

2.3 Output 3: Irrigation and Flood Control

Under this Output, about 26 flood damaged irrigation schemes covering about 25,000 ha will be repaired in at least 5 provinces: Prey Veng, Kampong Cham, Kampong Thom, Siem Reap, and Battambang. From the start of the project till the end of 2012, the following stage-2 subprojects are under construction, which scheduled to be completed by March 2013:

- Lam Laong canal system: The irrigation system, located in Prey Veng Province, was first constructed in Pol Pot regime and rehabilitated in 2003 under the World Bank Fund. The irrigation scheme was severely affected by 2011 flood as most parts of reservoir and canal embankments were hugely damaged. The contract was awarded in June 2012 with the construction progress of 42% as of December 2012.
- Toul Skear canal system: The irrigation scheme, located approximately 2km east of Prey Veng town, was constructed during Pol Pot's regime. Most parts of the main canal embankments were severely damaged during the 2011 flooding, which need urgent restoration works. The contract was awarded in June 2012 with the construction progress of 58% as of December 2012.
- Ork Ambok main canal system: The irrigation scheme, located in Prey Veng province, was constructed during Pol Pot's regime. Most parts of the main canal embankments were severely damaged during the 2011 flooding, which need urgent restoration works. The contract was awarded in June 2012 with the construction progress of 80% as of December 2012.
- Boeung Kamplienh dam: the dam, located in Prey Veng province, was constructed during 1970s. Most parts of the existing embankments were severely damaged during the 2011 flooding, which need urgent restoration works. The contract was awarded in June 2012 with the construction progress of 95% as of December 2012.
- Srok Dam: The dam, located in Kampong Cham province, was constructed during Pol Pot's regime. Some parts of the dam embankments were severely damaged during the 2011 flooding, which need urgent restoration works. The contract was awarded in June 2012 and the restoration works were completed in October 2012.
- Boeung Kak canal scheme: The irrigation scheme, located in Kampong Cham province, was constructed during Pol Pot's regime. Some parts of the existing embankments were severely

damaged during the 2011 flooding, which need urgent restoration works. The contract was awarded in June 2012 and the restoration works were completed in October 2012.

- Hun Sen Baray Main Canal System: the main canal system, located in Kampong Thom province, was constructed during 2007 by military engineering team. Some parts of the existing embankments were severely damaged during the 2011 flooding, which need urgent restoration works. The contract was awarded in June 2012 with the construction progress of 60% as of December 2012.
- Kamping Pouy Irrigation Scheme: the Kamping Pouy irrigation scheme, located in Battambang province, was constructed in Pol Pot's regime and rehabilitated during the 1990s. The head regulator would have been washed away during the 2011 flooding if construction of temporary dyke in front of the head regulator could not be completed on time. In additions, most parts of the main canal embankments were severely damaged by 2011 flood. Urgent reconstruction of the head regulator and restoration of the main canal existing embankments are needed. The contract for this subproject was awarded in June 2012 with construction progress of 35% as of December 2012.
- Boeung Kanseng dyke and Kang Piseh canal: The dyke and canal system was constructed during Pol Pot regime in 1977 by mobilized labor forces and is located approximately 3 km to the east of National 5 road and adjacent to the Chrouy Sdaoy village and lies within Chrouy Sdaoy commune in Thmor Koul District in Battambang Province. The contract was awarded in June 2012 with the overall construction progress of 71% as of December 2012.

III. Environmental Categorization

3.1 ADB's classification system

Prior to civil works implementation, all the subprojects described in the above section have been screened and classified using ADB's classification system as follows:

- Category A. A proposed subproject is classified as category A if it is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works.
- Category B. A proposed subproject is classified as category B if its potential adverse environmental impacts are less adverse than those of category A projects. These impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for category A projects.
- Category C. A proposed subproject is classified as category C if it is likely to have minimal or no adverse environmental impacts.

3.2 Subprojects Category

Under Output 1, all of the subprojects implemented under stage 2 are in category B for Environment, which can be briefed as follows:

- Emergency repair of 2-km detour road in Prey Veng Province: The road is being reconstructed on the existing alignment in order to minimize the impact. As the road also served as a dyke, it is required to raise the embankment which resulted in widening the bottom width of the road. During the field visits, it is concerned that the borrow pits has to be converted for uses as fish cultures or pond for irrigation the vegetable in the residential areas.
- Emergency reconstruction of Krong Prey Veng bridge: The existing bridge was temporarily maintained during construction in order to keep normal traffic flow. Parallel to this bridge within the right of way, the new bridge will be constructed.
- Emergency reconstruction of Baray Lex bridge: The bridge is being reconstructed on existing alignment.
- Emergency reconstruction of Koh Roka Bridge: The bridge is being reconstructed on existing alignment. There is no loss of trees for the three bridges and there is no borrow pits. The issue is a management of **traffic congestion**, the traffic congestion normally occurs during the peak traffic of vehicles, passing the bypass/detouring roads, the management consultants should install the following signs: i) orient the drivers to comply with the

required speed limit. (ii) allows one side to pass through and then other side pass, (iii) having signs to warn such as detouring/bypass roads on the right/left hand sides, slow down and the site in front 200 meters, (iv) install traffic/warning signs like “safety first” at the construction of bridge.



Under Output 2, all of the 275.2km rural roads implemented under stage 2 are in category B for environment. The restoration works for those flood-damage laterite roads did not involve any road widening, embankment raising or changing the existing alignments. The scope of works was to reconstruct the road subbase and top up with either 10cm or 15 cm with laterite layer. The rural roads normally are generated of dust the dust pollution is nuisance to communities, who live adjacent to the roads, especially during dry season. The dusts also affect aesthetics. And other issue is site management for construction of box culverts and/or culverts, the contractor has to be responsible for site management include traffic, site camp and pollutions from human.



Under Output 3, all of the 10 irrigation subprojects implemented under stage 2 are in category B for environment issue, therefore, it is designing the IEEs and EMPs reports to monitor. The scope of works was to reconstruct the flood-damage embankments or replaced existing damage structures and to restore to the pre-flood conditions. The civil work for irrigation subprojects mainly impact by generation of domestic wastes which is from camps or living quarters. If not properly managed. Other issue is the loss of agricultural land for borrow pits.

3.3 Grievance Redress Mechanisms

Provincial Sub-committees for Resettlement have been established in the project provinces in order to solve any resettlement-related issues including complaints from local people. The following mechanisms, which are in line with the project framework, were adopted and implemented for complaint handling. These are also being adopted for environmental grievance redress.

- First stage: Complaints and grievances will be provided verbally or in writing to the village chief, commune chief, IRC working group or PIU staff. The receiving agent will provide immediate written confirmation of receiving the complaint. If after 15 days the complainant does not hear from the village and commune chiefs, IRC working group or PIU staff, or if he/she is not satisfied with the decision taken in the first stage, the complaint may be brought to the District Office.

- Second stage: The District Office has 15 days within which to resolve the complaint to the satisfaction of all concerned. If the complaint cannot be solved at this stage, the District Office will bring the case to the Provincial Resettlement Committee (PRC).
- Third stage: The PRC meets with the aggrieved party and tries to resolve the situation. Within 30 days of the submission of the grievance, the Committee will make a written decision and submit copies to the executing agency (including IRC) and implementing agencies.
- Fourth stage: If the aggrieved affected household does not hear from the PGRC or is not satisfied, he/she can bring the case to Provincial Court. The Court will make a written decision and submit copies to the executing agency and implementing agencies. If any party is still unsatisfied with the Provincial Court judgment, he/she can bring the case to a higher-level court.

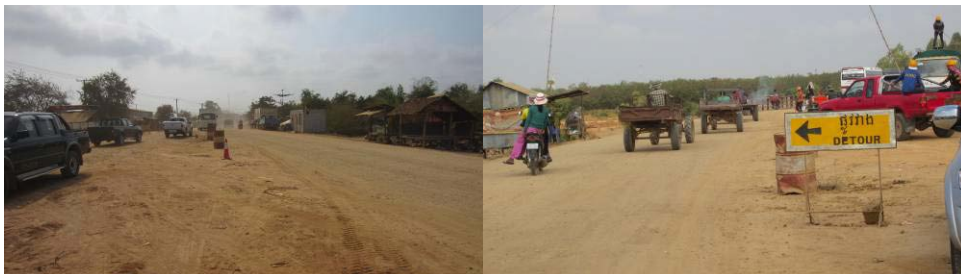
IV. Method of Monitoring

PCMU consultant frequently conducted field visits to each subproject site. During each field visits particular attention have been paid to the environmental issue i.e. the statement issues of the Environmental Management Plan have been verified with the implementation of civil works of contractors.

V. Monitoring Results

Under Output 1, all environmental management plan had been monitor during constructions. The results of the monitoring are summarized as follows:

- Emergency repair of 2-km detour road in Prey Veng Province: It was observed that there is no potential impact on environmental issue. The EMPs had been followed under construction. It was also confirmed by local authorities that no complaint has been received regarding construction works.



Photos: detour road and the road surface:

- Emergency reconstruction of Baray Lech bridge: It was observed that there is no environmental impact for bridges construction. It was also confirmed by local village chief that there has never been any complaint from the local people so far regarding the bridge construction.



Photos: good workers with helmet



Photo: shows about traffic flow

- Emergency reconstruction of Koh Roka bridge: It was observed there have been good signs/ warning installation for this bridge construction, please see picture below during the field visit.



Photo: installation of sign/warning



Photo: to warning about the site work.

VI. Conclusions and Recommendations

During construction under Output 1 a series of temporary negative impacts including dust, noisy, road safety, worker's safety, wastewater, solid waste and water contamination have been occurred, However, those impacts are avoidable and reduced by environmental control measures and mitigation measures and there is a need to regular check by the safeguards specialists.

In order to reduce the impacts, the alternative approaches are recommended as below: The environmental mitigation measures and environmental monitoring plan which present in the IEE and EMP reports should be implemented. Good cooperation between all stakeholders, especially IA, EA and local authorities should be undertaken.

Further investigations are needed with regard to developing a suitable design for the excavation and borrow pit, mainly MOWRAM and MRD subprojects so that these may provide a range of multiple uses for the farmers whose land they will be excavated on.