

# Environmental Management Plan

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## CAM: Provincial Roads Improvement Project

Additional Scope of Work of Srok Dike,  
Svay Rumpear Commune, Kampong Leaeng District, Kampong Chhnang

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**Environmental Assessment and Updated Environmental Management Plan**

**Additional Scope of Work of Srok Dike,**

Svay Rumpear Commune, Kampong Leaeng District, Kampong Chhnang

## **1. Introduction**

1. The ADB review mission carried out from 21-26 February 2019 to (i) undertake assessment of project implementation progress; (ii) follow up on the remaining procurement packages and the implementation of the agreed time-bound actions during the last review mission; (iii) identify key challenges and explore necessary measures to expedite the civil works implementation completion and to ensure that all subprojects/activities are completed before the current project closing date; (iv) confirm the loan/grant covenants compliance; and (v) update the Project Administration Manual following the recently approved minor changes in implementation arrangements.
2. The ADB review mission visited Srok Dike which was recently completed but eroded during the annual flooding season. The Contractor will rectify the defects under liability period. In the meantime, MPWT proposes special slope protection measures for Srok dike to be considered and implemented following the actual site condition before next flooding period for the sustainability of this dike. The mission also observed during the site visit that farmers receive benefits from the Srok reservoir as they can use water for irrigating their rice fields and the reservoir could irrigate more than 800 ha, according to consultation meeting with beneficiary farmers and villagers in the project area.
3. Hence the Ministry of Public Works and Transport (MPWT) is considering utilizing remaining fund saving from the Loan 8254 to propose for the Srok dike slope protection. Two technical options are being considered: (i) geotextile with rock-fill or (ii) grouted riprap, with the estimated costs of \$352,450.00 and \$569,447.40, respectively. This additional work is estimated to be completed within four months.
4. Based on the said proposed technical options, two staff members from the MPWT's Environment and Social Office (ESO) and Project Management Unit (PMU) together with the ADB safeguards consultant carried out environmental and social impacts screening and public consultation meeting with beneficiary farmers on 7 March 2019 to assess the environmental and social effects of the proposed additional scope of works, as part of due diligence for additional works on Srok dike.

Figure 1: Srok Dike Location



	
Previous construction signboard	Current dike condition
	
Eroded slope to be repaired	Reservoir, Fish and flooded forest conservation
	
Panel of the fish and flooded forest conservation of Community fishery, Svay Rumpear Sen Chey	Current slope of power tiller access

## 2. Objective of Environmental Assessment

5. Srok dike was damaged during the flooding after its recently completion in 2018. The slope was eroded, and the dike crest was shrunk (less than 5 meters from its actual width). The total length of the dike is 2,575 meters with 5 meters of dike crest and four (04) water gates were constructed. Lesson learned from this erosion, two technical options are being considered: (i) geotextile with rock-fill or (ii) grouted riprap.
6. As this is the additional work scope, some concerns need to take into account for either of the proposed technical options e.g. site safety (especially kids in the village, passengers), dust, noise, construction waste management and disposal, fish population and conservation, etc. Although the impact is minor, site specific, and reversible in nature but protection and mitigation measures have to be designed.
7. Therefore, the objective of the environmental assessment for the proposed additional work scope of the Srok dike are to: (i) assess the potential environmental adverse impacts/issues related to the construction activities of the propose additional work scope; (ii) update an Environmental Management Plan for the subproject which will be included in the general conditions of the contract of the bidding documents; and (iii) disclosure of the updated EMP (UEMP) on the ADB and MPWT website.

## 3. Overview of Environmental Assessment from the Field Visit

8. Considering the nature of the proposed above-mentioned technical options and after the site screening, a formal environmental assessment report or IEE was not considered necessary because the impacts are deemed to be site specific, minor and reversible. The field screening<sup>1</sup> was carried out on 7 March 2019 based on technical options of the proposed additional work scope. And the environmental management plan needs to be prepared/updated based on the earlier IEE of the project as it was classified as environment category B.
9. The main purpose of additional work whether riprap or rock-fill with geotextile is to prevent the dike slope from erosion or damage from flooding. The total length of the Srok dike is 2,575m long with 5 meters of dike crest. This additional work will commence only after existing slope defects are repaired under liability period of the previous contractor.
10. The potential risks or concerns from the additional work activities which could directly or indirectly affect the environment, health and safety of the communities are identified as followings:
  - I. **Pre-construction.** Environmental impact screening was carried out at site. The activities of proposed additional work scope, apparently, will not involve any land acquisition nor destruction on cultural heritage or in the area with the presence of UXOs as it will only build on the existing slope of the newly built dike. According to consultation carried out on 7 March 2019<sup>2</sup>, there is publicly available land for temporary camp site for workers during the implementation of the project. And some requests, which are agreed by MPWT, from farmers during consultation meeting i.e. one-meter wide canal at the toe of slope, outside of the reservoir, and correction of the steep ramp for power tiller going up and down to rice fields will be included in the contract package of the additional work scope (according to MPWT). Impacts anticipated from these activities will also be included in the updated environmental management plan<sup>3</sup> (UEMP).

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<sup>1</sup> Rapid environmental assessment checklist.

<sup>2</sup> Consultation meeting is attached in appendix 2.

<sup>3</sup> Detail UEMP is in appendix 4.

- II. **During construction.** The negative impacts anticipated during construction include those resulting from: (i) extraction of construction materials and transport of construction materials; (ii) disposal of construction wastes; and (iii) other temporary impacts such as air quality, dust, noise, solid waste management or improper of hazardous waste disposal, etc.

- i. **Extraction of construction materials.** According to the Cambodia Law a license is required for the extraction of any natural resources such as stone and gravel. Also, crushing operators should have an environmental permit covering the operation of their equipment. All contractors under the subproject will be required to use only fully licensed and permitted operators as sources for raw materials.
- ii. **Construction related waste materials.** The contractor would be required to conform to environmental regulations and practice relating to proper disposal. Waste can be solid, liquid, or gaseous and each type has different methods of disposal and management.
- iii. **Temporary short-term impact<sup>4</sup>** from noise, dust, vibration, water pollution and contamination, land use pattern, solid waste management and traffic accident during the construction is inevitable but mitigatable and manageable. Noise levels will increase due to movement of construction machinery and vehicles. This impact will be minimized under the subproject by:
  - a) specifying in all subproject contracts the responsibility of contractor to undertake appropriate work site mitigation actions as a part of their management of work sites; and
  - b) the supervision of compliance of contractors by the construction supervision consultant/field engineer.

Mitigation measures may include the following actions: use of sprinklers to wash down roads and suppress dust emissions during soil transport; cover vehicles to prevent spills and transport borrow materials during daytime only; reduce noise by using noise absorbing/protecting building materials, provide workers with ear plugs and helmets and generally prevented from prolonged exposure to high noise levels, etc.

However, the magnitude of the impacts will not be substantial and can be mitigated with implementation of proper management; the structural works would be of small scale, and the location of the dike is not close to the residential/village area.

- III. **Operation Stage.** Once additional work scope is completed, the reservoir would be operated under Kampong Leaeng district and the Fish Conservation and Flooded Forest Preservation community. Potential negative environmental impacts during the operational period include: (a) floods; (b) slope erosion due to flood; and (c) loss of protected flooded forest/conservation fish species from the reservoir.

11. This UEMP sets out some provisions similar to the Environmental Codes of Practice to be attached to the civil works contract agreement (Appendix 3<sup>5</sup>) in order to mitigate above-mentioned potential negative environmental impacts during construction period.

12. Mitigation measures to the above environmental problems/concerns have to be addressed and minimized or prevented from happening. The UEMP offers preventive and mitigation

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<sup>4</sup> Mitigation measures to all impacts are detailed in the UEMP.

<sup>5</sup> Provisions to be included in the bidding documents for the civil work contract package.

measures incorporated into standard practices and the contracts for civil works. Contractor specifications to address environmental issues relevant for the project, including construction dust and noise control, waste management, site management, safety controls, provision of clean water and sanitation facilities have been adequately addressed and described in the UEMP Matrix. Appropriate supervision provisions throughout the construction cycle will be built into the contract documents to include engineers and consultants as well as the involvement of stakeholders at community level.

## **4. Updated Environmental Management Plan (UEMP)**

### **4.1 Measures to Mitigate the Environmental Impacts**

13. This section sets out the key principles of the Updated Environmental Management Plan (UEMP) and includes measures to address all potential impacts discussed above, which will be implemented during subproject implementation by the contractor. More specifically, construction works contract will include in the Technical Specifications contractual clauses (Appendix 3) on environmental protection, and the Mitigation Plan (Appendix 4) as well as the Monitoring Plan (Appendix 5) will be attached to these Technical Specifications.
14. During the construction period, the DDIS/PMU3/SEO of MPWT will monitor the implementation of the UEMP, particularly measures related to the construction activities. The DDIS/PMU3/ESO will ensure that all relevant issues (one-meter wide canal and access road/ramp for power tiller) are adequately addressed at the design revision stage, and MPWT/PMU3 will ensure that the contract document includes the relevant clauses. The Contractor that will perform the civil works will also follow the requirements of the current related regulations. The DDIS that will assist the PMU3 in overall subproject management will also assist PMU3 in the supervision of environmental and social aspects. Compliance with the RGC regulations and the terms of the UEMP will be monitored and verified in the monthly reports submitted to the PMU3 by the consultant/field engineer, based on consultations with contractors and site visits. Also, the consultant/field engineer will also look into any new critical issues that may come up during the civil works and suggest actions for various agencies.
15. Appendix 4 sets out the particular mitigation measures during the construction period. Such measures include aspects to: (a) mitigate risks of erosion; (b) restrict water and soil contamination on work sites and around work camps (including littering and waste disposal); (c) restrict generation of dust during construction; (d) reduce risk of fire, cutting of trees for firewood, and trapping by construction workers; and, (e) minimize risk of accidents and ensure occupational safety of workers at construction sites.
16. Implementation of standard impact prevention or mitigation measures through adopting normal engineering practices will ensure that: (a) health risk due to use of chemicals is eliminated; (b) waste is properly collected and treated to avoid environment pollution and health impact ; (c) conservative fish populations is maintained; and (d) labor accident risk is controlled. Detailed mitigation measures for above-mentioned issues are described in detail in Appendix 4.

### **4.2 Environmental Monitoring and Supervision**

17. A monitoring tool has been designed to cover all aspects of construction components, including borrow pits and site management to mitigate erosion, as well as control of pollution and wastes at work sites and camps. There will be day-to-day supervision of earthmoving, transportation of rocks and construction works to ensure there is sound environmental practice employed during the contract period.
18. All such environmental and social measures will be monitored and enforced, together with health and safety measures (including accident prevention) applied by the contractor. It is a

part of the UEMP that the consultant/field engineer conduct a subproject audit of the UEMP to: a) ensure it is up to date and relevant to the situation on the ground; b) to ensure that non-compliance and corrective actions are appropriately documented; c) to review emergency procedures and implementation status; and d) to evaluate corrective responses of the contractor.

19. Environmental monitoring and supervision will be integrated into the project management and reporting system. There are no significant environmental risks or subproject negative social impacts which will not be accounted for through implementation of the UEMP. Appendix 5 summarizes the proposed monitoring activities under the subproject and specifies the parameters to be monitored, location of the monitoring sites, frequency and duration of monitoring. Overall, two types of monitoring reporting are suggested: (i) monitoring on work progress, and (ii) environmental compliance monitoring.
20. The monitoring report prepared by the ESO/PMU3 shall submit to ADB for review, concurrence and disclosure on ADB website.

### 4.3 UEMP Implementation Arrangement

21. The MPWT/PMU3 is the implementing agency for the subproject. Environment and Social Office (ESO) of MPWT will help PMU3 to manage and make sure the work activities at site are in compliance with UEMP requirements with assistance from DDIS.
22. The Contractor will be responsible for compliance with environmental covenants as indicated in the contract. In the case of chance finds the contractor must immediately stop work (until resolution has been obtained) and notify the project manager who would immediately notify the MPWT/PMU3. The MPWT/PMU3 would further notify the appropriate Government or local authority within 24 hours. The appropriate Government body notified would undertake necessary actions to record the findings and determine mitigation requirements within seven working days.

**Responsibility for subproject UEMP implementation**

Community/agencies	Responsibilities
PMU3	<ul style="list-style-type: none"> <li>Responsible for the implementation of the civil works</li> <li>Management of the project in compliance with agreements, laws and regulations of the RGC as well as the ADB SPS.</li> </ul>
ESO	<ul style="list-style-type: none"> <li>Responsible the overall monitoring and reporting on the subproject UEMP implementation</li> <li>May work with the project environmental consultant of DDIS to monitor and supervise of the subproject UEMP implementation</li> <li>Responsible for preparing the monitoring reports to submit to PMU3</li> </ul>
DDIS and/or Field engineer	<ul style="list-style-type: none"> <li>The DDIS/field engineer on the site will assist PMU3/ESO for monitoring the environmental aspects of the subproject during implementation. The DDIS/field engineer will explain to the contractor the responsibilities in meeting the mitigation plans included in the contract. The DDIS/field engineer will play a major role in monitoring.</li> </ul>
Contractor	<ul style="list-style-type: none"> <li>Prepare CEMP and get approval from PMU3</li> <li>Take actions to mitigate all potential negative impacts in line with the subproject UEMP</li> <li>Actively communicate with local residents and take actions to prevent disturbance during construction</li> <li>Ensure that all staff and workers understand the procedure and their tasks in the environmental management plan</li> <li>Report to the PMU3 and/or DDIS on any difficulties and their solutions</li> <li>Report to local authority the subproject manager if environmental accidents occur and coordinate with agencies and key stakeholders to resolve these issues</li> </ul>



Community/agencies	Responsibilities
Local authority and community	<ul style="list-style-type: none"> <li>• Participate in the process of subproject preparation and ensure that their views are taken into account</li> <li>• Monitor contractor's activities in terms of safeguards policies compliance</li> <li>• Report problems to DDIS/field engineer or PMU3</li> </ul>

#### 4.4 Capacity Development and Training

23. Training of the UEMP will be provided for PMU3 counterpart and ESO staff responsible for UEMP implementation, contractor, field engineer and local authority during subproject implementation. This is to ensure that: (a) the proposed subproject activities will be adequately screened; (b) mitigation measures are included in the bidding documents and contracts and supervision and monitoring of the contractor performance is conducted by ESO and/or by the environmental consultant; and (c) close consultation with local agencies and communities is carried out throughout subproject planning and implementation. The cost estimate of this training is estimated about US\$1,500.00 and included in the cost of project safeguards training.

#### 5. Information Disclosure, Consultation, and Participation

24. The impacts due to construction of the Srok dike were discussed with the local authorities, the local community and independent organizations operating in the subproject area of influence. The approach used includes discussions and observations during subproject site visits.
25. On 7 March 2019 a consultation meeting<sup>6</sup> was held in Cheung Kruos village, Svay Rumpear commune of Kampong Leaeng district with the participation of two staffs from MPWT including one staff from ESO, ADB CARM safeguards consultant, local authorities from district office, commune office and farmers. Two separate meetings were conducted: (a) consultation with local authorities including village and commune chiefs and district officers; (b) consultation with farmers. In total, the mission consulted 51 persons of which 9 were women.
26. All 60 participants who live in the project area and the village nearby were very happy to see the renovation/repair of the dike since it was damaged after recent flooding. The mission also provides information about grievance redress mechanism (GRM) and informed participants that the GRM will also display at the district and commune center. The contractor signboard will also provide information and hotline if there is complain from villager. In addition, PIBs will also distributed to all stakeholders before the commencement of construction work and keep in the commune and district centers. During the consultation, participants asked the mission to consider some requests to be included in the new project work scope as followings:
- I. Correction of the steep slope of ramp for power tiller;
  - II. Excavation of one-meter wide canal at the dike's slope toe for further distribution of water to remote rice field;
  - III. Construction of two safety shelters, for multipurpose use during harvesting season, at the corner of the dike so that fishing boat can escape from strong win during flooding season. And by building these shelters the ship/boat's captain would also avoid the Srok dike and no concern about the damage that will cause by the transportation boat/ship.
27. After discussion with MPWT, the request number (I) and (II) are accepted and MPWT includes them into design revision and new work scope. However, request number (III) is not yet

<sup>6</sup> Summarize of the consultation meeting are presented in the appendix 2.

consider putting in the proposed new work scope. And this UEMP will include possible impacts from the two requests in this study as well.

28. In line with the SPS, the mission provided a summary of the proposed subproject's objectives, description, and potential impacts and mitigation measures during consultation meeting to ensure that they have sufficient time to contribute their views or concerns. The final UEMP will be disclosed to the public through the MPWT and ADB website. Hard copies of the final UEMP will be made available in the district and commune offices accessible to the key stakeholders.

## 6. Grievance Redress Mechanism (GRM)

29. As this is the UEMP, the project GRM will follow existing approved IEE of the project. The existing GRM steps are as following:

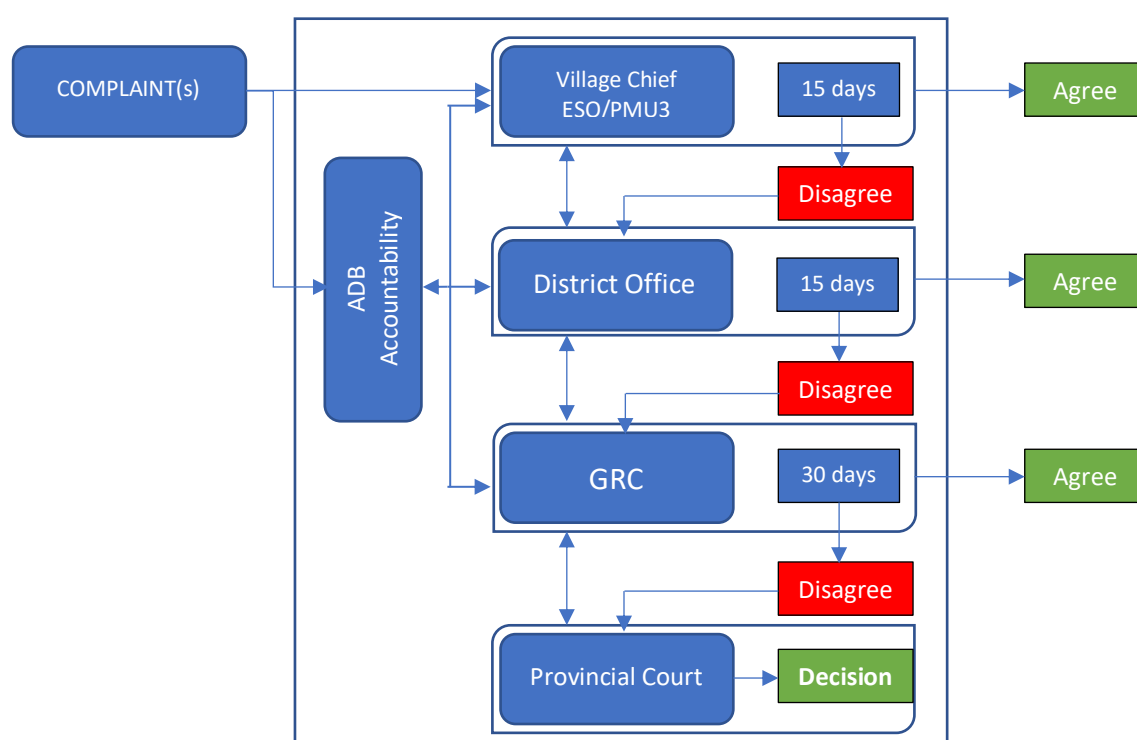
**First Stage:** The complaints and grievances can be presented verbally or in writing to the village chief, commune chief or ESO/PMU3 that was already established for PRIP. The receiving agent will be obliged to provide immediate written confirmation of receiving the complaint. If after 15 days the aggrieved AH does not hear from the village and commune chiefs or ESO/PMU3, 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 Grievance Redress Committee.

**Third Stage:** The Provincial Grievance Redress Committee meets with the aggrieved party and tries to resolve the situation. Within 30 days of the submission of the grievance, the Committee must make a written decision and submit copies to the ESO/PMU3, and the AH.

**Final Stage:** If the aggrieved AH does not hear from the Provincial Grievance Redress Committee or is not satisfied, he/she can bring the case to Provincial Court. This is the final stage for adjudicating complaints.

Figure 2: Diagram of Grievance Redress Mechanism



## **7. Conclusion and Recommendations**

30. Two requests from the consultation meeting, one-meter wide canal on the dike's toe and modify the slope of power tiller access to and from rice field, were approved by the MPWT/PMU3 and detail design revision are being finalized by the DDIS to include in work scope. The impacts from these activities were anticipated in the subproject assessment and provide mitigation measures in the UEMP presented in appendix 4.
31. From overall field assessment of the Srok dike, the subproject will cause minimal or no adverse environmental impacts although the location of the subproject is within the community development area and reservoir of the Srok dike is used for fish conservation. The project will have minor impact to the fish species if UEMP are strictly implemented during construction. One licensed quarry site is operating in the project area and the contractor is obliged to use rock and gravel from the site. Therefore, the Contractor shall prepare CEMP for the additional work scope and get approval from MPWT/PMU3.
32. It is recommended that MPWT/PMU3 shall cause the Contractor to strictly follow UEMP of the project and DDIS/ESO/consultant strictly monitor during construction stage.
33. PMU3/ESO with the support from DDIS shall prepare monitoring report to be submitted to ADB for review, concurrence and disclosure to ADB website.

## Appendix 1: Rapid Environmental Assessment Checklist

Country/Project Title:

**Provincial Roads Improvement Project**

Sector Division:

**Additional Work Scope of Srok Dike, Kampong Leaeng, Kampong Chhnang**

Screening Questions	Yes	No	Remarks
<b>A. Project Siting</b> Is the Project area adjacent to or within any of the following environmentally sensitive areas?		x	The Srok reservoir serves as community fish and flooded forest conservation site.
▪ Protected Area		x	
▪ Wetland		x	
▪ Mangrove		x	
▪ Estuarine		x	
▪ Buffer zone of protected area		x	
▪ Special area for protecting biodiversity	x		Community conservation and breeding reservoir.
<b>B. Potential Environmental Impacts</b> Will the Project cause...			
▪ loss of precious ecological values (e.g. result of encroachment into forests/swamplands or historical/cultural buildings/areas, disruption of hydrology of natural waterways, regional flooding, and drainage hazards)?		x	
▪ conflicts in water supply rights and related social conflicts?		x	
▪ impediments to movements of people and animals?		x	
▪ potential ecological problems due to increased soil erosion and siltation, leading to decreased stream capacity?		x	
▪ impairment of downstream water quality and therefore, impairment of downstream beneficial uses of water?		x	
▪ dislocation or involuntary resettlement of people?		x	
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		x	
▪ potential social conflicts arising from land tenure and land use issues?		x	
▪ soil erosion before compaction and lining of canals?	x		Srok reservoir was shallow before the rehabilitation.
▪ noise from construction equipment?	x		
▪ dust during construction?	x		
▪ waterlogging and soil salinization due to inadequate drainage and farm management?		x	

Screening Questions	Yes	No	Remarks
▪ leaching of soil nutrients and changes in soil characteristics due to excessive application of irrigation water?		x	
▪ reduction of downstream water supply during peak seasons?		x	
▪ soil pollution, polluted farm runoff and groundwater, and public health risks due to excessive application of fertilizers and pesticides?		x	
▪ soil erosion (furrow, surface)?	x		Slope/ramp surface was eroded after flood recede.
▪ scouring of canals?		x	
▪ clogging of canals by sediments?		x	
▪ clogging of canals by weeds?		x	
▪ introduction of increase in incidence of waterborne or water related diseases?		x	
▪ dangers to a safe and healthy working environment due to physical, chemical and biological hazards during project construction and operation?		x	
▪ large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		x	
▪ social conflicts if workers from other regions or countries are hired?		x	
▪ risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?	x		Zigzag narrow access road may cause accident during material transportation to and from the site.
▪ community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project (e.g., irrigation dams) are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?	x		
<b>Environmental Safeguard Specialist</b>  _____	<b>Date</b>  _____	<b>Signature</b>  _____	

## Appendix 2: Summary of Consultation Meeting at Cheung Kruos Village

Suggestion/Questions	Comments/Answer
<p>Presentation of the project background and the need and scope for additional scope of work on Srok dike. The flood caused erosion of the dike and this rectification will be under the liability period of the contractor which will be finish by end of March 2019, the consultant added. Lesson learned from this erosion, the MPWT is considering solution options to protect the dike for sustainable use. Two technical options are being considered: (i) geotextile with rock-fill or (ii) grouted riprap.</p> <p>The purpose of the meeting was to seek comments, reactions or suggestions as well as feedback/concern on any potential impact of the additional scope of works arising from the proposed two options.</p>	
<p><b>Local Authorities</b></p> <p><b>Involuntary Resettlement:</b> There is no structure or farming field to be affected by the proposed additional scope of work, since it will be implemented within the already built embankment/slope of the dike. The contractor can use the vacant public land near Cheung Kruos village for the camp site. It's the area that was used for the same purpose earlier during construction. No need for temporary or permanent land acquisition to prepare for the camp site.</p> <p><b>Environment:</b> Only minimal temporary impacts such as noise, dust, solid waste during construction are expected from the riprap or rockfill of the slope. Public land near Cheung Kruos village can be used for locating camp site.</p>	
<p><b>Mr. Dy Oeun:</b> Thank you to the team that pay attention to the erosion of the dike. He expressed that the dike will be stronger and last longer if any of the method will be used to build the dike. When the repair work will commence?</p>	<p><b>A:</b> The repair of the dike defects will commence and finish by March 2019. The timing for additional scope of work/strengthening of the dike is not known at the moment. However, local authorities and farmers will be informed about the schedule after the Contractor is selected.</p>
<p><b>Mr. Eng Hean:</b> Suggest to MPWT to help excavate small canal around the dike with one meter wide and one-meter depth at the toes of Srok dike embankment. A small portion of earth canal on the North-eastern side of the embankment was dug with the participation from farmers on the public land between the embankment and the cultivation field. Farmers need this small dike to further distribute to farther rice field. Can the project help?</p>	<p><b>A:</b> During the ADB review mission, we observed the small portion dug by farmers as mentioned. MPWT will need to study the request and revert back with the response. The mission confirms that the area is free from any resettlement impact. Local authority ought to discuss this with the Contractor who may need soil for the repair of the dike by digging the soil from the proposed canal location as mentioned.</p>
<p><b>Mr. Chuon Khon &amp; Dy Oeun:</b> Request to MPWT to make a better access for power tiller to drive up and down with no accident. Recently there is an accident/turnover of the power tiller because it is very slippery and too steep but no injury fortunately.</p>	<p><b>A:</b> The field observation, confirm very steep slope which may cause difficulty for driving the power tiller from the rice field to the dike crest. The slope standards need to be followed and calculated for the ease of vehicle to go up and down safely. PMU3 of MPWT will study the suggestion.</p>
<p><b>Q.</b> Is there a license quarry in Kampong Leaeng?</p>	<p><b>A:</b> Diamond Island Development Company Ltd. got license from the Ministry of Mine and Energy to operate the quarry site in Por commune, Kampong Leaeng district.</p>
<p><b>Pubic Consultation</b></p> <p>The safeguards consultant especially asked the farmers who have farm lands next to the dike to express their feeling and their concern of impacts to the rice field during the construction resulting from the proposed additional scope as well as the proposed one-meter canal at the toe of the slope to irrigate remote rice fields. The discussion open to any concern not only limited to social and environmental issue.</p>	

Suggestion/Questions	Comments/Answer
<p>There is concern on source of material to be used for the construction, but it is reported that there is an existing operation quarry site in Kampong Leaeng licensed by the Ministry of Mines and Energy, where all materials can be used for the construction of the dike.</p> <p>The consultation discussed the environmental impact during construction such as dust, vibration, noise, solid waste management as well as health and safety issues. However, this is a short-term impact understood by most of participants as they already had experience with previous construction work. Farmers pointed out that the previous contractor had a very good cooperation and relationship with farmers/villagers. The discussion found that the temporary impact on environment is acceptable and will not have much disturbance since the project site is far from the village.</p> <p>With regards to the fish conservation reservoir, the community expressed that there was no issue at all with previous contractor and hope no problem as well with new contractor since we all respect the laws and regulations and we all help protecting/conserving fish. There is committee to take care of the fish conservation and no illegal activity is allowed. For activities from the construction, there will be cement and rock which will not cause problem or pollution to the reservoir and affect the fish population. From previous experience, farmers think that there will be no negative impact to fish.</p>	
<p><b>Farmer:</b> His farm land is next to the Dike but the construction of one-meter canal is important so that farmers do not need to drain water from the reservoir by using the pipe buried under the dike to channel water to their rice field. Building the small canal can save water and farmers will not have difficulty to dive into the reservoir close and open the pipe in order to drain water. He confirmed that there will be no impact from the repair of the dike and digging the canal.</p>	<p><b>A.</b> The bypass pipe to drain water from the reservoir was observed during the field visit and agreed that the construction of the small canal is beneficial. This proposal will be conveyed to the attention of the PMU3 of MPWT for consideration. No promise can be made at this time.</p>
<p><b>Farmer:</b> Fishery is the secondary occupation for people in Kampong Leaeng district and this area looks like a sea during flood season. The boats may travel on top of the dike since it is not visible and may cause damage of the dike crest or slope again. On the other hand, people need safety area/site during strong wind/storm. As a farmer, I would like to request MPWT to consider building two safety shelters during flooding season and these can be of multipurpose use during harvesting season. By building the shelters the ship/boat's captain would also avoid the Srok dike and no concern about the damage that will cause by the transportation boat/ship.</p>	<p><b>A:</b> This suggestion is not within the work scope. There are many other options and approaches for funding for this if the issue can be escalated to district and provincial level.</p>

### Contract Provisions

The Technical Specifications of the Contract will include the following provisions on Environmental Protection.

This appendix 3 describes the environmental mitigation requirements to be followed by the Contractor and measures to be carried out by the Contractor related to environmental protection. Contractors shall follow all RGC laws and regulations related to environmental protection. Additionally, the Contractor shall provide an environmental mitigation and monitoring plan in connection with the submission of the Program based on the provisions of the Environmental Management Plan prepared during subproject preparation and set forth in these Technical Specifications.

The Engineer may interrupt the Contractor's work, if the provisions of the approved environmental plan are not followed. The Contractor shall also nominate one of his senior staff members to be responsible for follow-up of the implementation of the provisions of the environmental plan as well as for the guidance of the rest of the staff and reporting to the Engineer. The environmental monitoring and management plan shall be provided as a part of the method statement of the Contractor's proposed arrangements and methods of execution of the works required by of these Technical Specifications.

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#### **DO:**

1. *Limited working hour during the day time, especially in residential areas, and control driving speed;*
2. *Minimize earth excavation and appropriate disposal of spoil;*
3. *Minimize opening of new borrow pits and ensure proper closure (soil excavation from one-meter wide canal at the toe of slope can be used for repairing the existing defects);*
4. *Minimize traffic congestion, dust and noise generation;*
5. *Proper maintenance of construction equipment and vehicles;*
6. *Provide appropriate safety sign (day and night) and closely inform local residents;*
7. *Avoid spill of used oil and other toxic materials, including safe transportation and storage;*
8. *Apply good housekeeping in the construction and/or storage sites to ensure safety of workers and peoples (Gather up and remove debris to keep the work site orderly and safe; Plan and implement adequate disposal of scrap, waste and surplus materials; Keep the work area and all equipment tidy. Designate areas for waste materials and provide containers; Secure loose or light material that is stores on roofs or open floors; Keep materials at least 2m from openings, roof edges, excavations or trenches; Remove or bend over nails protruding from lumber; Keep hoses, power cords, welding leads from laying in heavily traveled walkways or areas; Ensure structural openings are covered/protected adequately; Provide the appropriate fire extinguishers for the materials found on-site. Keep fire extinguisher stations clear and accessible;*
9. *Ensure access to clean water and latrines by workers and provide mosquito net; and*
10. *Avoid social/cultural conflict between workers and local population.*

#### **DO NOT:**

1. *Do not permit rubbish to fall freely from any locations of the project and/or access by animals (dogs, cats, pigs). Use appropriate containers;*
  2. *Do not throw away tools or other materials;*
  3. *Do not raise or lower any tool or equipment by its own cable or supply hose;*
  4. *Use grounding straps equipped with clamps on containers to prevent static electricity buildup;*
  5. *Do not allow hunting of animals by workers in protected areas.*
-



**SPECIAL NOTE ON FLAMMABLE/EXPLOSIVE MATERIALS:**

1. Store flammable or explosive materials such as gasoline, oil and cleaning agents apart from other materials.
2. Keep flammable and explosive materials in proper containers with contents clearly marked.
3. Dispose of greasy, oily rags and other flammable materials in approved containers.
4. Store full barrels in an upright position.
5. Store empty barrels separately.
6. Post signs prohibiting smoking, open flames and other ignition sources in areas where flammable and explosive materials are stored or used.
7. Store and chain all compressed gas cylinders in an upright position.
8. Mark empty cylinders and store them separately from full or partially full cylinders.
9. Ventilate all storage areas properly.
10. Ensure that all electric fixtures and switches are explosion proof where flammable materials are stored.

**HEALTH, SAFETY AND ACCIDENTS**

The Contractor shall ensure, to the extent that is reasonable, the work environment health, safety and welfare of his employees including those of his sub-contractors and of all other persons on the site. The organization of the construction sites and work places shall generally be in accordance with the existing safety regulations in Cambodia. His responsibilities shall include:

- a. The provision and maintenance of construction plant, equipment and systems of work that are lighted, safe and without risks to health.
- b. The execution of suitable arrangements for ensuring safety and absence of risks to health in connection with the use, handling, storage, transport and disposal of articles and substances.
- c. The provision of protective clothing and equipment, first aid stations with such personnel and equipment as are necessary and such information, instruction, training and supervision as are necessary to ensure the health and safety at work of all persons employed on the works all in accordance with the Laws of Cambodia.
- d. The provision of a qualified officer or designation as Safety Officer of one of his senior staff who has specific knowledge of safety regulations, and experience of safety precautions on similar works and who shall advise on all matters affecting the safety of workmen and on measures to be taken to promote such safety.
- e. The provision and maintenance of access to all places on the site in a condition that is safe and without risk of injury.
- f. The provision of adequate waterborne sanitation, refuse collection and disposal, complying with the Laws of Cambodia, all local by-laws and to the satisfaction of the Engineer, for all houses, offices, workshops and laboratories erected on the camp site or sites.
- g. The provision of an adequate number of suitable latrines and other sanitary arrangements at sites where work is in progress to the satisfaction of the Medical Officer in the area.
- h. The execution of appropriate measures in consultation with the appropriate Public Health Authority to control within the Site, including the camp sites, mosquitoes, flies and pests including the application of suitable chemicals to breeding areas.
- i. Reporting details of any accident to the Engineer and the Police, if appropriate, as soon as possible after its occurrence.

The Contractor shall appoint one responsible member of his staff to act full-time as Safety Officer, and he shall notify the Engineer of such appointment. The Safety Officer shall be experienced in all matters relating to health and safety on Sites and shall be familiar with all relevant safety regulations and legislation. The Safety Officer shall have the power to receive instructions from the Engineer on matters relating to the health and safety of personnel on Site and the safe conduct of site

operations. The Safety Officer shall organize, and all workmen shall be required to attend an orientation/safety induction course within their first week on Site.

## **PROTECTION OF WATER RESOURCES**

- I. During construction, the contractor shall carry the full administrative and legal responsibility for any pollution of surface waters according to the existing legislation.
- II. The contractor shall ensure that no oil products, fuel, lubricants, detergents, paint or other harmful substances are introduced into streams and irrigation or drainage facilities.
- III. The storage or production or waste as well as filling and parking of machinery or cars is not permitted within a distance of 100 m of any stream/reservoir including drainage or irrigation facilities. The discharge of oil and fuel onto open soils is prohibited. Filling of any machinery shall be restricted to stationary and or mobile filling stations and shall exclusively be carried out by using suitable taps or nozzles. The contractor shall make all necessary arrangements to ensure that pollution of soils and groundwater will be avoided as far as possible.
- IV. The contractor shall submit a plan to the relevant authorities indicating the type of installation and their respective locations e.g. fuel and material storage, stationary filling sites, asphalt plant, mixing plant, car wash facilities etc. For each installation the contractor shall indicate the approximate closest distances to irrigation and drainage channels as well as public or private wells. For each installation beforehand the Contractor shall indicate in written form to the Engineer in addition to the above the approximate closest distances not less than 250 m to the specified green or protected areas.
- V. The Contractor shall submit to the Engineer an emergency plan for hazardous spills and leakage subject for approval before commencement of the works. This does not overrule requirements of the section i) above vi) the direct discharge of sewage from worker's camps into any stream is prohibited. Sewage from these installations shall be collected in septic tanks or soaking pits.

## **NOISE CONTROL**

The Contractor shall follow all the existing laws and regulations concerning the noise control in construction works, borrow pit activities. The contractor shall submit a plan to the relevant authorities indicating the type of installation and their respective locations e.g. mixing plant, concrete mixing equipment etc., which is subject for approval before commencement of the works. The Contractor shall elaborate and adopt effective measures both in management and technology to minimize noise, especially in proximity to residential areas. The contractor should conduct appropriate prior maintenance to minimize the noise-level of equipment. The use of high-level noise generating plant and equipment shall not be carried out at night unless otherwise approved by the Engineer. All noise not relating to the construction shall be avoided as far as possible.

## **DUST CONTROL**

The contractor will specify and follow mitigation measures to control dust from the operation of equipment and construction. If stone crushing operations are undertaken at site, care shall be taken to ensure that any dust emanating from the operations is contained to prevent nuisance to adjoining properties. The Contractor shall submit a plan indicating the proposed routes for material transport and make statements on the proposed method of dust control where transport through settlements cannot be avoided.

## **SOLID WASTE FROM CONSTRUCTION AND CONSTRUCTION CAMPS**

- I. Wherever possible recycling/re-use of materials shall be considered; (ii) As a rule, solid wastes generated during the construction phase shall be systematically collected, stored and disposed of in suitable locations approved by the subproject manager and in accordance with national and local relevant regulations.
- II. Construction debris shall generally be removed from the site in an orderly manner and disposed of in accordance with the existing regulations. (b) Clean soil material i.e. later indicated as Spoil Material that is not reusable shall be removed from the site and transported to the soil dumping areas in accordance with relevant regulation or designated in the design documents.
- III. Domestic waste from temporary construction camps shall be systematically collected and hauled to the designated areas in accordance with the relevant regulation. Should construction camps be erected within a reasonable distance to larger settlements, camp's solid waste may be integrated into existing collection and disposal facilities of nearby communities by their approval.

## **FIRE PROTECTION**

The Contractor shall comply with the provisions for fire protection according to RGC legislation or as otherwise directed by the Engineer.

## **MATERIALS**

The contractor will restrict the use of materials to sources appropriately licensed under RGC legislation for permits. The contractor will be responsible for having on file evidence of such permits.

## **SEWAGE**

The contractor will contain, collect, and treat any sewage in accordance with the requirements of environment protection and as approved by the Project Manager and the local department of environmental protection.

## **SOCIAL ISSUES**

The contractor will follow social mitigation actions as indicated in the designs provided for the hatchery. In the case of disputes, the contractor will refer the issue to the subproject manager. Specific concerns include but are not limited to access to residences, source of income generation, and water and other utilities.

## **CHANCE FINDS**

In line with Cambodia law on Protection of Cultural Heritage, when construction work or any other activity bring to light cultural property such as monuments, ruins, ancient objects, remains of inhabited sites, ancient burial sites, engravings or any property likely to be of interest in the study of prehistory, history, archaeology, ethnology, paleontology or other branches of science dealing with the past or of human sciences in general, the person finding the property and the owner of the site where it was discovered are obliged to stop the construction work and immediately make a declaration to the local police, who shall transmit it to the Governor of the province without delay. The Governor shall in turn inform the competent authority and shall take the measures necessary to ensure the protection of the objects and the site.

## **SUPERVISION AND MONITORING**

The Construction Supervision Consultant (CSC) and/or field engineer will be responsible for monitoring and verifying that all construction is in compliance with the terms of the EMP and that there have been deviations from neither the terms of this contract or the EMP.

## **PAYMENT**

Except when otherwise specified, there will be no payment for actions taken in support of the environmental protection as specified in this section. All costs associated with this task will be considered as being covered by the overall payments specified in the contract for the construction work (bill of quantities). All costs entailed in sampling, testing and in carrying out trial areas for the purpose of environmental protection as set in these Technical Specifications, shall be deemed to be included in the prices and rates entered by the Contractor in the Bill of Quantities.

#### Appendix 4: Updated Environmental Management Plan

Phase	Issue	Mitigation measures	Cost	Responsibility for implementation	Responsibility for supervision
<b>Pre-construction</b>					
	Site selection	Conduct a screening through careful site investigation with participation of PMU3, ESO staff; Consult with local authority and people; Make sure that problems with UXO, flood, erosion, depression, damage to significant cultural resources, land acquisition and resettlement, loss of biodiversity to be adequately managed before commencement of detailed design.	Preparation cost	PMU3/ESO	PMU3/ESO
	UXO clearance	UXO in the project area is not a serious concern as this is the additional work scope on newly constructed dike. However, PMU3 will inform/consult local authority and people about the project and get their feedback on UXO issue.	-	PMU3/ESO	PMU3/ESO
	Detailed design	Results from consultation meeting were taken into consideration by PMU3 and then incorporate into detailed design; Detailed design should be reviewed and appraised by the PMU3/ESO to ensure that the additional work scope will not face any environmental problem.	Preparation cost	DDIS	ESO
<b>Construction</b>	<b>Construction site</b>				
	Site clearance	Clearing and grubbing, debris before the commencement of the construction activities shall be done in accordance with local regulations.		Contractor	DDIS/PMU3/ESO
	<i>a) Noise disturbance including vibrations</i>	The construction equipment will strictly conform to Cambodia noise standards; Vehicles and equipment used shall be fitted with exhaust silencers and shall be checked regularly; Noisy construction activities will be at least a distance of 150 m from the nearest habitation; Construction activity should be restricted between 7.0 AM - 6.0 PM near habitations; Workers shall be provided with earplugs; Suitable noise	Construction cost	Contractor	DDIS/PMU3/ESO

Phase	Issue	Mitigation measures	Cost	Responsibility for implementation	Responsibility for supervision
		barriers or double-glazing of windows will be provided to the noise sensitive receptors.			
	<i>b) Dust/air quality</i>	Water will be sprayed on earthworks, Vehicles delivering fine materials like sand and fine aggregate shall be covered to reduce spills on roads; It shall be ensured that the air/dust from construction equipment and cement mixing machines are within the air/emission standards.	Construction cost	contractor	DDIS/PMU3/ESO
	<i>c) Traffic disruption during construction activity</i>	Traffic management plan with appropriate measures and signaling system to redirect traffic that are easily seen or easy to follow.	Construction cost	Contractor	DDIS/PMU3/ESO
	<i>d) Vehicle and pedestrian safety when there is no construction activity</i>	Traffic management plan with appropriate fencing, lighting and well-defined safety signs.	Construction cost	Contractor	DDIS/PMU3/ESO
	<i>e) Soil erosion</i>	Control soil erosion through rip-rap paving, rock-fill with geotextile, planting trees and grasses on the slope.	Construction cost	Contractor	DDIS/PMU3/ESO
	<i>f) Quarries, sand &amp; borrow pits</i>	Only licensed quarries and borrow sites will be used; precaution will be required to prevent the spillage of materials during transportation; all vehicles will be covered to avoid spillage during transportation of quarry materials.	Construction cost	Contractor	DDIS/PMU3/ESO
	<i>g) Hydrology and water quality</i>	<p>The construction will operate during dry season; use good quality and regular maintenance of construction machineries, trucks, vehicles.</p> <p>Clean all oil and grease leaking and the waste from machineries are store in a safe container and no disposal at field.</p> <p>Cement should be properly store in the warehouse and no cement waste, bags are disposed at field or near the reservoir.</p>	Construction cost	Contractor	DDIS/PMU3/ESO
	<i>h) Aquatic life</i>	Construction plan implement during dry season where water in the reservoir is low; avoid cutting flooded forest or trees in the reservoir; properly	Construction cost	Contractor	DDIS/PMU3/ESO

Phase	Issue	Mitigation measures	Cost	Responsibility for implementation	Responsibility for supervision
		<p>manage construction wastes and no disposal into the reservoir.</p> <p>Strictly enforce community fish conservation regulations and fishery laws; fishing or illegal fishing from construction workers is prohibited.</p>			
	<i>i) Water and soil pollution from improper material storage, management and usage and disposal of waste materials</i>	<p>Organize and cover material storage areas; isolate concrete, cement and other works from reservoir/ watercourse by using sealed formwork; isolate wash down areas of concrete trucks and other equipment from reservoir/watercourse by selecting areas for washing that are not free draining directly or indirectly into reservoir/watercourse.</p> <p>Dispose waste material at appropriate location protected from washing out, specified by local authorities. Some soil during the one-meter wide canal excavation will be used for the defects repair and no soil will be stored on the farmers' rice field.</p>	Construction cost	Contractor	DDIS/PMU3/ESO
	<i>j) Potential contamination of soil and water from improper usage of construction equipment</i>	Proper handling of lubricants, and solvents by secured storage; ensure proper usage of construction equipment; collect all waste and dispose to permitted waste place.	Construction cost	Contractor	DDIS/PMU3/ESO
	<i>k) Air pollution from improper maintenance of equipment</i>	Maintain construction equipment to good standard, improper functioning machinery that causes excessive pollution will be banned from the construction site.	Construction cost	Contractor	DDIS/PMU3/ESO
	<i>l) Workers health and safety</i>	<p>Provide public health on HIV/AIDS, safety, infection, prevention awareness.</p> <p>Provide workers with safety instructions and protective equipment; safe organization of bypassing traffic.</p>	Construction cost	Contractor	DDIS/PMU3/ESO
	<i>m) Land use (rice field)</i>	Take the excavated soil out and no piling of soil in the rice field;	Construction cost	Contractor	DDIS/PMU3/ESO
	<i>n) Archeological Chance finds</i>	All archeological property found during works should be dealt with according to the local rules and	Construction cost	Contractor	DDIS/PMU3/ESO

Phase	Issue	Mitigation measures	Cost	Responsibility for implementation	Responsibility for supervision
		regulations. In the event of the unexpected discovery of archeological objects the Contractor should immediately inform the PMU3/ESO/field engineer and the local authorities and follow their directions.			
<b>Construction</b>	<b>Worker's camp site conditions</b>				
	a) Cleanliness, solid waste handling and disposal facilities, drainage conditions	Provide workers with (a) clean water, (b) mobile toilets, and (c) garbage bins; separate toilets and showers should be provided for men and women; Avoid ponding at construction sites as mosquito habitats; Avoid blocking water flows by designing appropriate culverts; limit the spill of materials into reservoir during construction, no materials will be stored within 50 m of a reservoir/water course, including soil, spoil, aggregates, chemicals or other materials used during construction; Fuel storage, maintenance shop and vehicle cleaning areas must be placed at least 300 m away from the reservoir and will include enclosed drainage to ensure contaminated water does not cause pollution. If possible, all vehicles should be refueled at commercial gas stations in Kampong Leaeng to avoid storage of fuel on site. Inform and prohibit from fishing in the reservoir.	Construction cost	Contractor	DDIS/PMU3/ESO
	b) Closure of camp site	All waste materials, unused containers, oil waste and temporary septic tanks must be removed.  The site must be returned to the owners/local authority (if public land) in the same condition as it was obtained.  Clearance must be to the Engineers satisfaction. A 5% retention on final payments will be withheld until the sites are satisfactory cleared.	Construction cost	Contractor	DDIS/PMU3/ESO
<b>Operation</b>	<b>Fish Conservation</b>				
	Protection of fish population; control of diseases and parasites	All four water gates should be screened with synthetic netting.	Operation cost	Community	Community



Phase	Issue	Mitigation measures	Cost	Responsibility for implementation	Responsibility for supervision
		<p>Broodstock and progeny will be monitored daily for signs of disease and parasites and treated only when necessary with approved drugs and treatments.</p> <p>All kinds of fishing in the reservoir are not allowed. Limit the minimal water level in the reservoir.</p>			
	Solid waste	As the community members will stay near the reservoir, solid waste will be generated. The community members will establish a dust bin and the collected solid waste will be carried to the nearest collection point every week.	Operation cost	Community	Community
	Occupational health and safety	<p>Community staff operating the fish conservation center should be (i) annually trained in labour safety rules and first aid and (ii) provided with labour safety tools;</p> <p>The community fish communication center should be provided with qualified first-aid kits and fire-extinguishers at all times;</p> <p>Dangerous area, if any, should be provided with a warning signboard</p>	Operation cost	Construction cost	Contractor

## Appendix 5: Monitoring Plan

Phase	What parameter to be monitored?	Where parameter to be monitored?	How parameter to be monitored/type of monitoring equipment	When parameter to be monitored? (frequency of measurement or continuous)	Cost	Responsibility for monitoring
<b>Pre-construction</b>						
a) <i>Detailed design</i>	Technical specifications		Review and appraisal by PMU3 and ADB	Before commencement of construction	Subproject preparation cost	PMU3
<b>Construction</b>						
a) <i>Noise disturbance and vibrations</i>	noise levels (dB); sonometer	At and near work site	Inspection and supervision; according to Cambodia noise standards	once a month or on complaint	Included in subproject cost	ESO/field engineer/ PMU3/MoE
b) <i>Dust/air quality<sup>7</sup></i>	- TSP (24 hours average) - CO, NO <sub>2</sub> and SO <sub>2</sub> (1 hour average)	At and near work site	inspection	once every 3 months; unannounced inspections during material delivery and construction	Included in subproject cost	ESO/field engineer/ PMU3/MoE
c) <i>Traffic disruption during construction activity</i>	existence of traffic management plan; traffic patterns	At and near work site	inspection; observation	before works start; once per month at peak and non-peak periods	Included in subproject cost	ESO/field engineer/ PMU3/MoE
d) <i>Vehicle and pedestrian safety when there is no construction activity</i>	visibility and appropriateness	At and near work site	observation	once per month in the evening	Included in subproject cost	ESO/field engineer/ PMU3/MoE
e) <i>Soil erosion</i>	Turbidity	At work site	Visual observation by Supervisor	Construction stage	Included in subproject cost	ESO/field engineer/ PMU3/MoE
f) <i>Quarries, sand &amp; borrow pits</i>	Possession of official approval or	Quarry, sand & gravel borrow pits	inspection	Before work begins	Included in subproject cost	ESO/field engineer/ PMU3/MoE

<sup>7</sup> Technique and standard applicable to monitoring plan is in accordance with Sub-decree on the Control of Air Pollution and Noise Disturbance (No.42 ANK/BK)

Phase	What parameter to be monitored?	Where parameter to be monitored?	How parameter to be monitored/type of monitoring equipment	When parameter to be monitored? (frequency of measurement or continuous)	Cost	Responsibility for monitoring
	valid operation license					
<i>g) Hydrology and water quality</i>	Execution of work according to design	At work site	inspection; observation	During construction	Included in subproject cost	ESO/field engineer/ PMU3/MoE
<i>h) Aquatic life</i>	visibility and appropriateness	At work site	inspection; observation	During construction	Included in subproject cost	ESO/field engineer/ PMU3/MoE
<i>i) Water and soil pollution from improper material storage, management and usage</i>	water and soil quality (suspended solids, oils, pH value, heavy metals)	runoff from site, material storage areas; wash down areas of equipment	inspection; observation	during material delivery and construction, especially during precipitation (rain, , etc.)	Included in subproject cost	ESO/field engineer/ PMU3/MoE
<i>j) Water and soil pollution from improper disposal of waste materials</i>	water and soil quality (suspended solids, oils, pH value)	depository site	inspection; observation	once every 3 months during construction and on complaint	Included in subproject cost	ESO/field engineer/ PMU3/MoE
<i>k) Potential contamination of soil and water from improper maintenance of equipment</i>	water and soil quality (suspended solids, oil, lubricants, fuel, pH value)	At work site; construction equipment place	unannounced inspection	once every three months during construction, on complaint, and in case of spillage	Included in subproject cost	ESO/field engineer/ PMU3/MoE
<i>l) Air pollution from improper maintenance of equipment (machinery)</i>	Exhaust fumes, dust	At work site	Visual inspection during work	During work	Included in subproject cost	ESO/field engineer/ PMU3/MoE
<i>m) Worker health and safety</i>	protective equipment; organization of bypassing traffic	At work site	inspection	unannounced inspections during work	Included in subproject cost	ESO/field engineer/ PMU3/MoE
<i>n) Land use (rice field)</i>	visibility and appropriateness	At work site	inspection	unannounced inspections during work	Included in subproject cost	ESO/field engineer/ PMU3/MoE
<b>Construction</b>	<b>Worker's camp site conditions</b>					

Phase	What parameter to be monitored?	Where parameter to be monitored?	How parameter to be monitored/type of monitoring equipment	When parameter to be monitored? (frequency of measurement or continuous)	Cost	Responsibility for monitoring
<i>a) Overall workers' camp site set up</i>	Cleanliness, solid waste handling and disposal facilities, drainage conditions	On the camp site during construction activities	Unannounced inspection	According to the existing regulations/contract agreement	Included in subproject cost	ESO/field engineer/ PMU3/MoE
<i>b) Closure of camp site</i>	Cleanliness; waste clean up	compare to original state/condition	Unannounced inspection	According to the contract agreement	Included in subproject cost	ESO/field engineer/ PMU3/MoE

**Public Information Booklet**  
**CAM: Provincial Roads Improvement Project**  
**Additional Scope of Work of Srok Dike,**

Svay Rumpear Commune, Kampong Leaeng District, Kampong Chhnang

## **I. Project Introduction**

The ADB review mission, in February 2019, visited Srok Dike which was recently completed but eroded during the annual flooding season. According to the contract agreement, the Contractor will rectify the defects under liability period. In addition to the repair off the defects, MPWT proposes special slope protection measures for Srok Dike to be considered and implemented following the actual site condition before next flooding period for the sustainability of this dike. The mission also observed during the site visit that farmers receive benefits as they have water for irrigating their rice fields and the reservoir could irrigate more than 800 ha, according to consultation meeting with beneficiary farmers.

Hence the Ministry of Public Works and Transport (MPWT) is considering utilizing remaining fund saving from the Loan 8254 to propose for the Srok Dike slope protection. Two technical options are being considered: (i) geotextile with rock-fill or (ii) grouted riprap, with the estimated costs of \$352,450.00 and \$569,447.40, respectively. This additional work is estimated to be completed within four months.



## **II. Environmental Assessment of the Proposed Additional Scope of Work**

The consultation meeting with beneficiaries and people in the project area aimed for preparation of the updated environmental management plan (UEMP). The aim of the consultation is to inform about the project, its scope of works and get concerns, views and anticipated impacts from local authorities and people living in the project area. The potential risks or concerns from the additional work activities, which could directly or indirectly affect the environment, health and safety of the communities, are identified as followings:

- i. **Extraction of construction materials.** According to the Cambodia Law a license is required for the extraction of any natural resources such as stone and gravel. Also, crushing operators should have an environmental permit covering the operation of their equipment. The contractor for the subproject will be required to use only fully licensed and permitted operators as sources for raw materials.

- ii. **Construction related waste materials.** The contractor would be required to conform to environmental regulations and practice relating to proper disposal. Waste can be solid, liquid, or gaseous and each type has different methods of disposal and management.
- iii. **Temporary short-term impact.** Noise, dust, vibration, water pollution and contamination, land use pattern, solid waste management and traffic accident during the construction is a temporary and shorter impact which is inevitable. Noise levels will increase due to movement of construction machinery and vehicles. This impact will be minimized under the subproject by (i) specifying in all subproject contracts the responsibility of contractor to undertake appropriate work site mitigation actions as a part of their management of work sites, and (ii) the supervision of compliance of contractors by the construction supervision consultant/field engineer. Mitigation measures may include the following actions: use of sprinklers to wash down roads and suppress dust emissions during soil transport; cover vehicles to prevent spills and transport borrow materials during daytime only; reduce noise by using noise absorbing/protecting building materials, provide workers with ear plugs and helmets and generally prevented from prolonged exposure to high noise levels, etc. However, the magnitude of the impacts will not be substantial and can be mitigated with implementation of proper management; the structural works would be of small scale, and the location of the dike is not close to the residential/village area.

### III. Measures to Mitigate the Environmental Impacts

During the construction period, the DDIS/PMU3/ESO of MPWT will monitor the implementation of the UEMP, particularly measures related to the construction. The DDIS will ensure that all relevant issues (one-meter wide canal and access road/ramp for power tiller) are adequately addressed at the design revision stage, and MPWT/PMU3 will ensure that the contract document includes the relevant environment protection clauses.

The Contractor that will perform the civil works will also follow the requirements of the current related regulations. The DDIS that will assist the PMU3 in overall subproject management will also assist PMU3 in the supervision of environmental and social aspects. Compliance with the RGC regulations and the terms of the UEMP will be monitored and verified in the monthly reports submitted to the PMU3 by the consultant/field engineer, based on consultations with contractors and site visits. And then this monitoring report shall submit to ADB for endorsement and disclosure. Also, the consultant/field engineer will also look into any new critical issues that may come up during the civil works and suggest actions for various agencies. All impacts shall be strictly managed as below:

- a) **Noise disturbance including vibrations:** The construction equipment will strictly conform to Cambodia noise standards; Vehicles and equipment used shall be fitted with exhaust silencers and shall be checked regularly; Noisy construction activities will be at least a distance of 150 m from the nearest habitation; Construction activity should be restricted between 7.0 AM - 6.0 PM near habitations; Workers shall be provided with earplugs;
- b) **Dust/Air quality:** Water will be sprayed on earthworks, Vehicles delivering fine materials like sand and fine aggregate shall be covered to reduce spills on roads;
- c) **Traffic disruption during construction activity:** Traffic management plan with appropriate measures and signaling system to redirect traffic that are easily seen or easy to follow;
- d) **Soil erosion:** Control soil erosion through rip-rap paving, rock-fill with geotextile, planting trees and grasses on the slope;
- e) **Quarries, sand & borrow pits:** Only licensed quarries and borrow sites will be used; precaution will be required to prevent the spillage of materials during transportation; all vehicles will be covered to avoid spillage during transportation of quarry materials;
- f) **Aquatic life:** Construction plan implement during dry season where water in the reservoir is low; avoid cutting flooded forest or trees in the reservoir; properly manage construction wastes and no disposal into the reservoir. Strictly enforce community fish conservation regulations and fishery laws; fishing or illegal fishing from construction workers is prohibited;
- g) **Water and soil pollution:** Organize and cover material storage areas; isolate concrete, cement and other works from reservoir/ watercourse by using sealed formwork; isolate wash down areas of concrete trucks and other equipment from reservoir/watercourse by selecting areas for washing that are not free draining directly or indirectly into reservoir/watercourse;
- h) **Potential contamination of soil and water:** Proper handling of lubricants, and solvents by secured storage; ensure proper usage of construction equipment; collect all waste and dispose to permitted waste place;
- i) **Workers health and safety:** Provide public health on HIV/AIDS, safety, infection, prevention awareness. Provide workers with safety instructions and protective equipment; safe organization of bypassing traffic.

- j) **Archeological Chance finds:** All archeological property found during works should be dealt with according to the local rules and regulations. In the event of the unexpected discovery of archeological objects the Contractor should immediately inform the PMU3/ESO/field engineer and the local authorities and follow their directions. Or call to the hotline phone number shown in the construction display board at the site or phone number shown in this public information booklet.

#### IV. Grievance Redress Mechanism (GRM)

The generic project GRM will follow existing approved IEE of the project. The existing GRM steps are as following:

**First Stage:** The complaints and grievances can be presented verbally or in writing to the village chief, commune chief or ESO/PMU3 that was already established for PRIP. If after 15 days the aggrieved AP does not hear from the village and commune chiefs or ESO/PMU3, 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 Grievance Redress Committee.

**Third Stage:** The Provincial Grievance Redress Committee meets with the aggrieved party and tries to resolve the situation. Within 30 days of the submission of the grievance, the Committee must make a written decision and submit copies to the ESO/PMU3, and the AH.

**Final Stage:** If the aggrieved AP does not hear from the Provincial Grievance Redress Committee or is not satisfied, he/she can bring the case to Provincial Court. This is the final stage for adjudicating complaints.

However, the project will install construction sign board with hotline numbers so that AP can report the complaint or any wrong doing. Following are the hotline and ADB:

- **Ministry of Public Works and Transport**  
Corner of Preah Norodom Blvd and road 106, Phnom Penh, Cambodia  
Project Management Unit 3 hotline:
  - 078 99 95 95
  - 077 85 54 56
- **Accountability Mechanism of the ADB.** Affected people may always contact the Complaints Receiving Officer of the ADB through ADB Cambodia Residential Mission:  
29 Suramarit Blvd. (St.268), Sangkat Chatomuk, Khan Daun Penh, Phnom Penh, Cambodia;  
Tel: (+855) 23 215 805; (+855) 23 215 807;  
<http://www.adb.org/cambodia>

