KINGDOM OF CAMBODIA

NATION RELIGION KING

WORLD BANK GROUP

Cambodia Agricultural Sector Diversification Project (CADSP-P163264)

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

For

DBST Road Rehabilitation of 10km in Aphiwath Srok Yerng AC, So Sen Commune, Pey Chhor district, Kampong Cham Province

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List of Abbreviations

CASDP	Cambodia Agricultural Sector Diversification Project
DP	Development Plan
E&S	Environmental and Social
ECOPs	Environmental Code of Practices
EHS	Environmental Health and Safety
EIA	Environmental Impact Assessment
EMDP	Ethnic Minority Development Plan
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environment and Social Management Plan
EU	Environmental Unit
GAP	Good Agricultural Practices
GHG	Greenhouse Gasses
GNI	Gross National Income
GRM	Grievance Redress Mechanism
IEIA	Initial Environmental Impact Assessment
IPM	Integrated Pest Management
MAFF	Ministry of Agricultural Forestry and Fishery
MoE	Ministry of Environment
MOWRAM	Ministry of Water Resources and Meteorology
MRD	Ministry of Rural Development
PCO	Project Coordination Office
PCR	Physical Cultural Resource
PIM	Project Implementation Manual
PMP	Pesticide Management Plan
RPF	Resettlement Policy Framework
SEO	Safety and Environment Officer
WB	World Bank

I. Introduction

1. The Cambodia Agricultural Sector Diversification Project (CASDP) planned to reach the project development objective indicators at least: 1). Increase in the value of gross sales at benefitting farms for 5 percentages in year one, 10 percentages in year two and another 15 percentages at end target, 2). Increase in the volume of gross sale of benefitting farms for 5 percentages in year one, 10 percentages in year two and another 15 percentages at end target, 3). Increase in the value of gross sales of benefitting agribusinesses for 5 percentages in year one, 10 percentages in year two and another 15 percentages at end target, and 4). Share of non-rice production area of participating farmers increase 20 percentages in year one, 25 percentages in year two and another 20 percentages at end target.

2. In the period of January-June 2020, the overall progress has been achieved including the established Project Steering Committee (PSC). Also, the POM in Khmer and English version was developed, the two the main objective of this ESMP is to establish a set of mitigation and monitoring measures to minimize the adverse social and environmental impacts that can take place during the implementation stage of the subproject. The measures especially focus on sensitive receptors or sensitive locations. The ESMP also provides specific information about the monitoring program during construction stage including locations, frequency and reporting process. The ESMP contains guiding environmental principles and procedures for communication, reporting, training, monitoring and plan review to which all staff, consultants, supervisors, Contractors and sub-Contractors are required to comply with throughout the pre-construction, and constructions stages of the Subproject.

3. This document presents the Environmental Social Management Plan (ESMP), which has been prepared to ensure that the proposed CASDP is implemented in accordance with the World Bank operational policies (OP) and local legislation related to environmental protection. The main purpose of this ESMP is to serve as a valuable tool for identifying possible key environmental and social impacts that will result from the project and proposing mitigation measures to address the most significant impacts. The ESMP also provides the responsibilities of different parties involved in the project implementation. Although major environmental issues are not anticipated (the project has been categorized as environmental Category B in according to the World bank OP/BP 4.01 on Environmental Assessment) since the investments are directed on the rehabilitation of existing embankment infrastructure, the ESMP identifies several mitigation measures aimed at environment protection and maintenance of environmental conditions mainly during the civil works.

4. For the Road rehabilitation in Aphiwat Srok Yerng AC at So Sen commune, the PCO will be responsible for the supervision and monitoring of project-related environmental and social activities during the pre-construction, construction and operation phases as part of their functions. In line with this a Ministry of Rural Development (MRD) in the PCO will be assigned to be responsible for supervision of environmental management and for environmental monitoring. The major responsibilities of the environmental officer will be to ensure that:

i. Mitigation measures and monitoring of these activities are carried out in accordance with the ESMP;
ii. Environmental and social Monitoring program, comprising of taking samples and analysis are being carried out;
iii. Reporting is performed in compliance with World Bank requirements.

5. Contractors will be engaged by the MRD for construction. The MRD will include ESMP in the bid and contract documents. The bid and contract documents will specify requirement for contractors to be applied with Environmental Social Management Plan (ESMP) that developed by Safeguards team. The Contractor will be responsible for implementation mitigation and monitoring measures in the construction phase and their performance will be supervised and monitored by the PCO-MRD.

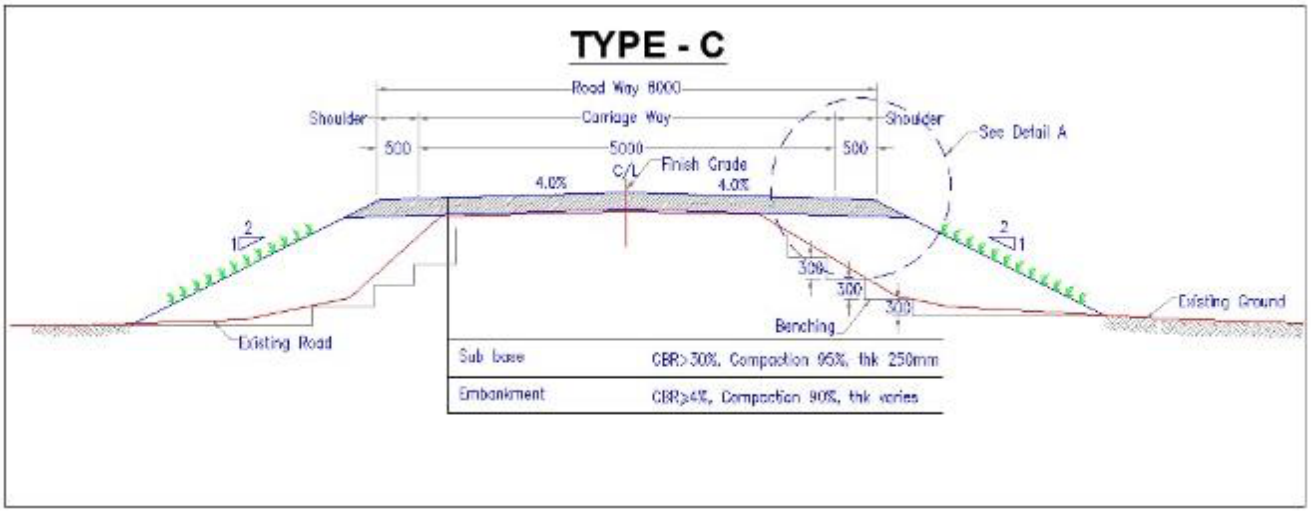
II. Sub-Project Description

2.1. Site Location

6. The proposed sub-project involves the rehabilitation of the existing road in So Sen Commune and Sramor commune, Prey Chhor District, Kampong Cham Province, which is approximately 150 kilometers east of Phnom Penh's capital. The sub-project site is accessible via National Road No. 7 and is approximately 70 kilometers from Kampong Cham city. The existing road width, according to the MRD survey team, ranges from 6 to 12 meters

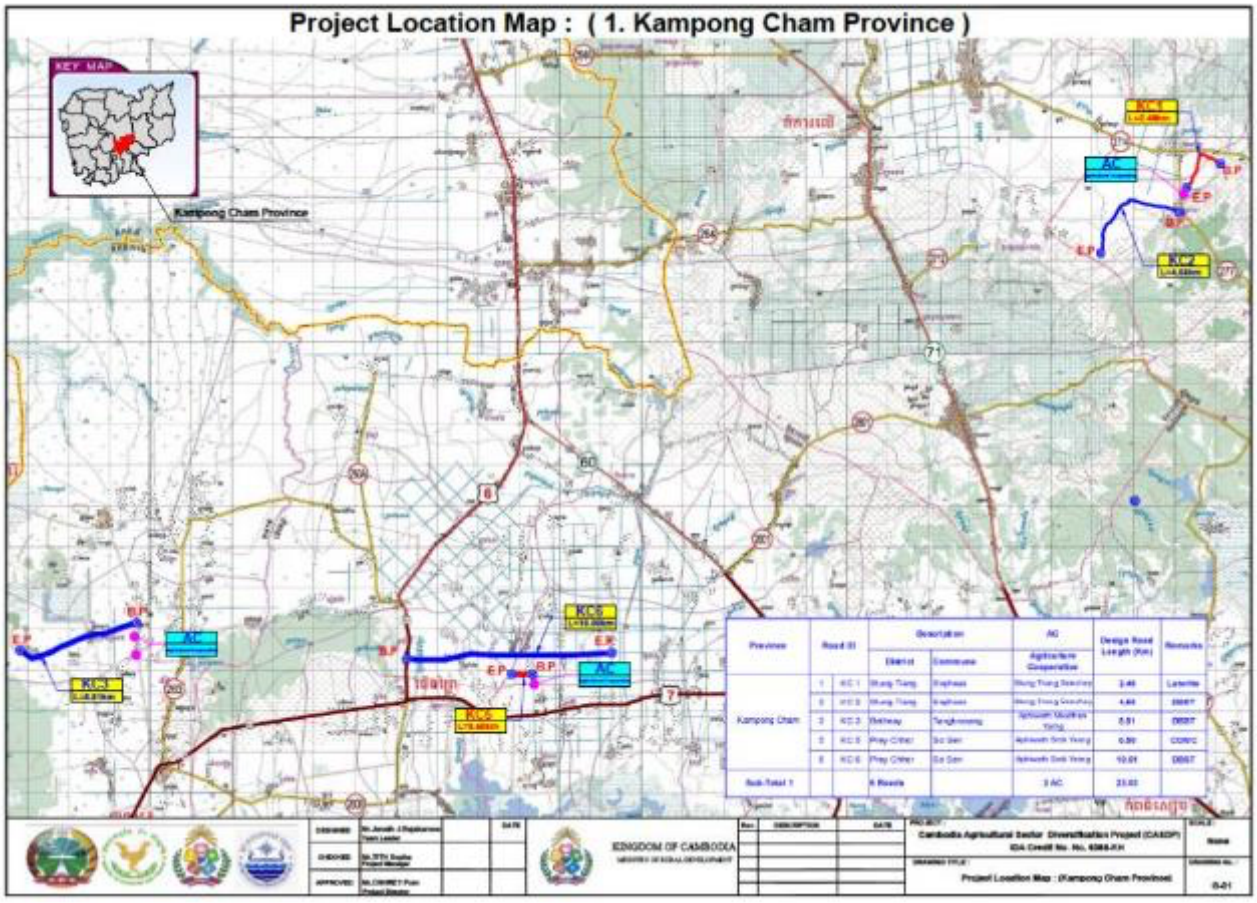
7. Under this subproject, a 10-kilometer unpaved existing road track will be rehabilitated into a DBST road. Originally the road width ranges between 5 to 6 meters. The project will not widen the road, but there are sections of the road will need road shoulders (see the design below Figure1: Designed Drawing).

Figure 1: Designed Drawing



8. This road connects the ten villages of Trapeang Reang, Chambork Thmor, Trapeang Thnot, So Sen, and Trouy Ou of So Sen commune and Sram Angkam, Sram Kaeut, Sram Lec, Sanhkae Pong, Pra Khnaor of Sramor commune provides access to the district center via National Road No. 7 and/or Road No. 6. The location of the road subproject is between the coordinates BP: N=1334883.042, E=508153.251 and EP: N=1335126.113, E=518108.007, as depicted in Figure During the rainy season, the majority of the road becomes muddy and waterlogged, and during the dry season, it is difficult to travel on by vehicles and creates dusty conditions that negatively impact the villagers who live near the road line. These villagers requested this road rehabilitation to the commune authorities. Given this, the unpaved road was requested to be rehabilitated to a DBST road. The road and location of the Agriculture Cooperative are depicted on the map below.

Figure 2: Sub project Map for DBST Road Rehabilitation at So Sen



2.2. Construction activities and Scheduled

Table 1: Summary Scope of Work for Aphiwat Srok Yerng AC Road Rehabilitation Sub-Project

BILL No. 2 - Earthworks and Allied Activities

Item No.	Description	Unit	Quantity
2.1(1)	Clearing and Grubbing	Sq.m	40,006
2.2(1)	Roadway Excavation, Common	Cu.m	322
2.2(2)	Roadway Excavation, Unsuitable	Cu.m	4,000
2.4(1)	Channel Excavation, Common	Cu.m	5,500
2.5(1)	Structural Excavation, Common	Cu.m	1,110
2.5(3)	Structural Backfill	Cu.m	174
2.5(4)	Crushed Rock materials less than 150mm size for foundation fill	Cu.m	20
2.6(1)	Embankment	Cu.m	71,775
2.7(1)	Removal of Existing Structures (drainage structures)	L.S	3

BILL No. 3 - Sub base and Base Course

Item No.	Description	Unit	Quantity
3.1(1)	Sub-base	Cu.m	20,484
3.3(1)	Aggregate Base Course	Cu.m	7,850

BILL No. 4 - Bituminous Works

Item No.	Description	Unit	Quantity
4.1(1)	Bituminous Prime Coat	Sq.m	54,333
4.1(2)	Cost of Bituminous Prime Material	Litre	41,866
4.2(1)	Bituminous Seal Coat, 19mm	Sq.m	52,333
4.2(2)	Bituminous Seal Coat, 12mm	Sq.m	52,333
4.2(3)	Sealing Aggregate, 19mm	Cu.m	994
4.2(4)	Sealing Aggregate, 12mm	Cu.m	628
4.2(5)	Cost of Bitumen Emulsions CRS-2	Litre	141,300

BILL NO. 5 - Structures

Item No.	Description	Unit	Quantity
5.1(3)	Concrete Class B1 (32MPa - 19mm)	Cu.m	413.12
5.1(6)	Concrete Class E (17MPa - 50mm)	Cu.m	73.58
5.2(2)	Grade 400 Deformed Reinforcing Bar	Tonne	36.53
5.6(1)	Railing (Concrete Railing)	L. metre	41.06
5.8(2)	Porous sand Backfill	Cu.m	47.77
5.13(1)	Survey for Bridges & Box Culverts	Number	3.00

BILL NO. 6 - Drainage and Protection Works

Item No.	Description	Unit	Quantity
6.1(3)	Reinforced Concrete Pipe, 1000mm (including Surrounding)	Metre	136
6.1(7)	Reinforced Concrete Pipe, 2@1000mm (including Surrounding)	Metre	16
6.1(11)	Reinforced Concrete Pipe, 3@1000mm (including Surrounding)	Metre	16
6.1(15)	Wing Wall of Pipe Culvert, 1000mm	Number	34
6.1(19)	Wing Wall of Pipe Culvert, 2@1000mm	Number	4
6.1(23)	Wing Wall of Pipe Culvert, 3@1000mm	Number	4
6.6(2)	Strip Sodding	Sq.m	63,475
6.7(2)	Topsoil for embankment slopes	Sq.m	63,475

BILL No. 7 - Ancillary Works

Item No.	Description	Unit	Quantity
7.4(1)	Guide Post	Number	64
7.5(1)	Sign Posts	L.metre	183
7.5(2)	Road Signs	Sq.m	22
7.5(8)	Concrete and Excavation to Sign Post Foundation	Nos	47
7.8(1)	Reflectorized Thermoplastic Markings, Yellow	Sq.m	713
7.10	Completion Monuments	Number	1

BILL No. 8 - Unexploded Ordnance

Item No.	Description	Unit	Quantity
8.2(1)	Mine/UXO detection, removal and disposal, Normal	Hectare	1.923
8.2(2)	Mine/UXO detection, removal and disposal, Intense	Hectare	6.784
8.3	Mine / UXO Risk Education	L.S	1.00

BILL NO. 9 - Miscellaneous

9.5	**Maintenance of Road During Construction Works**		

9.5(1)	Maintain Safe Traffic Operations	km-Month	400.00
9.6	**Progress Photographs**		
9.6(1)	Progress Photographs	Month	15.00
9.7	**Project Information Board**		
9.7(1)	Project Information Board	No	3.00
9.8	**Site Clean Up**		
9.8(1)	Site Clean Up	L.S	1.00
9.9	**Safeguards**		
9.9(1)	Maintain the Gender Action Plan and HIV/Aids & Human Trafficking Prevention Program	Month	15.00
9.9(2)	Environmental Monitoring Costs Preconstruction, Survey of sensitive receptors, water quality monitoring, Air quality monitoring, noise and vibrations monitoring to establish baselines	L.S	1.00
9.9(3)	Environmental monitoring costs during construction water quality monitoring, Air quality monitoring, noise and vibrations monitoring to ensure compliance and , Healthy (first aids kit) and safety (install: construction signboard, banner, etc. (provisional quantities), Safety staffs (Protective Helmet, Safety Hand Gloves, Reflective Safety Vest Safe Strap, Construction Boots, Safe Belts and other Personal protective equipment (PPE) has been supplied to the worker during construction, Worker's Camp will be construction, Safe drinking water and toilets for Workers and Measurement of Pandemic Covid-19 material: Masks, Alcohol for hand sanitizer (Note: Contractor may claim base on Invoice)	Month	15.00
9.9(4)	Environmental Management Plan (EMP) mitigation measures including ensuring water quality measures, ensuring air quality and dust suppression measures, noise and vibrations suppression measures, construction wastes and disposal measures, Sanitary wastes and disposal measures	L.S	1.00
9.10(1)	Detour Road	L.S	3.00

9. Table 2 shows the summary of the periodic and cumulative progress of work by the contractors from month March 2023 for all contract packages.

Table 2: Project Construction Scheduled

No.	Contract No.	Contract Activities	Contract Value including VOs($)	% Accomplishment (as of Nov 2023)
1.	MRD/CW..	Unexploded Ordnance	-	1 Month
		Earthworks and Allied Activities	-	1 Month
		Structures	-	1 Month
		Subbase and Base Course	-	1 Month
		Bituminous Works	-	1 Month
		Drainage and Protection Works	-	1 Month
		Ancillary Works	-	1 Month
		Miscellaneous	-	0.5 Month
		Safeguards	-	0.5 Month

Source: MRD, December 2022.

III. Baseline data

3.1 Project Area

10. This proposed DSBT road rehabilitation sub-project of So Sen commune and Sramor Commune, Prey Chhor district, connects ten villages, including Trapeang Reang, Chambork Thmor, Trapeang Thnot, So Sen, Trouy Ou, Sram Angkam, Sram Angkam Kaeut, Sram Angkam Lech, Sangkae Pong, and Pra Khnaor and provides access to the district center via National Roads No. 7 and N.6, the sub project work will take place in area that are already well trafficked, thus it is not likely to have a signification UXO risk, based on public consultation in May 2022, no one raised about the UOX risk at the proposed site as it was existing villages road since for may year ago. However, the UXO mine clearance expert in MRD collected the information about the UXO in the subproject area and MRD is expected do the mine clearance before any road rehabilitation began. Therefore, it is expected that any UXO risk not associated during the road rehabilitation stages. This dirt road is utilized not only by residents of the So Sen Commune, but also by residents of adjacent communes. The following image depicts the current road condition (Photo 2)

Figure 3: Original condition of road in So Sen commune

11. Under the outcome of the DBST Road, it is anticipated that the road will allow commune residents access to schools, health centers, and other nearby villages. Primarily, this road will provide inexpensive and rapid access for farmers to transport their agricultural products to the nearby market.

12. The proposed project builds on existing environmental practices under the CASDP funded by the World Bank. Based on the assessment (Environmental and Social Management Framework) carried out by PCO team in July 25, 2018 on the proposed road sections, no major adverse impacts have been observed on local environment and local people And as for social aspect, a resettlement impact screening was carried out on 8-13 May 2022. The screening resulted in total of 57 households will be affected land used, fence and trees, The impacts were very minimal, since the road design does not extend the road width, but in some sections of roads where road shoulders are required. The impacts include land used 36 households, number of trees lost to 20 households with a total 36 number of trees and 1 household will be affected fence.

13. The environmental impacts would be localized and minimal. During construction, preliminary emissions from heavy equipment, noise, air pollution, water quality, construction debris (likely the installation of construction materials and machines along the roads or in front of local community houses and small shops), and short-term disruption to daily business operations may occur (likely the accessibility to small shops,). However, these problems can be mitigated by employing good construction practices and by supervising and monitoring the work closely.

14. ***Mitigation Measures*** - Spraying of water is the main way of controlling dust. Water is, in any case, required to be added to fill material during the rehabilitation works and in sensitive area such as home/business and schools. These measures will be taken by the contractor in compliance with the ESMP. Fuel and lubricant spill can occur at contractor work camp while maintaining and washing equipment and work vehicle.

15. The assessment observed the daily business activities in the communities along this road sections and resumed quick discussion with local authority (such as local small shops, Bridges etc.). It is expected that the construction of side drainages may cause some minimal disturbance to safety/health of people living nearby). The side drainages are mainly rehabilitation of the existing ones; thus, no impacts on land will occur. Equally, the drainage work may cause disturbance to transportation or travelling or students specifically these activities may limit the accessibility of villagers from the road to national road. Besides, some mobile tables, cooks, and/or hawkers may have to be cleared from the pedestrian ways being used by local small shop owners. This assessment, based on comments from local shop owners and discussion with road engineers of CASDP, proposed site specific ESMPs descried in table 4 below. Mitigation measure matrix.

3.2 Topography

16. The topography of the road subproject area in So Sen commune (Kampong Cham is a very flat alluvial plain of clays and sands bounded along the small canal by floodplain silts. of Kampong Cham province. This stretch of road is considered particularly important from the point of view of rice fields, crop, small trees and fisheries biodiversity in paddy rice.

Figure 4: Satellite Map of the So Sen subproject area

17. ***Surface water:*** No comprehensive water quality data for the subproject areas water bodies currently exist. For the road subproject, dry season water quality was sampled by the consultation with local authority.

18. ***Water Uses:*** Well pumps and ring well are the main water resource for used of community. They have. The villagers get water through existing well pumps and ring wells and small sub canal. Other resource of water is rainfall in command area, When the people need the water to supplement to field, they use pump for irrigation and used.

19. ***Land Use:*** Land use in the subproject areas is agricultural, comprising actively farmed paddy fields or abandoned paddies, in both actively farmed paddy fields and abandoned paddies, a mixture of natural and plantation-escaped trees and shrubs have established along the bundled boundaries of fields, along roadsides. In abandoned paddies there is adventitious growth of shrubs, weeds and grasses. For the village road subproject, the water quality in the main intermittent creek line over which the road passes were observed by Safeguards team. Land in these villages is divided into four main categories: (i) residential land or land for household compound including animal raising and home gardening activities; (ii) common or public land for public purpose; (iii) land for crop farming (short- and long-term farming); and (iv) community land or AC's land area And the subproject will cause some minimal impact on land and some minimal assets (mainly fruit trees). Following some fully informed consultation with the affected households, all of them (57 households) have voluntarily donated their loss of land/assets. Documentation of these voluntary land donations has been carried out properly and is attached to this ESMP as Annex 5: List of Voluntary Contribution of Land and Other Assets.

20. ***Soil and Water Pollution**:* The road subproject area in So Sen commune (Kampong Cham) is a very flat alluvial plain of clays, gravel, silt and sands bounded along the four villages and during construction activities, when using machinery, there is a possibility of soil contamination due to accidental spills of oils and fuel from construction machinery. In the area of construction works, construction waste is generated which, if not properly disposed of, may result in minor impacts.

21. At the resent of the road condition there are small sub canal is along the road and only two bridges are crossing the road. Current condition of the road is muddy, slippery while raining and flooded during wet season and the construction risk impact on it the earthworks for the sub-project activities might cause damage small sub canal and erosion on embankment slopes and the sexing bridge is impact slope by excavator. Since those are the natural construction impact associated which will be no any harm to the natural tree or the water inhabitants. There are 17 natural small water ways that have been identified, and 17 drainage structures this include two bridges are expected to be installed therefore no impact on the natural water ways or habitats by the road rehabilitation.

22. ***Mitigation Measures**:* Excavation will be dig old sub canal that there is slope and water flow easily and will not excavator be done in such a way that the slopped of the existing bridge by putting a protective barrier to avoid impact on the natural habitats.

3.3 Socioeconomic Status

23. The socioeconomic status of people in five village can be divided into four categories according to the national wealth classification (Ministry of Planning, Kingdom of Cambodia). They are: 1) very poor which is considered as poor I, 2) poor which is considered as poor II, 3) medium and 4) better-off. All poor I and poor II got the identification card from the government, especially these categories have been set up by Ministry of Planning (MOP) and officially approved by the Cambodian Government.

24. The highest percentage (7%) of very poor and 9% of poor live in Tropeang Thnot village, followed closely by 7% in Trppeang Reang village. When combine very poor and poor categories, all of the population in fives villages are living in very poverty and Poorness in all village; when very poor and poor categories are combined. The number of medium and well-off households is highest in Pra Khnaor village (93%). (Table 3)

25. It was noted that the proposed road provides access to the provincial road network, which will increase economic growth by reducing transport costs for the movement of people. The survey reveals that pedestrians, bicyclists, motorcyclists, moto trailers, and dump trucks are the main road users, which benefits the whole community, including village pig grower.

Table 3: Wealth Classification in the Subproject Villages

No	Villages	Wealth Classification			
		Very Poor %	Poor %	Medium%	Well Off%
1	Trapeang Reang	7	7	7	79
2	Trapeang Thnot	7	9	2	82
3	Chambork Thmar	4	5	8	83
4	Trouy Ou	2	6	16	76
5	So Sen	3	5	3	88
6	Sram Angkam	0	3	9	88
7	Sram Kaeut	0	4	7	89
8	Sram Lech	0	8	4	88
9	Sanhkae Pong	0	4	5	91
10	Pra Khnaor	0	3	4	93

IV. Potential impacts and mitigation measures

26. Since the existing infrastructure, facilities and equipment will be rehabilitated, reconstructed, repaired and replaced during the realization of the project, impacts on environment will be a consequence of human presence and construction machines, and the nature of construction works at a location, which are limited to the location of works or its surrounding vicinity. Social impacts include occupational health and safety of workers, impacts on nearby community (caused by construction activities and presence of workers, such as communicative diseases, including Covid, and impacts caused by labor influx. There will be around 30-40 workers who will work for this subproject. However, these workers will be hired from within community. Therefore, the impacts related to Sexual Exploitation and Abuse/Sexual Harassment (SEA/SH) will be minimal. These workers will need to be trained in OHS as well as in gender sensitivity including SEA/SH. They will be required to sign/read workers' code of conduct.

27. ***Mitigation Measures****:* The environmental impacts identified at this stage are preliminary in nature and will need to be further elaborated specifically (subproject wise) and potential for occurrence has to be ascertained during further stages of subproject design and implementation. This section details out the potential environmental impacts of the sub-projects funded by WB under CASDP.

28. Proposes mitigation measures for social impact: (i) occupational health and safety: Contractors also are required to comply with Communicable Disease Control Department of Ministry of Health on COVID 19 regulations and policies to protect themselves from COVID 19, (ii) community disturbance: Site manager or staff who is responsible for environment, health and safety should regularly orient/train workers or staff to avoid any conflict may happen in advance (iii) gender based violence: minimize labor influx as much as possible promoting local recruitment, toilet facilities for women should be accessible from place of work, strict Code of Conduct for workers with no tolerance for physical or verbal abuse of women or children , training to workers on proper conduct around women and children, GBV, Contractor's Code of Conduct and minimum working age.

29. The proposed road will be in total of 57 Ahs affected and land used is 36 households, 36 number of trees and 1 household will be impact fence that they have willing to agreed donation to the project.

4.1 Erosion of embankment slopes

a. ***Impact*** **-** The earthworks for the sub-project activities might cause negative impacts in form of erosion on embankment slopes, dust, noise and vibration to disturb the local people.

b. ***Mitigation Measures*** - Excavation and/or filling will be done in such a way that the slope of the embankment should be within right of way and will not disrupt drainage problems. The Contractor should use erosion control measures such as re-vegetation of disturbed areas and placing of tarps. The Contractor shall stabilize the cleared areas not used for rehabilitation activities with vegetation or with the appropriate surface treatments as soon as practicable following completion of activities.

4.2 Traffic Accidents:

a. ***Impact****:* All along the road with special attention to area close to sensitive receptors, especial school.

b. ***Mitigation Measures***: Road design should make safety a priority, such as by widening and sealing shoulders, where land ai available, through better marking and signage, introducing traffic calming measures at critical location, and measures to safeguard pedestrians safety, including for women and children from local community who use roads to travel to schools, market and hospitals.

4.3 Potential air pollution – Dust

a. ***Impact*** **-** Possible sources of air pollution will be dust due to maintenance activities, machinery movement and other sources. Rehabilitation works involve breaking up, digging, crushing, transporting, and dumping small quantities of dry materials. Locally, the air quality may experience some moderate

and temporary deterioration due to dust from construction traffic and elevated levels of nitrogen oxide (NOx) and sulphur oxide (SOx) from construction equipment exhausts. The dust may settle on vegetation, crops, structures and buildings.

b. ***Mitigation Measures*** **-** Spraying of water is the main way of controlling dust. Water is, in any case, required to be added to fill material during the rehabilitation works.

4.4 Potential water contamination

a. ***Impact*** **-** Water contamination may occur during the execution of the project from site run off, spills from the equipment maintenance areas and sanitary wastewater effluent from the work camps. As for the potential pollution during operation, these are mostly limited to accidents. In such a case, procedures for action in incidental situations, as defined by the Ministry of Interior and in the Water Law, will apply.

b. ***Mitigation Measures*** **-** Fuel and lubricant spills can occur at the Contractor's work camp while maintaining and washing equipment and work vehicles. During the normal operations, these areas should be equipped with the adequately sized, gravity oil separator. Should spills occur, to mitigate the problem the Contractor should use absorbing materials, such as absorbent mats/fabrics, or sand and scrape off the contaminated soils and dispose them in approved facility, in accordance with the Water Law.

4.5 Potential contamination of soils due to pesticide usage and improvement proper waste disposal

a. ***Impact*** **-** Potential contamination of soils and watercourses as a result of improper disposal of liquid and solid wastes from rehabilitation activities.

b. ***Mitigation Measures*** **-** The mitigation measure to avoid contamination of soils and watercourses is to ensure that waste materials are properly disposed to the suitable locations. Partly, inert waste materials can be used as filling material. Contractor should produce a Waste Management Plan for the Project. Mitigation measures should, among other requirement, contain contractor obligations to:

- locate the garbage pit/waste disposal site min 500 m away from the residence so that peoples are not disturbed with the odor likely to be produced from anaerobic decomposition of wastes at the waste dumping places. Encompass the waste dumping place by fencing and tree plantation to prevent children to enter and play with. All solid waste will be collected and removed from the work camps and disposed in approval waste disposal sites.
- In case oil and grease are trapped for reuse in a minimum 60cm thick lined pit, care shall be taken to ensure that the pit should be located at the lowest end of the site and away from the residential areas. In case of filling of low-lying areas with wastes, it needs to be ensured that the level matches with the surrounding areas. In this case care should be taken that these low-lying areas are not used for rainwater storage

4.6 Equipment maintenance and fueling

a. ***Impact*** **-** **e**quipment maintenance and fueling may cause contamination of soils and watercourses, including groundwater, if handling of lubricants, fuels and solvents is improper or careless.

b. ***Mitigation Measures*** **-** To avoid damage to natural environment there is a need to ensure proper handling of lubricants, fuels and solvents while maintaining the equipment.

4.7 Occupational Health and Safety

a. ***Impacts*** **-** Construction workers may be affected adversely due to hazardous working environments where high noise, dust, unsafe movement of machinery etc. may be present.

b. ***Mitigation Measures*** **-** The Contractor shall instruct his workers in health and safety matters, and require from the workers to use the provided personal safety equipment. Contractor has to

ensure that all operators of heavy or dangerous machinery are properly trained/certified, and also insured. He will have to provide first aid facilities, rapid availability of trained paramedical personnel, and emergency transport to nearest hospital with accident and emergency facilities.

4.8 Noise

a. ***Impact*** **-** Noise caused by the rehabilitation works will have only a temporary impact. Although temporary and mostly moderate, noise impacts in the vicinity of residential areas may cause negative health impact, if not mitigated.

b. ***Mitigation Measures*** **-** In sensitive areas (schools, nature parks, shops, pagoda, hospitals) special care regarding noise emission will be taken by the Contractor, strictly respecting the ESMP requirements. In case of noise disturbance with noise emissions which are above permitted level, temporary noise barriers should be considered as appropriate mitigation measure. Awareness building and administrative measures should be taken to ensure proper maintenance of vehicles. In case of exceeded noise limits for sensitive areas the Contractor should erect temporary shields to prevent a free noise spreading to the sensitive receptors.

30. The mitigation measures will be incorporated into the tender documents, constructioncontracts, and operational management procedures. Contractors, Key Implementation Agencies, MRD/PCO and CC will implement these measures, depending upon sub-project phases. The effectiveness of these measures will be carefully monitored to confirm if improvements needed, and The environmental and social impacts and mitigation measures outlined in Table 4 as below: