ENVIRONMENTAL MANAGEMENT PLAN – DEVDAHA ROADS AND DRAINS COMPONENT OF WUC SUBPROJECT

A. Introduction

1. ADB's Safeguard Policy Statement (SPS) 2009 requires preparation of an Environmental Management Plan (EMP) to addresses the potential impacts and risks identified by the environmental assessment, in this case initial environmental examination (IEE) prepared for the subproject of "Improvement to Road, Drains and Other Infrastructure in Five Towns (Tilottama, Devdaha, Sainamaina, Lumbini and Sidharthanagar) in Western Urban Corridor (WUC)", one of the subprojects proposed under the ADB funded Urban Resilience and Livability Improvement Project (URLIP) in Nepal. This IEE is prepared includes various components, a separate EMP is prepared for each component. This EMP is prepared for the Roads and drains component in Devdaha town.

B. Environmental Management Plan

2. EMP will guide environmental management implementation, supervision, and monitoring by project agencies and their contractors, and ensure construction and operation of the project are undertaken in a responsible, non-detrimental manner. The EMP aims to (i) ensure project implementation by the Department of Urban Development and Building Construction (DUDBC) complies with ADB's Safeguard Policy Statement 2009 requirements and international good practice as set out in the IFC Environment, Health and Safety (EHS) general and sector guidelines and ILO safety and health in construction and worker accommodation guidelines, and (ii) ensure project implementation will comply with applicable environmental, health and safety requirements of the Government of Nepal (including international agreements it is a signatory too) as well as local laws.

3. This EMP provides mitigation measures to reduce all negative impacts to acceptable level and measures to monitor the same. EMP will be included in the bid documents and will be further reviewed and updated during implementation if there are changes such as in project design or site conditions. Bidding and contract documents will include specific provisions requiring contractors to comply with: (i) all applicable labor laws and core labor standards on (a) prohibition of child labor as defined in national legislation for construction and maintenance activities; (b) equal pay for equal work of equal value regardless of gender, ethnicity, or caste; and (c) elimination of forced labor; and with (ii) the requirement to disseminate information on sexually transmitted diseases, including HIV/AIDS, to employees and local communities surrounding the proposed project sites

4. The EMP will be made binding on all contractors operating on the site and will be included in the contractual clauses. Non-compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance. Contractor will be required to (i) establish an operational system for managing environmental impacts; (ii) carry out all of the monitoring and mitigation measures set forth in the EMP; and (iii) implement any corrective or preventative actions set out in safeguards monitoring reports that the employer will prepare from time to time to monitor implementation of this IEE and EMP. The contractor shall allocate budget for compliance with these EMP measures, requirements and actions. The contractor will be required to submit to PIU, for review and approval, a site-specific environmental management plan (SEMP). No works can commence prior to approval of SEMP. A copy of the EMP/SEMP must be kept at work sites at all times.

5. The following tables show the potential environmental impacts, proposed mitigation measures and responsible agencies for implementation and monitoring.

C. Proposed Devdaha Component / Contract Package

6. Description of subproject components under the URLIP proposed in WUC municipality of Devdaha is provided in this section. These details are based on the final designs of roads and drains. This component included improvement of three existing roads: (i) Banchauki - MaydeviPark - Mildanda - Buddha Circut Road, (ii) Bhaluhipul - Medical College - Bhatatol - Mukhiya Tol - Piparahi Road, and (iii) Shitalnagar-Bhawanipur-Soiya Road.

1. Banchauki - MaydeviPark - Mildanda - Buddha Circut Road

Table 1: Proposed Scheme Comparison for Banchauki Mayadevi Path Mildanda Buddha Circuit Road Section

S.N.	Elements of component	Existing Scenario	Proposed Scheme
1	Length of Road	4.94 km	4.94 km
2	ROW Declared by municipality	12 m	12 m
3	Total Road Width	4-11.5 m	11.5 m
4	Carriageway	Average 6 m	7.5 m
5	Pavement type	The road sections are combination of premix carpet section and gravel section.	Double lane upgradation with the 50 mm surface course of asphalt concrete, 150 mm of base course and 250 mm of sub base with proper grade and camber
6	Side Drain	There is drain and 35 m of brick canal at both side in road sections. -455m of Drain along the left side of the road. -655m of Drain along both side of the road. The proposed road is not in flooded zone.	PCC surface drain of width 0.25m (included in carriage way width) Storm water drain size of Type A – 0.45 X 0.65m Storm water drain size of Type B – 0.6 X 0.8 m Storm water drain size of Type C – 0.75 X 0.95 m.
7	Cross drainage Structures	- 2 Nos Pipe Culverts - 12 Nos Pipe Crossings - 26 Nos of Side RCC Slabs	Rehabilitation of existing pipe culverts and slabs in order to make double lane and adding structures as per requirement.
8	Protection works	Nil	Retaining wall/slope protection measures as per requirement.
9	Traffic signs/signage and road marking	Nil	Provided all along the road to ensure maximum safety to pedestrian and vehicular traffic.
10	Road furniture (streetlights, delineators et)	Nil	Streetlights of height 9 m @ 25 m interval.
11	Utility	All wires and cable are hanging above ground and are in unmanaged condition -1 Transformer	Shifting of electric poles, transformer and telephone poles in coordination with municipality.

Source: Detailed Project Report, 2024

2. Bahluhipul Medical college Batatol Mukhiya Tol Piparahiya road section

Table 2: Proposed Scheme Comparison for Bahluhipul Medical college Batatol Mukhiya Tol Piparahiya road section

S.N.	Description	Existing Scenario	Proposed Scheme
1	Length of Road	7.22 km	7.22 km
2	Right of Way (ROW) Declared by municipality	12 m	12 m
3	Total Road Width	5-11 m	11.5 m
4	Carriageway	Average 5.5 m	7.5 m
5	Pavement type	Most of the road sections are poor premix carpet and remaining sections are gravel road.	Double lane upgradation with the 50 mm surface course of asphalt concrete, 150 mm of base course and 250 mm of sub base with proper grade and camber
6	Side Drain	There is 3.85 Km earthen drain in both side and 54m length of canal along the road and canal (Singha Canal) crossing in road sections. During heavy rainfall, Pluvial flooding in few road sections where road is graveled and blacktopped is damaged.	PCC surface drain of width 0.25m (included in carriageway width) Storm water drain size of Type A – 0.45 X 0.65m Storm water drain size of Type B – 0.6 X 0.8 m Storm water drain size of Type C – 0.75 X 0.95 m. The size of side drain will be different in Canal sections. 289 households directly get benefit from the proposed drain.
7	Cross drainage Structures	- 7 Nos Pipe Culverts - 20 Nos Slab Culverts -2 Nos of Side RCC Slabs - Bhaluhi Khola Bridge (30m) - Ghodaha Khola Bridge (74 m) - Bangali Khola Bridge (37.5m)	Rehabilitation of existing pipe culverts and slabs in order to make double lane and adding structures as per requirement.
8	Protection works	Protection works like river training works are only at passing bridge area of river	Retaining wall/slope protection measures as per requirement.
9	Road furniture (streetlights, delineators et)	Nil	Streetlights of height 9 m @ 25 m interval.
10	Utility	All wires and cable are hanging above ground and are in unmanaged condition - 1 Transformer	Shifting of electric poles, transformers and telephone poles with coordination with municipality.

Source: Detailed Project Report, 2024

3. **Shitalnagar-Bhawanipur-Soiya Road**

Table 3: Proposed Scheme Comparison of Shitalnagar-Bhawanipur-Soiya Road

S. N.	Description	Existing Scenario	Proposed Scheme
1.	Length of Road	4.79 km	4.79 km
2.	Right of Way (ROW) Declared by municipality	12 m	14 m
3.	Total Road Width	3.7-7.5 m	11.5 m
4.	Carriageway	Average 6.0 m	7.5 m
5.	Pavement type	Premix Carpet	Double lane upgradation with the 50 mm surface course of asphalt concrete, 150 mm of base course and 250 mm of sub base with proper grade and camber
6.	Median/Landscape or Green land areas	No median provided and lack of green space	Median is provided. Greeneries and plantation shall be done in interval of 10 meters over sidewalks wherever space is available
7.	Parking	Haphazard parking on shoulder and carriageway area obstructing traffic movement	Due to space restriction, separate parking is not provided however, parking space can be provided if public land available in the road vicinity.
8.	Cycle track	Nil	Not provided due to space restriction. However, alternative typical road section drawings with cycle tracks are proposed.

Source: Detailed Project Report, 2024

D. Institutional Arrangements and EMP Implementation Responsibilities

7. The Ministry of Urban Development through the Department of Urban Development and Building Construction (DUDBC) is the executing agency of the URLIP. Project Coordination Office (PCO), established within DUDBC is responsible for the overall management of the project. PCO will be supported by Project Management and Capacity Development Consultant (PMCDC), and Institutional Strengthening and Community Participation Consultant (ISCPC). Municipalities will be the key implementing units of the project. The PIU with the support of the Supervision and Design Consultant (SDC) is responsible for environmental safeguards implementation, compliance, monitoring, and reporting to ADB. Devdaha municipality is the implementing agency of this component.

8. The PCO is headed by Project Director and supported by three Deputy Project Directors (DPDs) – DPD WUC cluster, DPD Pokhara and Janakpur cluster, and DPD for Urban Planning and Development. Environment safeguards officers of engineer rank in PCO, reporting to DPDs, will be responsible for environmental safeguards compliance, planning, and implementation as per the agreed environmental assessment and review framework, IEEs and EMPs prepared consistent with the ADB's SPS and GON rules and regulations. At PIU level in each municipality, a senior engineer will be the Safeguards Focal and deputy project manager will be designated as environmental officer, responsible for ensuring implementation and compliance with environmental safeguards. PMCDC, staffed with environmental safeguards specialist, and will assist PCO in all environmental safeguards tasks and to ensure compliance. SDC, staffed with environmental safeguards specialist, will assist PIU in all tasks.

9. Implementation arrangements for safeguards in implementation in URLIP presented

in Figure 1, and roles and responsibilities are given in Table 4.

Figure 1: Implementation Arrangement for Safeguard Implementation

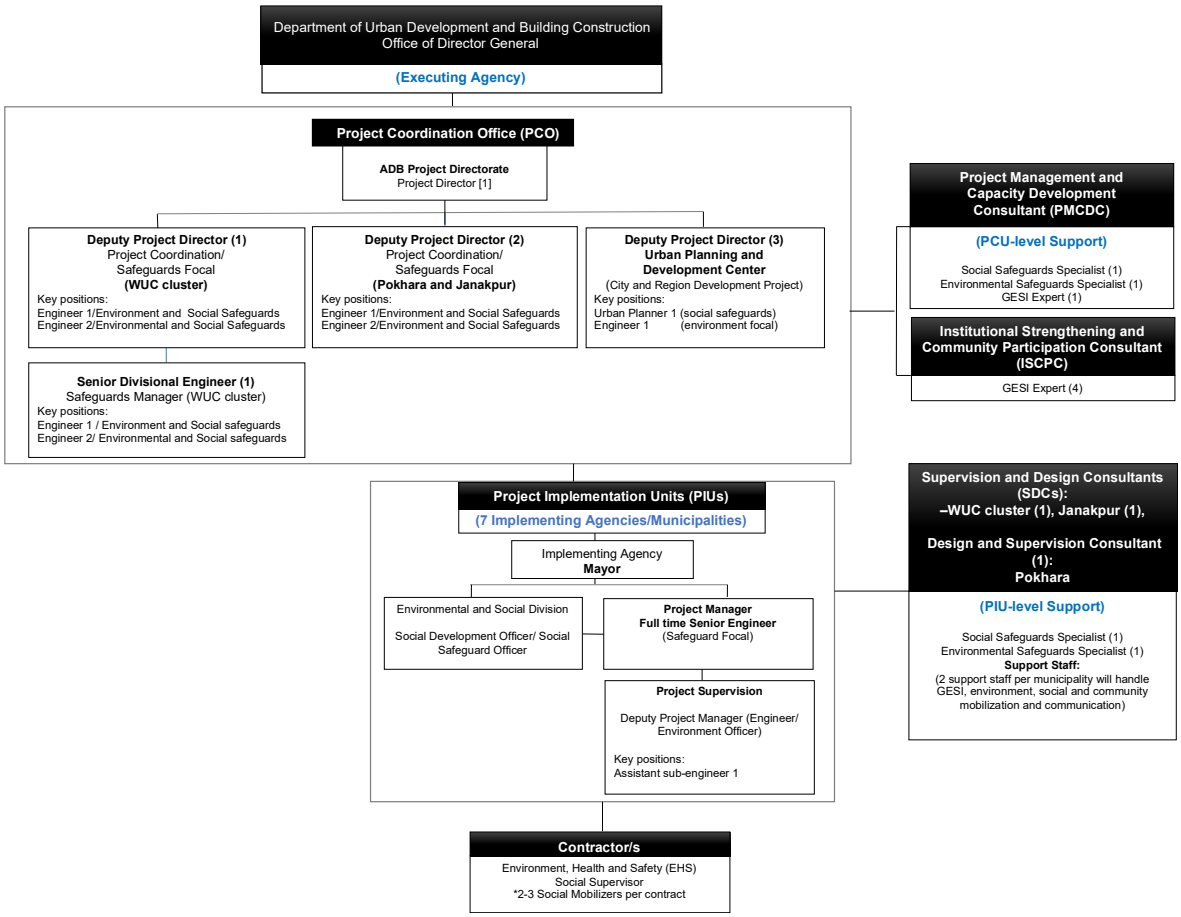


Table 4: Environmental Safeguards Roles and Responsibilities

PCO
- Ensure subprojects comply with the national and local statutory environmental requirements, ADB SPS 2009, EARF and environmental safeguards provisions of the ADB loan covenants - Ensure subprojects conform to exclusion criteria and subproject selection guidelines of EARF - Review and approve IEE reports, including EMPs, and ensure IEEs are updated based on final detailed designs and submit to ADB for review, clearance, and disclosure prior to bid invitation - Ensure that robust chance-find protocol is put in place and implemented properly - Ensure that updated/final IEEs based on final detailed design are provided to the construction contractor prior to start of construction - Ensure that the IEEs including EMPs are updated in case of changes in detailed design that may occur during implementation phase, and submitted to ADB for review, clearance and disclosure - Ensure that IEEs with EMPs are included in bidding documents and civil works contracts - Establish a system to monitor environmental safeguards of the Project including monitoring the indicators set out in the monitoring plan of the IEE - Ensure compliance with all national and local government rules and regulations regarding site and environmental permits/clearances/approvals as well as any other environmental requirements - Review, monitor and evaluate effectiveness with which the EMP, SEMP, and Health and Safety Plans are implemented, and recommend necessary corrective actions to be taken - Submit semi-annual environmental monitoring reports (SEMRs) to ADB - Ensure availability of budget for safeguards activities

- Ensure adequate awareness campaigns, information disclosure among affected communities and timely disclosure of final IEEs/EMPs and SEMRs, including corrective action plans, if any, in project website and in a form accessible to the public
- Address any grievances brought through the GRM in a timely manner
- Undertake regular review of safeguards-related loan covenants, and ensure compliance
- Organize capacity building and training programs to stakeholders, PIUs and contractors.

PIU

- Ensure subprojects comply with the national and local statutory and legal environmental requirements, ADB SPS 2009, EARF and safeguards related ADB loan covenants
- Ensure subprojects location and design confirms with exclusion criteria and subproject selection guidelines as stipulated in this EARF; closely work with design teams to ensure compliance
- Review subproject IEE reports, including EMPs, and ensure that subproject IEEs and EMPs are updated based on final detailed designs and submit to ADB for review, clearance, and disclosure prior to bid invitation
- With support from SDC, review and approve SEMPs prepared by contractor
- Conduct regular site visits, including spot checks, to ensure the proper implementation of EMP
- Review monthly reports from contractor
- Prepare Quarterly Reports on all aspects concerning environmental assessment, management, and monitoring obtain approval from PIU and submit approved reports to the PCO
- Address any grievances brought about through the GRM in a timely manner
- Support in all environmental safeguards activities and tasks of the PCO as may be needed

PMCDC

- Support PCO and PIUs in selecting the output 2 components in compliance with subproject selection criteria; ensure that no components falling under exclusion criteria are considered
- Screen and categorize output 2 subprojects based on this EARF
- Guide PIUs / prepare IEEs including EMPs based ADB SPS and national laws
- Support PCO/PIU in obtaining clearances and permissions per GON regulations
- Update/Finalize the IEE report including EMP based on final detailed design of the subproject
- Conduct due diligence of associated facilities and/or audit of existing facilities part of IEE
- Conduct of meaningful consultations and ensure issues/concerns/suggestions raised are incorporated in the design and updated/final IEE report
- Ensure relevant provisions of the IEE and EMP are incorporated in the bid and contract documents
- Establish grievance redressal mechanism and ensure members of the grievance committee have the necessary capacity to resolve project-related issues/concerns
- Conduct safeguards capacity building to ensure PCO and PIU have the capacity to implement, monitor, and report on implementation of environmental safeguards, including EMP
- Oversee implementation of EMP at work sites, including all potential safeguard issues identified in the safeguard documentation mentioned above
- Ensure that any unanticipated environmental risks or impacts that arise during construction, implementation or operation are identified and corrective actions are implemented and reported
- Undertake other relevant tasks to ensure the subproject complies with ADB SPS and national environmental laws, rules, and regulations

SDC

- Work closely with technical teams, and assist PIUs in selecting the output 2 components in compliance with subproject selection criteria
- Prepare categorization checklists and assist in categorization of the output 2 components
- Update IEE report as required in accordance with ADB SPS and national laws
- Conduct due diligence of associated facilities and/or audit of existing facilities, if any, during the detailed design phase, as defined in ADB SPS
- Review and approve contractor's site-specific construction EMP (SEMP)
- Monitor implementation of EMP at all work sites, including all potential safeguard issues identified in the safeguard documentation mentioned above
- Monitor any unanticipated environmental risks or impacts that arise during construction, implementation or operation of the subproject that were not considered in the IEE report and EMP. Prepare corrective action plans and ensure that these are implemented by the contractor and reported accordingly in environmental monitoring reports to ADB
- take proactive action to anticipate and avoid delays in implementation
- under the guidance of PMCDC, develop system of indicators to monitor implementation of the EMP and ensure corrective actions are undertaken, if and as required

- obtain environmental safeguard related information with the help of field support staff and consolidate them; prepare periodic environmental safeguard monitoring reports - compile all monitoring inputs at PIU level for quarterly progress reports - assist PIUs in conducting public consultation and disclosure activities related to social safeguards - actively participate, assist in resolving all grievance redress activities; and support ISCPC in all training and capacity building activities
Contractor
- Appoint full-time on-site EHS supervisor - Prepare SEMP including site-specific occupational health and safety plan and submit to AUIDFCL for approval prior to start of construction; no works can commence until SEMP approved - Carry out all environmental mitigation and monitoring measures outlined in EMP and SEMP - Supervise work site safety, and provision of PPEs etc., - Ensure implementation of SEMP and report to PIU/SDC on any new or unanticipated impacts and implement mitigation measures as required - Obtain permissions, consents, licenses etc., as necessary, always ensure regulatory compliance - Conduct environmental monitoring (air, noise, etc.,) as per the monitoring plan - Conduct trainings[1], orientation and daily briefing sessions (toolbox talks) to workers on environment, health and safety - Undertake health and safety risk assessment (occupational and community health and safety) and prepare an implement site specific health and safety plan; following good international practices consistent with IFC EHS guidelines - Ensure that appropriate worker facilities are provided at the workplace and labor camps as per the contractual provisions; following IFC worker accommodation standards2 - Enforce all workers to comply with the OHS requirements of the EMP including the wearing of appropriate PPE on the construction site. - Carry out site inspections on a regular basis using proper formats and checklists - Record EHS incidents and undertake remedial actions - Prepare monthly EMP implementation and monitoring reports and submit to PIU/PMSC - Work closely with PIU and PMSC to ensure communities are aware of project-related impacts, mitigation measures, and GRM - Address public complaints and grievances promptly, and coordinate with the PIU and PMSC and ensure that these are addressed in an effective and timely manner - Establish and operate a system to receive and redress grievances/compliance from project workers and other personnel (including anonymous complaints); report promptly to PMU and PMSC on any complaints and action taken - Comply with labour legislations, and ensure that subcontractors also implement labor legislations requirements, through cascading of requirements to subcontractors — human resource policy, labor management requirements, any worksite specific grievance redress mechanism - Institute an emergency plan for natural calamities/disasters and accidents at the site

[1] Some of the key areas that may be covered during training as they relate to the primary causes of accidents include (i) slips, trips and falls; (ii) personal protective equipment; (iii) ergonomics, repetitive motion, and manual handling; (iv) workplace transport; and (v) legislation and responsibilities. Training can provide the foundations of competence, but it does not necessarily result in a competent worker. Therefore, it is essential to assess staff competence and monitor to ensure that the training provided is relevant and effective.

[2] https://www.ifc.org/content/dam/ifc/doc/mgrt/workers-accomodation.pdf

Table 5: Environmental Management Plan Matrix for Devdaha (Construction Phase)

Parameter	Environmental Impacts	Mitigation Measures	Institutional Responsibility	
			Implementation	Monitoring/ Supervision
Pre-Construction Phase				
Consents, permits and clearances	Failure to obtain necessary consents, permits, and clearances can result in design revisions and/or stoppage of the Works.	• All necessary local clearances and no objection certificates will be obtained prior to award of contract. • Coordination with all the concerned agencies before finalizing design to avoid damage to existing utilities. • Environmental clearance will be obtained prior to award of contract.	PCO, PIU, PMCDC	DUDBC
Integration of EMP in bidding documents and contracts	Lack of awareness by contractors on ADB SPS requirements may result in insufficient budget and non-implementation of EMP	• The PCO will incorporate the costs of implementing OHS and the EMP as well as specific provisions requiring contractors to comply with all other conditions required by ADB into the bidding and contract document. • Once the Contractor is selected, the PCO/PIU with support from PMCDC will inform contractors of their responsibilities in EMP implementation, in compliance with ADB and government requirements, self -monitoring and reporting procedures.	PCO, PMCDC	DUDBC
EMP Implementation Training	If the contractors and construction supervision engineers are not aware about the requirements of this EMP, the project may not proceed and comply with ADB and GoN environmental policies.	• The PCO, PIU and contractors will be required to undergo training on EMP implementation.	PCO, PIU, PMCDC	DUDBC
Updating of IEE	IEE and EMP out of date due to changing conditions or design	• The PCO shall update the IEE in case of change in design/based on the final detailed design and submit the same for review and clearance of ADB.	PCO, PMCDC	DUDBC

Parameter	Environmental Impacts	Mitigation Measures	Institutional Responsibility	
			Implementation	Monitoring/ Supervision
Community Awareness on Project Activities and Impacts	Lack of community awareness on project activities may result in potential community health and safety concerns and complaints.	• Before the start of project construction, a meaningful consultation with the affected communities will be conducted. This meaningful consultation will aim to engage community stakeholders, listen to their views, and try to come to a common understanding about the need for an improved drainage system and the sacrifices that need to be made to achieve it. To aid in the consultation process, it is important that the community should be made aware of the details of project activities. Important information to be disseminated to the people are, among others, the following: • Overview and objectives of the proposed project; • Preliminary and/or final detailed design of proposed project components; • Potential environmental and social impacts (positive and negative) of the project, and the proposed mitigation measures for the perceived negative impacts; and • Grievance redress mechanism and contact details of the project.	PIU, Contractor	PCO, PMCDC
Construction materials	Impacts due to mining and borrow areas	• Reuse the excavated soils and road material as much as possible in the construction and raising ground, and minimize the need for new material. The municipality /PIU to coordinated with other construction works/projects in the respective areas to source the excess soil. • If new material is needed, use only the existing material sources and borrow areas permitted by government (DMG) • Avoid creation of new borrow areas as much as possible, in unavoidable cases, obtain all permissions and clearances, including conduct of environmental assessment studies and obtaining environmental clearances • Ensure that borrow areas are not located in environmentally sensitive areas; conduct baseline assessment prior to selecting a site • Prepare borrow area management plan and implement • Verify suitability of all material sources and obtain approval of PIU; • Ensure that the loading and unloading of the materials and the transportation of the materials from source to construction site	PIU, Contractor	PCO, PMCDC

Parameter	Environmental Impacts	Mitigation Measures	Institutional Responsibility	
			Implementation	Monitoring/ Supervision
		does not cause impact on health and safety of the workers and the community; and • Submit to PIU on a monthly basis documentation of sources of materials. If contractor is purchasing ready mix concrete, asphalt/macadam and aggregates from third party, contractor will ensure that all the parties/ suppliers necessary clearances and permission as per the Nepal law and will provide the documentary evidence to PIU/consultants.		
	Impact due to stockpiling of construction materials and disposal of spoil.	• Control dust by spraying water. • Manage spoil through reuse and proper disposal. • Aware and motivate workers to reduce pollution. • Cover and secure loose stockpiles for future rehabilitation by employing suitable bioengineering techniques for stabilization and covering. • Incorporate measures and sites for handling excessive spoil material. • Incorporate drainage plan in final design.	Contractor	PIU, SDC, PMCDC
Construction phase				
Construction Planning	Inadequate planning could lead to non-implementation of EMP during the construction phase and result in significant environmental impacts leading to non-compliance with ADB's environmental safeguard requirements.	• Appoint an Environmental Health and Safety (EHS) Supervisor; • Develop a Site-Specific Environmental Management Plan (SEMP) and get it approved from the Client; • Conduct training on the rationale for and implementation of the SEMP and EMP to enhance general understanding and clarify responsibilities regarding implementation, including monitoring and reporting, must also be provided to relevant staff of contractors; • While the locations of all project components have been finalized, the locations of labour campsites, batching plant site etc. have not been finalized. The Contractor should select the locations in consultation with local municipalities and get the approval of PCO and PIU. All necessary infrastructure should be provided at the facility for effectively operating the infrastructure during the construction period; • The Contractor will be required to submit to PCO, for review and approval, a SEMP including (a) proposed sites/locations for	Contractor	SDC, PIU, PMCDC, PCO

Parameter	Environmental Impacts	Mitigation Measures	Institutional Responsibility	
			Implementation	Monitoring/ Supervision
		construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous wastes, (b) specific mitigation measures following the approved EMP; (c) monitoring program as per EMP; and (d) budget for SEMP implementation. No works can commence prior to approval of SEMP. The SEMP will include the following: (i) Construction Compound Management Plan; (ii) Construction Health and Safety Plan (including COVID-19 H&S guidance); and (iii) Emergency Incident Response Plan.		
Disruption of Existing Utilities	Disruption of infrastructure and services	• conduct investigation at site to determine all the existing utilities that will likely be disturbed during construction phase; • all underground utilities should be marked prior to any construction works to be taken up at the locations; and • coordinate with agencies responsible for the maintenance of the utilities and formulate a plan to minimize disruption of services during construction phase. The plan must be formulated in coordination with PCO and stakeholders at the site. Where required, the responsible agency shall be requested by PIU to carry out the necessary works at the time required and at cost of the subproject.	Contractor	PCO, PMCDC
Excavation Works	Excavations may affect local drainage patterns if surface and groundwater collect in voids as they are being dug.	• All excavations shall be done to the minimum dimension as required for safety and working facility. • Excavations should be carried out after identifying the location of all utilities that exist along the project area; • The excavation shall be executed in such manner, that the contractor does not damage or interfere with existing services or structures. If damage or interference is so caused, the contractor shall decide with the supply and/or building owner to execute the repairs at the contractor's own cost. • Explore working on off-peak hours or night on busy road sections with prior permission and proper lighting and safety measures, however, no noisy works shall be conducted during night; • Road drains and channels shall be kept free from obstructions at all times.	Contractor	SDC, PIU, PMCDC, PCO

Parameter	Environmental Impacts	Mitigation Measures	Institutional Responsibility	
			Implementation	Monitoring/ Supervision
		• Excavated areas should be sufficiently demarcated so as not to affect the health and safety of workers and the people using the road alignment for their daily activities.		
Tree Conservation	There are 53 trees belonging to various species along road alignment which may be affected by the road construction/ improvement. Out of these 40 trees may be impacted by the project activities.	• The first priority is to avoid cutting of trees through changes in design and road alignments. This is in particular important when the tree species is protected or considered sacred by the community and / or houses nests for birds; • Do not cut trees such as Simal (*Bombax cieba*) and Peepal (*Ficus religiosa*) retain the tree / alter the alignment / layout of road / drain locally to preserve the trees; • after the finalization of the designs and layout of the project components, the trees within proposed construction areas will be marked; • trees within area required for construction will be felled after prior approval; • replacement of the tree shall be undertaken by project office PIU at the replacement ratio of ten trees for every tree that is cut (i.e., 1:10 ratio) Indigenous/native species will be preferred in tree planting; • only trees that will require removal within the proposed construction areas of the sites will be cut; and • For trees that will not be cut, take all precautions to protect them from any damage from construction activities. • Conduct survey of trees for bird nests prior to cutting, if any active nests, ensure that trees are not disturbed until young birds fly away from the nests, do not cut trees during the breeding season; • Prevent workers from removing / damaging any other flora and fauna found in the project vicinity; and • Prohibit employers and workers from poaching animals and cutting of trees for firewood in the vicinity of the construction site.	Contractor	SDC, PIU, PMCDC, PCO
Excavated Earth Management	Excavation during construction will generate loose soil which can be carried	• The Contractor shall plan his works to minimize surface excavation works during the rainy season where practicable. • Precautions to be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or	Contractor	SDC, PIU, PMCDC, PCO

Parameter	Environmental Impacts	Mitigation Measures	Institutional Responsibility	
			Implementation	Monitoring/ Supervision
	through surface run-off during a rainfall.	forecast, and actions to be taken during or after rainstorms shall be developed by the Contractor. • The earthwork sites where exposed land surface is vulnerable to runoff shall be consolidated and/or covered. • Channels, earth bunds, netting, tarpaulin and or sandbag barriers shall be used on site to manage surface water runoff and minimize erosion. • The overall slope of the works areas and construction yards shall be kept to a minimum to reduce the erosive potential of surface water flows. • Monitor groundwater quality that could exist close to the working areas to ensure compliance.		
Impact on Surface Water Quality	Silt-laden run-off from stockpiled materials, solid wastes and domestic wastewater from the construction camp, and leaks from chemical storage areas and machineries may contaminate or result in water pollution if disposed or discharged to nearby receiving bodies of water.	• Provision of temporary sedimentation canal and/or silt traps along construction areas, particularly alignments that are adjacent to receiving bodies of water or canals • The measures to address soil erosion at the proposed facilities will consist of measures as per design, or as directed by the PMCDC to control soil erosion, sedimentation, and water pollution. All temporary sedimentation, pollution control works, and maintenance thereof will be deemed incidental to the earthwork or other items of work. • All temporary discharge points shall be located, designed and constructed in a manner that will minimize erosion in the receiving channels. • Ensure proper compaction of refilled soil and there shall not be any loose soil particles on the top; the material shall be refilled in layers and compacted properly layer by layer. • Use surplus soil for beneficial purposes such as in any other construction activities, or to raise the level of low-lying areas. • Avoid scheduling of excavation work during the monsoon season. • Confine construction area including the material storage (sand and aggregate) so that runoff will not enter the site. • Ensure that drains are not blocked with excavated soil • Stockyards at least 50 meters (m) away from watercourses.	Contractor	SDC, PIU, PMCDC, PCO

Parameter	Environmental Impacts	Mitigation Measures	Institutional Responsibility	
			Implementation	Monitoring/ Supervision
		• Fuel and other petroleum products stored at storage areas away from water drainage and protected by impermeable lining and bunded110%. • Effective maintenance of machinery and vehicles to avoid leakages; • For effluents from workplace, camps, and offices, provide treatment arrangements such as retention ponds and septic tanks which should be incorporated in the facility designs. A sewage management plan has to be prepared by the contractor and agreed with the PMCDC. • Solid Waste Management, as detailed in the SEMP, should be implemented throughout the construction period; • Monitor water quality according to the environmental monitoring plan.		
Impact on Groundwater	Increased groundwater demand for construction and consumption use can deplete the Groundwater Table; Unscientific Solid Waste and Construction Waste Disposal can lead to contamination of ground water,	• Use groundwater resources judiciously and as per the approved Groundwater Management Plan defined in the SEMP; • All tube wells, test holes, monitoring wells that are no longer in use or needed shall be properly decommissioned; • Storage of lubricants and fuel at least 50m from water bodies and in double-hulled tanks; • Effective maintenance of machinery and vehicles to avoid leakages; • Effective management of solid waste and construction debris as per an approved SEMP; • Provide uncontaminated water for dust suppression; • Monitor Groundwater Quality according to the Environmental Monitoring Plan.	Contractor	SDC, PIU, PMCDC, PCO

Parameter	Environmental Impacts	Mitigation Measures	Institutional Responsibility	
			Implementation	Monitoring/ Supervision
Drainage Management	Construction material getting into surface run off or uncontrolled disposal may cause drainage congestion, flooding or waterlogging in neighboring areas.	• The contractor shall adopt a site clearance procedure that separates topsoil and stores it under appropriate conditions for reuse as instructed by the Engineer. • Wastes and construction debris will not be disposed in a manner that these would end up in drainage canals. • The on-site storage of excessive quantities of unwanted spoil and aggregate materials should be avoided. Where storage is necessary, the Contractor shall ensure heaps and stockpiles are located at sites that they do not permit direct runoff into watercourses and are on land sloping at less than 1.5%. • All heaps shall be of a size and stability that will ensure the risk of mass movement during period of heavy rainfall is minimized.	Contractor	SDC, PIU, PMCDC, PCO
Impact on Air Quality	Construction activities including transport and storage of raw materials will likely create dust and emissions that could deteriorate ambient air quality in the area.	• Take every precaution to reduce the levels of dust at construction sites, and not exceeding the pre-project ambient air quality standards. • Fit all heavy equipment and machinery with air pollution control devices that are operating correctly. • Construction vehicles must travel at speeds that minimizes dust generation; • Reduce dust by spraying water stockpiled soil, excavated materials, and spoils. • Cover with tarpaulin vehicles transporting soil and sand. • Cover stockpiled construction materials with tarpaulin or plastic sheets. • Water spraying to access roads, camp sites and work sites to reduce dust emissions. • Machines and vehicles must be regularly examined and maintained to comply with requirements of technical specifications. • All vehicles, equipment, and machinery used for construction will be regularly maintained to ensure that pollution emission levels comply with the relevant standards; • Repair and maintain access roads, as necessary.	Contractor	SDC, PIU, PMCDC, PCO

Parameter	Environmental Impacts	Mitigation Measures	Institutional Responsibility	
			Implementation	Monitoring/ Supervision
		• prohibit burning firewood in work and labor camps (promote liquified petroleum gas for cooking purposes and electric heater for heating purposes; • use vehicles that have government-issued permits and registrations; and • prohibit open burning of solid waste. • Monitor air quality according to the environmental monitoring plan.		
Impact on Noise	Noise generation may disturb nearby sensitive receptors	• Arrive at the construction schedule upon discussion with nearby stakeholders, especially when works are carried out near sensitive receptors such as hospitals, schools, places of worship etc. • Install noise barriers between the source and receptor, as necessary; • Enclose and locate generators away from sensitive receptors; • Start machines and vehicles sequentially rather than all together; • spread out the schedule of material, spoil and waste transport; • minimize drop heights when loading and unloading coarse aggregates; • avoid use of horns unless absolutely necessary; • Select electrically powered plant that is quieter than diesel or petrol-driven plant, if interchangeable; • Use modern vehicles and machinery with standard adaptations to reduce noise and exhaust emissions, and ensure they are maintained to manufacturers' specifications; • Noise-generating equipment must be fitted with silencers. • Optimize the use of noisy construction equipment and turn off any equipment if not in use; • Regular maintenance of all equipment and vehicles; • Stop all construction activities during night; • Implement a complaint handling system;	Contractor	SDC, PIU, PMCDC, PCO

Parameter	Environmental Impacts	Mitigation Measures	Institutional Responsibility	
			Implementation	Monitoring/ Supervision
		• Workers should be provided with earmuffs/protective hearing equipment in noise critical areas • Place visually clear instructions in areas where noise emissions are significant. • Measure noise level according to the environmental monitoring plan.		
Construction Waste Management	Inadequate management of construction wastes will result in negative impact on the soil, aesthetic beauty of area and workers' health and safety.	• Develop and seek approval for the Construction Waste management Plan as part of the SEMP; • Identify and seek approval for the areas where the construction waste could be disposed; • The contractors should take every opportunity to reduce the amounts of waste generated and collect recyclable material for processing by local operators. • Contractor shall implement waste segregation on site. • Receptacles for solid waste should be provided for the use of workers, and their contents should be disposed properly; . • Construction waste should also be disposed of in legal local landfills • Clean construction waste such as excess soil or rubble should be used in landscaping on site or given to landowners and developers seeking fill material. • Waste auditing. The contractor will record the quantity in tons and types of waste and materials leaving site during the construction phase; • Waste fuels/oils may be generated from equipment used on-site during construction and may be classified as hazardous waste. Such wastes will be stored in a secure, bunded area on-site prior to collection by relevant parties; • Practice waste segregation. • Adoption of 5R principle (i.e. Refuse, Reduce, Reuse, Repurpose and Recycle). • Strictly prohibit open burning of waste. • Prohibit use of plastic materials to minimize the quantity of plastic waste.	Contractor	SDC, PIU, PMCDC, PCO

Parameter	Environmental Impacts	Mitigation Measures	Institutional Responsibility	
			Implementation	Monitoring/ Supervision
		• Establish a temporary yet effective drainage system to ensure the proper disposal of wastewater generated during the cooking activities adopted by the workers.		
Impact on Aquatic Ecology	Siltation, chemical spills, improper waste disposal may affect the water quality of nearby canals, ponds/river, and any thriving aquatic species.	• Provide temporary protection at sections near the river/ponds to avoid sliding of soils; • Store spoils away from the side of the river/pond; • Implement proper storage/disposal of materials, chemicals and waste • Implement mitigation measures for excavation, soil erosion and sediment mobilization, surface water pollution, and construction waste generation; and • Conduct sampling and analysis of surface water near to the construction sites as part of the Environmental Monitoring Plan.	Contractor	SDC, PIU, PMCDC, PCO
Impact to Traffic and Access	Road rehabilitation works will render some portions of the road unusable at periods of time resulting in traffic congestion and inconveniences to pedestrians and motorists in the vicinity of the affected area.	• Plan roads and drain works minimizing traffic disturbance/blockades; work planning is crucial to minimize the inconvenience to public due to road works; provide diversions / alternative roads where required • Schedule road works close to the Lumbini heritage area in consultation with WHS, museum authorities, tourist agencies and traffic police; works that may affect the tourist places shall not be conducted during the tourist season • A Site-Specific Traffic Management Plan should be drawn up in consultation with the local community on construction operations and work schedules.; • Coordinate with traffic police for temporary road diversions and for provision of traffic aids; • Notify public and provide sign boards informing nature and duration of construction works and contact numbers for concerns/complaints; • Maintain sufficient access to houses and shopkeepers (commercial establishments) during works; provide proper and safe pedestrian access.	Contractor	SDC, PIU, PMCDC, PCO

Parameter	Environmental Impacts	Mitigation Measures	Institutional Responsibility	
			Implementation	Monitoring/ Supervision
		• Awareness should be built amongst the community on the implementation of the Site-Specific Traffic Management Plan; • Emergency response plan must be prepared for any traffic accident during construction and should be included in the SEMP. • As necessary, increase workforce for speedy completion; • Schedule material deliveries on low pedestrian traffic hours; • Restore damaged properties and utilities; • Erect and maintain barricades if required; • Pedestrian access will be maintained with the use of walking boards. Wheelchair and disabled access shall be maintained. • Surfaced roads shall be subject to road cleaning and unsurfaced roads to dust suppression, the methodology and frequency of which shall be included in the SEMP.		
Impact on Socio-Cultural Resources, Tourism and Chance Finds	There might be chances of finding items of archeological importance are high in the town.	• Prior to commencement of construction, consult with concerned religious authorities of these temples, nearby people and devotees and explain the work method and duration of proposed works, take their suggestions and comments in scheduling and conducting the works • Put in place proper dust and noise control measures • Adjacent to religious/social/historical buildings, undertake excavation and construction work in such a way that no structural damage is caused to the structures • Schedule and plan work considering the tourist season and tourist areas • Observe the local rituals and important dates of festivals, weekly/monthly/annual religious occasions in the religious places and do not make any disturbance/hindrance/obstacles during such time to the religious places • Provide proper signage, barricades etc. to protect public and devotees from dangers of construction works. • Ensure proper traffic management planning to minimize the disruption to the normal traffic flow in the area and ensure the safety of the people. • Clear the work site of unnecessary material, equipment, and debris / surplus soil; do not stock material / soil at the sites	Contractor	SDC, PIU, PMCDC, PCO

Parameter	Environmental Impacts	Mitigation Measures	Institutional Responsibility	
			Implementation	Monitoring/ Supervision
		• Conduct continuous consultations with the local people during the works • Strictly follow the protocol by coordinating immediately with PIU and Nepal Department of Archaeology for any suspicion of chance finds during excavation works; • Create awareness among the workers, supervisors and engineers about the chance finds during excavation work; • Stop work immediately to allow further investigation if any finds are suspected; and • Inform the Nepal Department of Archaeology (NDA) if a find is suspected and take any action they require to ensure its removal or protection in situ • Follow the written instructions of DOA for continuation of works.		
Impact on socio-economic activities	Disturbance to economic activities may result from excavation works, stockpiling, the operation of construction vehicles and equipment, and accidental damage to utilities	• Develop the construction schedule in discussions with the community so that movement of construction vehicles can be avoided during school timings, festival times and / or any other local events that would require local communities to travel; • Implement Traffic Management Plan in collaboration with local authorities; • Where traffic congestion will likely occur, place traffic flagmen during working hours; • Avoid full road closures by applying the construction method on section-wise and/or chainage-wise approach during excavation, concreting and/or curing periods; • If full road closure is not possible, especially on very narrow roads, ensure that alternate routes are identified and that affected residents and establishments are informed prior to conducting the construction activities; • Provide convenient access to pedestrians when works occur in front of residential, commercial or institutional establishments. Examples are planks with handrails that should be provided to cross excavated areas. • Provide appropriate compensation to qualified affected people or businesses per approved resettlement plan for the subproject; • Manage stockpile;	Contractor	SDC, PIU, PMCDC, PCO

Parameter	Environmental Impacts	Mitigation Measures	Institutional Responsibility	
			Implementation	Monitoring/ Supervision
		• Manage pumped water from excavations either to drains or drums for later use; • Relocate the affected power supply poles, and • Advise the concerned authority during accidental damage to utilities.		
Occupational Health and Safety	Construction activities could create health and safety risks to construction workers	• All relevant provisions of the National Health Care Waste Management Standards and Operating Procedure-2020 and relevant WHO guidelines will be adhered to, concerning the provision of adequate measures to avoid contracting and/or spreading diseases during construction phase; • Follow international best practices on occupational health and safety such as those in Section 4.2 of World Bank EHS Guidelines on Construction and Decommissioning Activities; and EHS Guidelines on Waste Management Facilities. These practices include recommended measures to prevent, minimize and control pathogens from inflicting workers through training and use of appropriate PPEs, clothing and equipment when working along the drainage system, and immunization and health monitoring (e.g. hepatitis B and tetanus). • Existing drains may present hazardous working conditions in some places due to lack of oxygen and flammable nature of methane emissions which will be detrimental to the health and safety of workers. Put in place standard operating procedures with appropriate equipment, and workers are provided with necessary training and personnel protection equipment to safeguard health and safety • Follow established occupational health and safety protocol on emerging infectious diseases such as the corona virus disease (COVID19). • A readily available first aid unit, including an adequate supply of sterilized dressing material and appliances, will be provided as per the factory rules. Suitable transport will be provided to facilitate the transfer of injured or ill persons to the nearest hospital;	Contractor	SDC, PIU, PMCDC, PCO

Parameter	Environmental Impacts	Mitigation Measures	Institutional Responsibility	
			Implementation	Monitoring/ Supervision
		• Other first aid medical equipment and nursing staff will be made available or arranged on-call; • The contractor will, at his own expense, conform to all disease prevention instructions as may be given by PCO/PIU; • Provide regular health check-ups, sanitation and hygiene, health care, and control of epidemic diseases to the workforce; • The contractor shall provide at cost all labor and materials and construct/install and maintain site safety, hard barricading, flexible green net, signboards, temporary day/light traffic diversions throughout the construction activities according to the specifications and provide personal protective equipment (PPE) to all the laborers working at the construction site; • Launch awareness programs concerning human trafficking and the possibility of spread of sexually transmitted diseases (STDs) and HIV/AIDS using brochures, posters, and signboards; • Make available first aid kits, ambulance facilities, and fire extinguishers in camp sites, if any; • Compensation for the loss of life (a zero tolerance to loss of life policy should be developed and implemented) or for any type of injuries; and • Provide adequate insurance to the workers that is current throughout the construction period; • Conduct Health and Safety Training periodically and Daily Tool Box Training for all site personnel.		
Community Health and Safety	Construction activities could create health and safety risks to community people.	• Code of conduct for workers should be developed and implemented throughout the construction period; • Follow International best practices on community health and safety such as those in Section 4.3 of World Bank Environmental Health and Safety (EHS) Guidelines on Construction and Decommissioning Activities; • Follow established community health and safety protocol on emerging infectious diseases such as COVID19. • Implement measure to prevent proliferation of vectors of diseases at work site;	Contractor	SDC, PIU, PMCDC, PCO

Parameter	Environmental Impacts	Mitigation Measures	Institutional Responsibility	
			Implementation	Monitoring/ Supervision
		• Maintain a complaint logbook in worker's camp and take action promptly of complaints. Follow the established GRM of the overall project (URLIP); • Schedule transportation activities by avoiding peak traffic periods; • Clean wheels and undercarriage of haul trucks prior to leaving construction site; • Educate drivers: limit speed not more than 30 km/h in settlements and avoid use of horn; • Earmark parking place for construction equipment and vehicles when idling; no parking shall be allowed on the roads, that may disturb the traffic movement; • Provide prior information to local community, temples and other places of worship about work schedules; • Noise barriers must be installed in between the construction site and any community locations to reduce the noise level; • • Provide adequate space and lighting, temporary fences, reflectorized barriers and signages at the work site; and • Ensure contractor has staff trained on emergency response.		
Post-construction clean-up and reinstatement	Construction debris, spoils, and excess construction materials may pose hazards to properties, community and environment if left unattended after construction.	• The contractor will reinstate all working areas and access routes as work proceeds during construction. All plant, equipment, materials, temporary infrastructure and vehicles will be removed at the earliest opportunity and the surface of the ground restored as near as practicable to its original condition. The following generic measures should be taken: • Remove all spoils wreckage, rubbish, or temporary structures (such as buildings, shelters, and latrines) which are no longer required; • All excavated roads shall be reinstated to original condition; • All disrupted utilities restored; • All affected structures rehabilitated/compensated; • The area that previously housed the construction camp is to be checked for spills of substances such as oil, paint, etc. and these shall be cleaned up;	Contractor	SDC, PIU, PMCDC, PCO

Parameter	Environmental Impacts	Mitigation Measures	Institutional Responsibility	
			Implementation	Monitoring/ Supervision
		• All hardened surfaces within the construction camp area shall be ripped; • All imported materials removed, and the area shall be top soiled and regressed using guidelines set out in the re-vegetation specification that forms part of this document; • The contractor must arrange the cancellation of all temporary services; • Request PIU to report in writing that worksites and camps have been vacated and restored to pre-project conditions before acceptance of work.		

Table 5: Environmental Management Plan for Devdaha– (Operational Phase)

Parameter	Environmental Impacts	Mitigation Measures	Institutional Responsibility	
			Implementation	Monitoring / Supervision
Routine Maintenance	Traffic may be interrupted temporarily but this work will be very small in scale, periodic, and short in duration, so there will be no economic or other implications. Also, the environmental impacts will be much less than those during the construction period.	• To maintain the safety of workers and road-users, such work should be coordinated with the local police department so that adequate warning signs and traffic diversions can be set up when necessary • Debris need to be collected and disposed at a designated site such as the landfill. • Continue to encourage community participation in ensuring drainage canals are clog-free through information and behavior change campaigns and incentives, if possible.	Municipality/PIU	PCO, DUDBC
Community Safety	Improved roads may give way to faster vehicle speeds which could	• Conduct regular inspection of the roads to check for damages, and undertake rehabilitation measures for any damages found;	Municipality/PIU	PCO, DUDBC

	endanger people and households along the road alignments. Damage in roads may also cause accidents to motorists.	• Inspect and maintain the integrity of road barriers, especially at critical curves or locations that are prone to vehicular accidents; • Inspect and maintain speed limiters such as humps installed on road sections near residential areas, schools, and religious establishments; • Inspect and maintain all road signages, including appropriate warning signages at silent zones, and ensure that these are reflectorized and visible even during night time; and • Ensure pedestrian crossings are maintained.		

E. Environmental Monitoring Plan

10. Monitoring of mitigation measures during construction is the responsibility of the PIU and PCO, supported by the PMCDC Environmental Specialist. However, monitoring of mitigation measures during operation phase is the responsibility of the Asset Owner. Table 6 and 7 shows the proposed Environmental Monitoring Program for this subproject, which specifies the various monitoring activities, indicating location, frequency of monitoring and responsibility.

Table 5: Environmental Monitoring Program

Activities or Items to Monitor	Location	Responsible for Activities	Monitoring Method	Monitoring Frequency	Monitoring Responsibility
PRE-CONSTRUCTION					
Secure Environmental Clearance Certificate (ECC) from MoUD	PCO office	PCO, PMCDC	Copy of approved ECC	Before construction activities	PCO, PMCDC
IEEs and EMPs are included in bid and contract documents	PCO office	PCO, PMCDC	Copies of bid and contract documents	Before approval tender document	PCO, PMCDC
Site-specific EMP (SEMP) submitted by Contractor for approval by PIU	PIU office	Contractor, PIU	Copy of approved SEMP	Before construction activities commence	PCO, PMCDC
Spoil management plan (SMP) submitted by Contractor for approval by PIU	PIU office	Contractor, PIU	Copy of approved SMP	Before construction activities commence	PCO, PMCDC
Traffic management plan (TMP) submitted by Contractor for approval by PIU	PIU office	Contractor	Copy of approved TMP	Before construction activities commence	PCO, PMCDC
Secure all other necessary permits and licenses from relevant government agencies		Contractor	Copies of permits and licenses	Before construction activities commence	PCO, PMCDC
Conduct of baseline ambient air quality and noise level monitoring	Devdaha site	Contractor	Site visits and observations, Contractor records, Results of Air Quality Sampling and Noise Level measurements.	Before construction activities commence	PCO, PIU, PMCDC
Conduct of baseline surface	Devdaha site	Contractor	Site visits and observations,	Before construction	PCO, PIU, PMCDC

Activities or Items to Monitor	Location	Responsible for Activities	Monitoring Method	Monitoring Frequency	Monitoring Responsibility
water and ground water quality monitoring			Contractor records, Results of laboratory analyses	activities commence	
CONSTRUCTION					
Implementation of SEMP; including implementation of community and occupational health and safety measures.	Devdaha site	Contractor	Site visits, Contractor records,	Weekly or as needed	PCO, PIU, PMCDC
Implementation of SMP	Devdaha site	Contractor	Site visits, Contractor records,	Weekly or as needed	PIU, PMCDC
Implementation of TMP	Devdaha site	Contractor	Site visits, Contractor records,	Weekly or as needed	PIU, PMCDC
Tree Removal and Replacement	Devdaha site and planting site	Contractor	Site visits, Contractor records,	Monthly, or as needed	PCO, PIU, PMCDC
Conduct of ambient air quality and noise level monitoring	Devdaha site	Contractor	Site visits and observations, Contractor records, Results of laboratory analyses, Results of noise level measurements	Quarterly or as needed	PCO, PIU, PMCDC
Conduct of surface water quality monitoring	Devdaha site	Contractor	Site visits and observations, Contractor records, Results of laboratory analyses	At least semi-annual or as needed	PCO, PIU, PMCDC
Develop and apply archaeological protocol to protect chance finds	Devdaha site	Contractor, PCO, PIU, PMCDC	Contractor records	Once until protocol is approved	PCO, PIU, PMCDC
Provide EHS training for all personnel	Devdaha site	Contractor	Contractor records; Interviews to workers	Monthly	PIU, PMCDC
Keep accident reports and records	Devdaha site	Contractor	Contractor records; Interviews to workers and community people	Monthly	PIU, PMCDC

Activities or Items to Monitor	Location	Responsible for Activities	Monitoring Method	Monitoring Frequency	Monitoring Responsibility
Employ workforce from communities near sites	Tillotama site	Contractor	Contractor records	Monthly	PIU, PMCDC
Implementation of EHS measures at construction camps	Construction camp site	Contractor	Site visits; Interviews to workers at camp	Monthly	PIU, PMCDC

Table 6 Environmental Monitoring Plan (Sampling & Analysis)

Monitoring field	Monitoring location	Monitoring parameters	Frequency	Responsibility	Cost & Source of Funds
Ambient air quality	6 locations – selected for each sampling program depending on the active construction sites at the time of the sampling program	PM10, PM2.5, NO2, SO2, CO	Once before start of construction and quarterly (yearly 4-times) during construction	Contractor	Cost for implementation of monitoring measures responsibility of contractor
Ambient noise	3 locations – selected for each sampling program depending on the active construction sites at the time of the sampling program.	Day time and night time noise levels	Once before start of construction and quarterly (yearly 4-times) during construction	Contractor	Cost for implementation of monitoring measures responsibility of contractor
Surface water quality	3 locations - selected for each sampling program depending on the active construction site at the time of the sampling program	pH, Oil & grease, Cl, F, NO3, TC, FC, Hardness, Turbidity BOD, COD, DO, Total Alkalinity	Once before start of construction and quarterly (yearly 4-times) during construction	Contractor	Cost for implementation of monitoring measures responsibility of contractor

F. Training and capacity building

11. The PMCDC Environment Specialist will be responsible for training the PCO, PIU and contractors. Training modules will need to cover safeguards awareness and management in accordance with both ADB and government requirements as specified below.

(i) sensitization on ADB's safeguard policy on environment;
(ii) introduction to environment and environmental considerations in urban infrastructures;
(iii) review of IEEs and integration into the project detailed design;
(iv) improved coordination within nodal departments; and
(v) monitoring and reporting system. The contractors will be required to conduct environmental awareness and orientation of workers prior to deployment to work sites.

12. Methodology. Capacity building activities will be achieved through combination of practical methodologies available such as lecture and workshop training by experts, on-the-job training and mentoring, and continuing team meetings and exercises. The PMCDC Environment Specialist will spearhead the designing of specific programs appropriate for the target participants or stakeholders, including the execution of these programs during the different implementation phases of the URLIP, which includes the subproject. Pre-training and post-training assessment will be an integral part of the overall program to measure its effectiveness, and identify any other needed interventions to improve effectiveness, if necessary.

13. As fundamental component for the capacity building program, basic lectures and seminar training sessions will be provided by the PMCDC Environment Specialist to strengthen the awareness of project stakeholders on the requirements of ADB SPS and government environmental laws, rules and regulations. Modules will be prepared and customized based on the skills set and needs of the different stakeholders. The entire training will cover basic principles of environmental assessment and management mitigation plans and programs, implementation techniques, monitoring methods and tools. A proposed lecture and seminar training program along with the frequency of sessions is presented in the following table.

Table7: Sample Lecture and Seminar Training Program for Environmental Management

Items	Pre-construction	Construction	
Training Title	Orientation workshop	Orientation program/ workshop for contractors and supervisory staff	Experiences and best practices sharing
Purpose	To make the participants aware of the environmental safeguard requirements of ADB and Government of Nepal and how the project will meet these requirements	To build the capacity of the staff for effective implementation of the designed EMPs aimed at meeting the environmental safeguard compliance of ADB and Government of Nepal	Improving implementation of EMP

Items	Pre-construction	Construction	
Contents	Module 1: Orientation ADB Safeguards Policy Statement Government of Nepal Environmental Laws and Regulations Module 2: Environmental Assessment Process ADB environmental process, identification of impacts and mitigation measures, formulation of an environmental management plan (EMP), implementation, and monitoring requirements Review of environmental assessment report to comply with ADB requirements Incorporation of EMP into the project design and contracts	Roles and responsibilities of officials/contractors/consultants towards protection of the environment Environmental issues during construction Implementation of EMP Monitoring of EMP implementation Reporting requirements	Experiences on EMP implementation – issues and challenges
Duration	1day	1day	Best practices followed
Participants	PCO and PIU staff (technical and environmental) involved in the project implementation	PCO, PIU, Contractors	PCO, PIU, Contractors

G. Environmental Management and Monitoring Plan Implementation Cost (Indicative)

14. Most of environmental mitigation and enhancement measures are integrated into the design and cost are included as part of the civil works contract. Some items need to be incorporated in the Bill of Quantities (BOQ) of this subproject including the environmental monitoring costs. The environmental costs presented in table below are tentative provisions based on experience of undertaking similar works under different DUDBC projects. For the details of environmental costs under civil works contract, individual contract package bid document may be consulted. Contractors will bear the direct costs of all mitigation measures during construction, which will be included in the tender and contract documents; this includes features built into facility designs to prevent environmental impacts from arising. The PIU will bear the costs related to mitigation measures during operation. Costs related to environmental supervision during construction will be borne by the PIU, the PCU (for the activities of the environmental consultants) and by the contractors (for monitoring work carried out by the EHS Officer/s). During the operation phase, monitoring costs will be borne by the Devdaha Municipality and/or the PIU.

Table 6: Environmental Monitoring Cost for Devdaha

Parameter	Sampling Criteria	No. of Samples	Frequency	Total # of Samples	Cost of Analysis / Sample	Total Cost
Air Quality	One Sample at each Road Construction Site + Control Samples outside at each of the construction site	6	Quarterly for 2.5 Years (10 Quarters)	60	NPR 10,000.00	NPR 600,000
Noise Quality	One Sample at each Road Construction Site + Control Samples may not be necessary as it needs to be compared with noise levels to be met	3	Quarterly for 2.5 Years (10 Quarters)	30	NPR 6,000	NPR 180,000
Surface Water Quality	One Sample at near a Surface Water Body at each of the Construction Site + Control Samples may not be necessary as it needs to be compared with water quality standards	3	Quarterly for 2.5 Years (10 Quarters)	30	NPR 25,000	NPR 750,000
Ground Water Quality	One Sample at each Solid Waste Disposal Facility, Campsite and Storage Facility + Control Samples outside each of the SWD, Campsite and Storage Facilities	8	Quarterly for 2.5 Years (10 Quarters)	80	NPR 10,000	NPR 800,000
Soil Quality	One Sample at each Solid Waste Disposal Facility, Campsite and Storage Facility + Control Samples outside each of the SWD, Campsite and Storage Facilities	8	Quarterly for 2.5 Years (10 Quarters)	80	NPR 10,000	NPR 800,000
TOTAL AMOUNT						**3,130,000**

Table 7: Indicative Environmental Management Plan Budget for Bill of Quantities (BOQ) – Devdaha

S.N.	Description of Items	Unit	Quantity	Unit Rate (NPR)	Item Total (NPR)
i.	Environmental Monitoring Cost a) Air Quality, b) Noise level, c) Surface Water Quality d) Ground Water Quality e) Soil Quality	Lumpsum	-	3,13,000	3,13,000

S.N.	Description of Items	Unit	Quantity	Unit Rate (NPR)	Item Total (NPR)
ii.	Tree Replacement (Providing, Planting containerised tree and shrub seedlings, including pitting, transplanting, composting and placing tree guards, curing and maintenance) *Compensatory plantation as per Forest Regulations 2022-Rule 93 (5), loss of 1 tree should be compensated by planting 10 trees*	No's. (as per actual loss of trees)	56	4,500	252,000
iii	Providing and maintaining adequate potable water supply facilities at camp site and work site to the entire satisfaction of engineer-in-charge (Considering 6 Construction Sites and 1 Campsite)	Days	1800	4000	7,200,000
iv.	Personal Protective Equipments (PPE) to the entire satisfaction of the engineer-in-charge (at 6 Construction Sites)	Nos.	6	300000	1,800,000
v.	Traffic management during construction, equipment for traffic management (Barricade with green nets, Visible warning and danger signs in construction sites) (at 6 Construction Sites)	Nos.	6	100000	600,000
vi.	Dust suppression measures by Spraying Water (excluding watering for compaction) as per instruction of Engineer appointed by PIU (3 times a day up to contact period excluding monsoon and planning period)	Nos	2160	500	1,080,000
vii.	Debris disposal and waste management on camp sites to the entire satisfaction of the engineer-in-charge (Only Campsite)	Nos.	1	100000	100,000
viii.	Restoration of ancillary sites including stockpile sites, borrow areas, workforce camp, to the entire satisfaction of the engineer-in-charge (Including campsites - assuming 6 locations)	Nos.	6	100000	600,000
ix.	Maintain First aid box and fire extinguisher at camp site to the entire satisfaction of the engineer-in-charge. (Campsite, Storage Site, and 6 Construction Sites)	Nos.	8	150000	1,200,000
x.	Separate male female toilet facilities for camp and worksite to the entire satisfaction of the engineer-in-charge (6 Construction Sites and One Campsite and two toilets in each site)	Nos.	8	150000	1,200,000
ix.	Plantation and greenery promotion works as per instruction of Engineer appointed by PIU	PS	1	2,000,000.00	2,000,000.00

S.N.	Description of Items	Unit	Quantity	Unit Rate (NPR)	Item Total (NPR)
x.	Standard Traffic Cones with necessary ropes/ribbon and Traffic Barricades (1.00 m height) fabricated with MS pipes of 50mm with necessary traffic sign in both ends	Nos	50	3,000.00	150,000.00
xi.	Use of 6 numbers of Standard LED Traffic Control Batons, 4 numbers of Standard Reflective Traffic Regulatory sign Such as "STOP & GO" and "KEEP RIGHT/LEFT" and Standard reflective traffic warning sign Such as "DIVERSION AHEAD", "SHARP BEND" and other Sign as required, 6 numbers along working stretches per gang during construction.	set	30	5,000.00	150,000.00
xii.	Implementation of additional occupational health and safety measures related to prevention of COVID-19	Lumpsum	-	500000	500,000
xiii	EMP implementation Trainings for the awareness of the environmental safeguard requirements of ADB and GoN during the pre-construction stage and to build capacity of the staff for effective implementation of designed EMPs during construction period.	Days	4	100,000.00	400,000.00
	Indicative Cost (Total Amount)				**17,232,000**

H. GRIEVANCE REDRESS MECHANISM

15. A project-specific grievance redress mechanism (GRM) will be established to receive, evaluate, and facilitate resolution of affected persons' concerns, complaints, and grievances related to social, environmental, and other concerns on the project. The project adopts a three-tier GR and will ensure greater accountability of the project authorities towards affected persons. Grievances may be routed through letters, emails, text messages, verbal narration, grievance box and registers. The GRM is not intended to bypass the government's own legal process, but to provide a time-bound and transparent mechanism to resolve such concerns that is readily accessible to all segments of the affected persons and community. The aggrieved party shall be free to approach the national legal system at any given time. All costs involved in resolving the complaints (meetings, consultations, communications, and reporting/information dissemination) will be borne by the project.

16. PIU will ensure local community meetings are held to notify users and affected persons and other stakeholders about grievance redress mechanism of the project. Awareness of grievance redress procedures will be created through the public awareness campaign, with the help of print and electronic media and radio. The key functions of the GRC are to (i) provide support for affected persons or any aggrieved party to lodge their complaints; (ii) record the complaints; (iii) facilitate grievance resolution in consultation with affected persons and concerned authorities; (iv) report to the aggrieved parties about the decision/solution; and (v) forward the unresolved cases to higher levels.

17. Grievance redress committees (GRCs) will be formed at three levels viz. ward/field level, PIU level and PCO level as under:

18. **First Level GRC (Field/Ward-Level):** The contractors, PIU safeguards personnel can immediately resolve issues on-site in consultation with each other with the support of the designated municipal ward chairperson and will be required to do so within seven days of receipt of a complaint/grievance. In addition, contractors will place complaint boxes at prominent places viz. public places, contractor camp site etc. where local community members can put their complaints/grievances and contractor's personnel should be in charge to collect and process the complaints/grievances as necessary. The PIU safeguards personnel, SDC safeguards consultants and contractor can immediately resolve the complaint on site. If the grievance remains unresolved within the stipulated time, the matter will be referred to the next GRC level. The field/ward-level GRC will comprise of the following:

(i) Ward Chairperson (Committee Chairperson)
(ii) PIU Engineer
(iii) Ward Member representing vulnerable community (one women and one *janjanati* representative, if required)
(iv) Contractor's Representative
(v) SDC Safeguards Specialist
(vi) Ward Chairperson's secretary will act as complaint receiving office and provide secretarial services to GRC.

19. The ward-level GRC shall have at least one women member. For project-related grievances, representatives of affected persons, and community-based organizations will be invited as observers during GRC meetings. In case of impact on indigenous peoples, the grievance team must have representation of the affected indigenous peoples, and or CSOs/NGOs working with the indigenous peoples' groups.

20. **Second Level GRC (Municipality/PIU-Level):** Any unresolved issues at ward level will be referred to the second level GRC chaired by Mayor/Deputy Mayor. The complainant

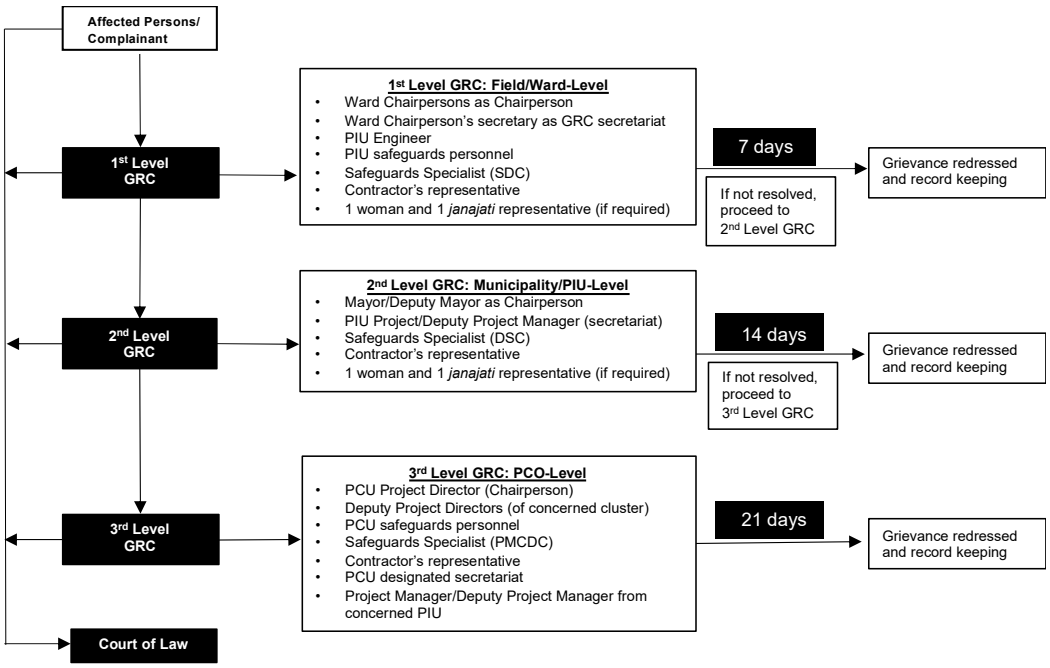
will be notified by the ward-level GRC that the grievance is forwarded to the municipality (PIU) level. All evidence submitted while lodging the complaint by the affected will also be forwarded. After proper examination and verification of the grievances, the committee will facilitate affected persons, and concerned parties to agree on a time-bound action plan to resolve the grievance if found to be valid. The GRC at this level will have to respond to its decision within 14 days of receipt of complaint from first level. The second level GRC will comprise the following:

(i) Mayor/Deputy Mayor (Committee Chairperson)
(ii) PIU safeguard personnel
(iii) SDC social/environment specialist
(iv) Contractor's representative
(v) Ward member representing vulnerable community (one women and one *janjanati* representative, if required)
(vi) Project manager of the PIU will act as a secretariat.

21. **Third Level GRC (PCO-Level):** If the grievance remains unresolved within the stipulated time, the matter will be referred to the PCO level. The PIU safeguards team will refer any unresolved or major issues to the PCO-level GRC. The PCO-level will comprise the following:

(i) Project Director (Committee Chairperson)
(ii) Deputy Project Directors
(iii) PCO Safeguards Personnel
(iv) Safeguards Specialist
(v) Contractor's Representative
(vi) Project Manager/Deputy Project Manager from concerned PIU/municipality
(vii) PCO-designated personnel who will act as secretariat.

Figure 2: Grievance Redress Procedures – URLIP



22. Record-keeping. The PIU/PCO/PMCDC will keep records of grievances received, including contact details of complainant, date the complaint was received, nature of grievance, agreed corrective actions and the date these were affected and final outcome. All complaints should be signed with complete information on name, contact address, phone number if any so that the person can be contacted when required. A sample template is provided in Appendix 4. An acknowledgement to the effect that the complaint has been received by the coordinator's office should be promptly sent to the complainants. All complaints received should be first registered, categorized and prioritized. They should be analysed and assessed the concerns raised by the affected parties and have discussion and consultation with them. Records of all such proceedings should be maintained, for future reference, and the attendance of all participants with their signature, in particular the complaints and affected groups should be recorded. The number of grievances recorded and resolved, and the outcomes will be displayed/disclosed in the PCO, PIU offices, and on the web, as well as reported in monitoring reports submitted to ADB on a semi-annual basis.

23. Periodic review and documentation of lessons learned. The PCO project officers (Social and Environment) will periodically review the functioning of the GRM in each municipality and record information on the effectiveness of the mechanism, especially on the project's ability to prevent and address grievances.

24. Costs. All costs involved in resolving the complaints (meetings, consultations, communication and reporting/information dissemination) will be borne by the PCO and concerned PIU.

25. Accountability Mechanism. Despite the project GRM, an aggrieved person shall have access to the country's legal system at any stage and accessing the country's legal system can run parallel to accessing the GRM and is not dependent on the negative outcome of the GRM. In the event that the established GRM is not in a position to resolve the issue, the affected person also can use the ADB Accountability Mechanism (AM) through directly contacting (in writing) the Complaint Receiving Officer (CRO) at ADB headquarters or the ADB Nepal Resident Mission (NRM).3 Before submitting a complaint to the Accountability Mechanism, it is necessary that an affected person makes a good faith effort to solve the problem by working with the concerned ADB operations department and/or NRM. Only after doing that, and if they are still dissatisfied, will the Accountability Mechanism consider the complaint eligible for review. The ADB Accountability Mechanism information will be included in the project-relevant information to be distributed to the affected communities, as part of the project GRM.