Site Specific Environmental and Social Management Plan
(SSE & SMP)

Site No.07
Polgahawela Bus stand, Kurunegala District - Package 4

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Prepared for:

Sri Lanka Landslide Mitigation Project
Asia Infrastructure Investment Bank
(AIIB)

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Abbreviations

AIIB	Asian Infrastructure Investment Bank
CEA	Central Environmental Authority
DFC	Department of Forest Conservation
DS	Divisional Secretary
DWLC	Department of Wild Life Conservation
ES	Environmental & Social
E & SU of PMU	Environmental & Social Unit of Project Management Unit
E & S & H & S unit of PMU	Environmental & Social & Health & Safety Unit of Project Management Unit
ESMF	Environmental and Social Management Framework
ESMP	Environmental Social Management Plan
SSE & SMP	Site Specific Environmental and Social Management Plan
GN	Grama Niladhari
GOSL	Government of Sri Lanka
GSMB	Geological & Mines Bureau
NBRO	National Building Research Organization
RDA	Road Development Authority

1. Introduction

The Government of Sri Lanka intends obtaining a loan from the Asian Infrastructure Investment Bank (AIIB) for mitigating/rectifying unstable slopes in high risk areas especially in 11 districts of 06 provinces of the country. The project requires to be implemented in accordance with environmental and social safeguards and mandates of the AIIB and that of Sri Lanka. Considering the nature of project actions and its implementation, an environmental and social management framework has been (ESMF) prepared as required by the AIIB environmental and social safeguard policy.

The purpose of the environmental and social management framework (ESMF) is to provide a guide for application of AIIB safeguards and national environmental and social mandates during the implementation of project actions. The project implementing agency (NBRO) is expected to ensure implementation of environmental and social management plans prepared under the ESMF during all phases of project implementation so that the impacts on the environment and community are minimum.

During the scoping exercise it was revealed that the environmental & social setting, and health & safety conditions are more site specific, and require to be addressed specific to site conditions. Therefore, the ESMF has recommended a site specific environmental and social assessments followed by Site Specific Environmental and Social Management Plans (SSE&SMP) for each site. The SSE&SMP gives planning, design, construction and operation phase environmental, social, and health & safety management measures to be considered in the project Implementation.

This is the site specific environmental and social management plan for Polgahawela Bus Stand landslide mitigation site. The plan has been prepared by an in-depth environmental and social assessment to;

i. Identify sensitive environmental and social elements in the project influence area
ii. Identify significant environmental and social impacts due to project actions
iii. Propose mitigation measures
iv. Decide appropriate environmental and social monitoring requirements specific to this project
v. Study relevant environmental regulation and procedures to be followed during project implementation specific to the site

2.Location details and site description

Site reference: Site No. 07, package-4, Kurunegala District, Polgahawela Bus Stand

Site Details

i. The site falls administratively under Epakanda Grama Niladhari Division (GN division) of Polgahawela Divisional Secretariat Division (DS Division), Kurunegala District of North Western Province.
ii. The site is located at Polgahawela Bus Stand.
iii. The site is located at Polgahwela town the nearest town is Alawwa, 8.7 km from Polgahawela town
iv. GPS reference of the site is 7.336010 N, 80.299569E. Ref. Map of the location Fig 1.
v. The land ownership is local government and private

Fig 1: Google image of the proposed land slide mitigation site and surrounding environmental features and service infrastructure.

3. Landslide hazard incident details

A cut slope with a concrete retaining wall at the rear boundary of the Polgahawela Bus Stand had subjected to sudden collapse in May 2018. The slope had been cut and reinforced with a retaining cum a surface drain system in 1980's. A section of the slope together with the part of the retaining wall had collapsed following a heavy precipitate in May 2018. There is a house with occupants on upslope who were asked for immediate evacuation after the incident. The occupants later returned to original place, but they are vigilant on future slope movement and on heavy rainfall events.

The damages occurred due to incident

Due to the slope failure no houses were damaged. A water tank which made for the supply of water to houses at upslope area had been damaged due to the slope failure. There is another small building which is also damaged. The incident has no casualties, and no significant crop/ agricultural lands damaged due to incident.

<table>
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<tr><td>Fig 2a: Polgahawela Bus Stand</td><td>Fig 2b: Slope failure at the rear boundary of bus stand</td></tr>
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<tr><td>Fig 2c: Damaged water tank and building behind the water tank</td><td>Fig 2d: Risk house at upslope area</td></tr>
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Fig 2: Images of the project area

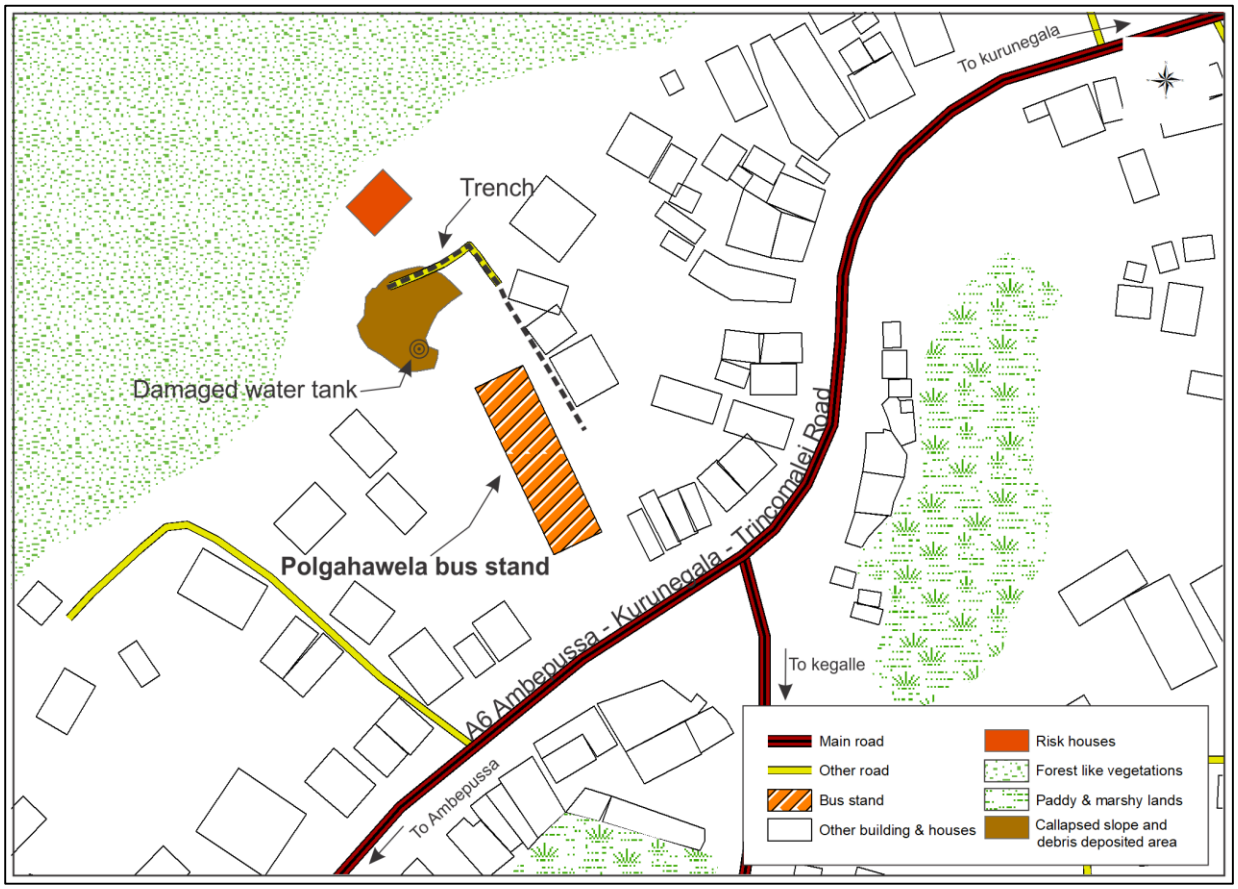

Fig 3: Diagrammatic interpretation of affected slope area and buildings due to ground movement

4. Description of any remedial measures already undertaken to reduce the potential risk

With the request of Polgahawela Divisional Secretary, a team of district office NBRO has inspected the risk on Polgahawela Bus Stand on 29.05.2018. Report recommended to evacuate occupants of the house of Mr. T D Kichchil during heavy rains. Further, the report recommends not to occupy the unsafe area of the bus stand and uses to be aware of unstable banks. Improvement to drainage system at the upslope area has been recommended as a remedial measure. However, at the time of inspection neither warning signs nor the improvement to drainage or any other form of remediation observed.

Evacuations: There was a temporary evacuation by the occupants in upslope houses but have returned later.

5. Description of the area of the landslide and areas adjacent to the landslide and current level of risk

The Polgahawela bus stand, where the failed slope is located at the Pogahawela Dutugemunu junction adjoining Colombo Kurunegala road. The bus stand is a busy place of commuters, and busses are operated to many routes day and night. The place at the rear boundary is used as a parking area for buses mainly during day time.

After the incident the deformed slope geometry, the loosen soils and tension crack on the crown area have created favourable conditions for high ingress of water to make slope highly susceptible to a future failure. As no any remediation measurers have been done to improve the slope stability, the slope will experience minor to large scale failures at recurring extreme precipitations making the upslope area and immediate downslope highly unsafe for bus stand users, commuters and the families still living in the upslope area

6. Brief description on the surrounding environment with special reference to sensitive elements that may be affected by the project actions

The surrounding area of the failed slope is urban commercial and residential in the Polgahawela town. The bus stand is located facing Polgahawela Dutugemunu junction at the centre of Polgahawela town adjoining main road of Colombo- Kurunagala. Bus stand is a one large building at the centre in an open space. Many busses running in 8 routes start their journey from this bus stand.

The front face area of the bus stand, which is a junction connecting a main road is a flat terrain and had developed as a commercial area, in this area many shops and business services are established either sides of the road. Rear side of the bus stand premises is a hilly terrain extending towards Northern direction. Just above rear boundary, is the cut slope where failure had occurred. Either sides of bus stand premises or upslope is residential with several houses. The steep slopes above residential lands and crown area of the hilly terrain still remain with healthy tree cover resembling to natural forest.

Unmanaged land use can be seen at the sloppy area. A surface drainage system had been developed during the bus stand construction. However, poor drainage management (drainage filled with soil) is linked to the slope failure. Present land uses in the downslope of the moving slope is largely urban settlements and home gardens with few trees. Home gardens with a houses are found in the upper slope area and right hand side of the slope.

No forested areas, wild life reservations, environmentally sensitive habitats found within the study area. No ecologically significant habitats found. The terrestrial ecology represents mostly lowland rainforest vegetation. But the natural ecology of the area is greatly disturbed and displaced by trees cultivated at home gardens.

The elements and services at risk during the project implementation are;

i. Uses of bus stand and buses
ii. Occupants of the houses at upslope are
iii. Current economic activities the project influence area
iv. The public lavatory of the bus stand

7. Description of the works envisaged under the project

The proposed mitigation works will be largely concentrated on slope modification, improvement to the drainage and retaining structures. Which will include permanent structures to convey the runoff through proper drainage management and directing the runoff to nearby culvert by a surface drain system. Lowering the water table in the unstable seepage area by insertion of horizontal drainage systems coupled with vertical drainage wells will also include into subsurface drainage systems. Reinforcing the weak embankments and etc. will also be considered to strengthen the stability of the slope.

8. Identification of social and environmental impacts and risks related to the works

8.1 Positive impacts

The bus stand is the main bus station in the Polgahawela town. It operates from 04.30 until 22.30 daily and buses are operated 5 routes. There are about 25 buses operating in 5 routes; Pogahawela to Narammala, Rumbukana, Kudagama, Mamanna. Bus stand is a busy place during office hours, school times and on Saturdays. The mitigation will make currently unstable lands stable, securing safety of the houses, buses, passengers, structures and the occupants. The slope will become stable. Hence it will make a safer environment for the bus stand.

8.2 Negative impacts

The work is confined to an area which is already disturbed by a slope failure. Therefore, negative impacts are much localized and limited only to construction period as described below.

8.2.1 Loosing access to land and future development activities

Most of the mitigation works will be carried out in the land of Mr Thuwan Dilshad Kichchcil. Once the mitigation work is done he will lose the future development opportunities of part of the land close to the cut slope. However, under current condition his entire land will be unsafe to occupy or to develop. As the land has been already unsafe there will be no compensation for acquiring land for mitigation work under the project. For the project mitigation structures will be developed in part of the land and it will make the entire area safe making Mr Kichchcil's remaining land safe to occupy. Therefore, there is a great co-benefit to him by the mitigation project.

8.2.2 Ecological, biological impacts, and fauna and flora

The vegetation in the affected slope is already disturbed. The impacts on terrestrial ecosystems is negligible as many project actions will be taking place on already failed or disturbed slopes.

8.2.3 Impact on the drainage pattern of the area

There will be no significant impacts on the drainage pattern in the area.

8.2.4 Erosional impacts and stream bed alterations

The mitigation works in this will focus largely on the slope modification, drainage improvement and retaining structures. Therefore, during rainy season sediment laden flow of runoff is expected to enter the storm water drains in the Polgahawela town.

8.2.5 Water pollution impacts from construction activities

Since there are no streams nearby the (within 100 m distance), the impact is not highly significant. Washout of fines, sedimentation to existing watercourses and siltation in the downstream channels can be expected during the removal of debris, soil produced during the process of drilling and boring, landscaping/reshaping of slopes and etc. may load storm water network with sediments.

8.2.6 Open defecation and waterborne infections spread during construction phase

The effect is insignificant as the site is located in an urban area and adequate sanitary facilitates are available in the near distances.

8.2.7 Impacts on the downstream water uses

The water quality impacts from discharge of wastewater and pollutants to environment during construction phase is not very significant as there are no water ways nearby.

8.2.8 Solid waste disposal issues

Haphazard disposal of Solid waste can become a nuisance, can pollute the runoff and leave various environmental impacts if proper disposal mechanism is not in place during the construction period. The effect is significant unless a proper solid waste disposal mechanism is used during the construction period.

8.2.9 Air pollution impacts

Construction activities that contribute to air pollution include: land clearing, operation of diesel engines, demolition, burning, from storage, transportation disposal of construction materials, construction waste and working with toxic materials (blasting chemicals). During construction, it generates high levels of dust (typically from concrete, cement, wood, stone, silica) and this can carry for large distances over a long period of time. Hence the project will have impacts on neighboring community; especially the day today users of the bus stand if the works are envisaged during dry weather periods.

8.2.10 Noise pollution, vibration, blasting, impacts during construction, potential damage to buildings, infrastructure

Noise and vibration is expected from construction equipment. Noise impact is significant as there are buildings with occupants living closes to the site. Hence the project will have impacts on neighboring community; specially the occupants in the houses and users of bus stand.

8.2.11 Relations between workers and the people living in the vicinity of the site and possibility of disputes

There may be disputes with the workers of construction site and the occupants in houses, and the users of the bus stand as all of them have to use common access paths, parking places etc.

8.2.12 Work camps and lay-down sites requirement

The solid waste and sewerage removal in the camp if not properly done will be a nuisance to the surrounding community.

8.2.13 Risks of public accessing the site during construction

The site may have machinery with high hazard risk such as drilling, boring and excavation machines etc. Only skilled workforce will be safe working in this environment. If unauthorized persons accesses the site there may be a risk of being subjected to accidents by the heavy machinery.

8.2.14 Explosive hazards and hazardous materials

This project will not envisage rock blasting.

8.2.15 Road traffic and Safety to the public from construction activities: risk for commuters

There will be safety issues during construction phase as common to any landslide mitigation site. Possible safety risks at this place could be high as construction work will be taking place inside the bus stand which is a busy public place with moving busses and passengers. The moving machinery and trucks etc. can obstruct the passages of the bus stand and the parking spaces etc. Possibility of accidents is high many passengers are there during day and night.

8.2.16 Workers safety during construction

As the heavy construction machinery may be used in limited work spaces, risk of hazard from vehicle and construction machinery accidents is significant. Contractor may engage under age workers (children) for construction work, which is risky results serious accidents and injuries.

9. Public and Stakeholder consultations that have been held and/or will be held

Mr Thuwan Dilshad Kichchil, the occupant of the house at upslope area was consulted during the visit. A meaning full consultation was carried out with this person as most of the project activities will be taking place in his land including access to sites, and use of his passage for moving of machinery etc. As this mitigation work is very much beneficial to him he has indicated his full support to the project including access for construction machinery. Mr SA Nanadeasena Time Keeper of the Bus stand was also consulted during field visit. He stated the maintenance activities of the Bus stand is carried out by the Polgawela Pradeshiya Sabha and to inform the Pradeshiya Sabha on any activity that is taking place within the bus stand premises.(Ref: Annexure II: Images of the site condition and the consultation.)

9.1 Stakeholders involved in the consultations any recommendations or agreements reached in the consultations (Ref: annexure III)

10. Significant Environmental and Social Issues: Social or Environmental impacts or risks that will require special measures on the part of NBRO and the contractor; Indicative significant impacts

10.1 Impacts on water or wetlands (issues relating to changes or contamination of streams, rivers and other bodies of water, typically downstream from the site). This includes long-term impacts and potential impacts and risks during construction/remediation of the landslide site

Improper disposal of oils and other harmful substances/contaminants from machineries, leakages from temporary storage tanks, solid waste and wastewater disposal/dumping from workers sites could occur causing adverse impacts on the environment. Since there is no water stream nearby the impacts will be localized and insignificant.

10.2 Erosional impacts and stream bed alterations

Erosional impacts on the upslope area is high if the work envisaged during rainy weather periods. The water with high suspended solids may result overland flow with muddy water and may enter storm water drains during wet periods, resulting muddy water in the bus stand premises, siltation in drains etc.

10.3 Impacts on transport infrastructure (especially temporary loss of road or rail access, risks of traffic congestion)

The contractor's moving machinery, Lorries and trucks etc. will use the common passage and parking places. During rush hours there can be obstructions for free movement of buses and passengers. The contractor may use parking spaces as storage areas or to park construction machinery and vehicles. This may obstruct the convenient operation of bus stand activities.

10.4 Impacts on downstream service provision (water supply, sewerage, electricity, etc.)

The water supply tank damage, toppled is not used to supply water. Hence has no impact. There are no impacts on sewage, electricity lines also.

10.5 Households living in high-risk or medium-risk areas adjacent or near to the site (up-slope, down-slope, downstream, etc.)

The construction pose high risk on public safety, noise and vibration impacts, and cracks in buildings and the houses. The risk of accidents may be high during rush times and in night.

10.6 Areas used for businesses, agriculture or other within the area to be remediated

There are no any business, agriculture or other within the area to be remedied

10.7 Areas used for businesses, agriculture or other immediately to the site

The mitigated site is located in a business area, Polgahawela town. However, as the site located in the rear end of the bus stand impacts on business and commercial activities in the front end area will not be highly affected.

10.8 Need for people to enter or cross the site

There is no special need for people to enter the site for other purposes. However, unauthorised entry of people may occur due to intentional or unintentional purposes, they may be at risk from operating machinery, and vehicles, electricity, and may be blasting materials.

10.9 Priority Health and Safety Issues; Specific H & S concerns that require measures that go beyond the standard contractual requirements for contractors

The health and safety issues pertinent to this site is largely common to any landslide mitigation site. Such common E & HS issues have been discussed in the **ESMF**. Worker safety requirement in the construction site is more detailed under 2003 5: Safety equipment and clothing in the section 2003: Working conditions and community health and safety in the Bidding document.

10.10 Child labour & forced labour

Child labor & Forced labor is detailed under 2003.3 under section 2003: Working conditions and community health and safety in the Bidding document.

11 Clearances, no objection, consent and approvals required for the implementation of the project

11.1 Project implementation

i. Approval from the District Secretariat
   The approvals will require to be obtained from the District secretary for the implementation of project where the proposals need to be presented at the district coordinating committee, to which chief minister and stakeholder agencies in the district will also participate. The Officer of PMU will present the project, disclose the project details and various concerns including environmental and social. The issues will be discussed, the recommendation proposed at this meeting will be considered in the implementation of the ESMP

ii. Approval from the planning committee
   The project will obtain the approval from the planning committee of the Polgahawela Pradeshiya Sabha

11.2 Approval from state land owners to implement the project in state lands of the site

This is covered under section 11.i, ii.

11.3 Approval from environmental authority, Department of Forest, Department of Wildlife Conservation

As project site is located in a privately owned land and not under jurisdiction of DFC or DWLC, hence these approvals are not required.

11.4 Other approvals

i. Approval from regional Geological Surveys and Mines Bureau will be obtained for transportation and disposal of earth, rocks and mineral debris
ii. Approval for extraction of materials - Approval from Geological & Mines Bureau (GSMB) is needed (if necessary only).
iii. Approvals from Polgahawela Pradeshiya Sabha will be obtained for the disposal of waste and plant litter
iv. Approval through the Divisional Secretory from the district office of Ministry of Defense will be obtained for the sites if requiring rock blasting
v. Approvals from regional office of Ceylon Electricity Board will be required for power supply for site operation.

11.5 Consent/ no objection/ legally bound agreements from the private land ownerships

i. A legally bound agreement between the land owner Mr. T D Kichchil and the project implementing authority will be signed allowing no-objection to remove the structures, access the land, implement construction works, and engage in long-term maintenance works

ii. There is a water supply lines and a water tank and building unit already damaged by the slope failure in the proposed mitigation area. These may require to be removed. These will be removed with concurrence of Polgahawela Pradeshiya Sabha.

Table 1: The tentative timeline for getting approvals

Approvals	**Month 1**				**Month 2**			
	W1	**W2**	**W3**	**W4**	**W1**	**W2**	**W3**	**W4**
Project implementation ***Approval from the District Secretariat*** Submission of application Project briefing Respond to comments Approvals								
Approval from planning committee Submission of application Project briefing Respond to comments Approvals								
Approval from state land owners Polgahawela Pradeshiya Sabha Submission of application Respond to comments Approvals								
Other approvals GSMB Ministry of Defense (Depends on the requirement)								
Consent/ no objection from the private land ownership								

12. Environmental Social Management Plan (ESMP) Measures to manage and / or mitigate the impacts and risks, especially the impacts and risks identified in Sections 8 & 10. This will be included in the specific recommendations and requirements of the ESMP.

12.1 Resettlement action plan

Will not be applicable to this site as there is no project based resettlement. However, houses may have some impacts in the form of structural damage during the project actions due to ground vibration induced by heavy machinery operation. (A scheme of compensation, in case of damage to structures due to project should be arranged, (Refer 2002.2 17- utilities and roadside amenities in contractor's requirement to ESMP.

12.2 Evacuation of people: arrangements to move people from the site or areas immediately adjacent to the site, or from high-risk areas up-slope/down-slope or downstream from the site

This risk may not be triggered in this site.

12.3 Procedure for removal of damaged structures, facilities infrastructure

The water tank even if damaged should not be removed without full approval from the Polgahawela Pradeshiya Sabha. They may consider removal of the structure at the project cost as it has no future value. But, signing a legally bound agreement between the property owner and the project implementing authority allowing no-objection to remove the structures is mandatory.

12.4 Requirement for compensation for loss of property / uses due to project actions

May be triggered if project based cracks occur in the houses. The project should have an arrangement to pay compensation to the affected parties based on a technical evaluation report.

12.5 Public awareness is and education- needed for following areas

i. Programs to inform and educate people in the vicinity about the risks posed by landslides and importance of mitigation risk.
ii. Requirement for special awareness for communities with potentially high risk during construction phase; short-term early warning measures (evacuation), and measures related to construction and land-use.

12.6 Design based environmental/ social management considerations

Following environmental and social design considerations are recommended for this depending on its environmental and social relevance.

Table 2: Design stage Environmental & Social considerations

Design feature	Recommended level of consideration for this site
i. Natural resource management and resource optimized designs Project specific designs should be considered to eliminate mass clearing of vegetation and should limit a minimum number of removal of tree species. Sufficient emphasis should be made to consider conservation of trees if important tree species are found	Moderate
ii. Habitat connectivity and animal trails If large fraction of vegetation is required to be cleared in ecologically fragile habitats for permanent structures or for access, or if deep drains etc. are to be made the designs should include habitat connectivity features, animal trails and vegetation strips and etc. even if the impact are localized.	Low
iii. Conservation of water resources This involves extraction of water both surface and sub-surface. The water extracted is in relatively good quality. In a well thought design this extracted water can be conveyed in such a manner that the water can be accessed by wild fauna as well as the neighboring communities for bathing and other domestic purposes, even as drinking water.	low
iv. Interruption to water supplies If the water in the mitigated slope is used as a source for individual or community water supply, the chance the water source can be affected by the mitigation work is high due to water table draw down. In such instances the design should include alternative source of water for the community (temporary/or permanent).	Not relevant
v. Aesthetically compatible design considerations The designs in aesthetically sensitive environments should consider structures that blend with natural environment to keep the visual pollution to minimum. Service of landscape architect may be important for the design of suitable mitigation structures.	High
vi. Consideration of green environmental features As many of the mitigations works are carried out in ecologically sensitive habitats, It is recommended to consider green environmental designs as much as possible in the designs e.g.: use of local vegetation species for erosion control, combination of plants to sustain species diversity in the environment, avoiding inclusion of potentially invasive species, use of excavation materials for construction and etc. .	High

vii. Workers/ commuters and community safety Activation of slide may occur during construction phase and may pose threat to workers and commuters. Therefore design based safety consideration such as berms, safety nets etc. should be considered (permanent/temporary)	Moderate
viii. Erosion control structures In drainage management, water is extracted and conveyed to nearby streams often through culverts. During rainy season the flow in these drainage structures can be significantly high and this may cause stream bed and bank erosion. Hence the design should adequately consider flow speed breakers to reduce erosive flows entering natural streams. This should be an inclusive part of the design if there are streams and culverts in the proximity of the mitigation site.	Low
ix. Low post maintenance and operation designs The mitigation should consider passive techniques such as gravity drains for drainage management. Correct pipe diameters, pore diameters and laying angles should be considered to avoid clogging of drains. Low maintenance structures and designs such as designs to withstand erosive forces, sediment trapping systems etc. should be considered if drain water is expected to be directed to natural streams. The materials with high durability should be used for structures and should be chosen carefully so as to withstand local weather conditions. Designs should specially consider corrosion prevention techniques if steel structures are used and geotextiles if fine sediments are prone to enter sub drains.	High

12.7 Mitigation of impacts during the construction phase

12.7.1 Construction contractors' requirement to comply with environmental and social management during the construction phase

Measures to manage and to mitigate the environmental and social impacts are generally common to all landslide mitigation sites. Such impacts are largely attributed to activities in the construction phase. The mitigation of impacts therefore becomes an obligation of construction contractor. NBRO has prepared a comprehensive document on "***contractors' requirement to comply with Environmental and Social and Health and Safety (ES & HS) management during the construction phase"*** to be included in construction contractors' bid document. The main sections are summarised below (Table 3) indicating the degree of relevancy for this site. For details, ESMP for construction contractors should be referred.

The contractor is expected to indicate in the bid the ESMP procedure to be implemented along with relevant proofs of his competency. The cost for ESMP will require to be indicated as a separate pay item. The environmental and social management method statement is expected to be submitted by the selected construction contractor and to be approved by the PMU unit.

Table 3: Contractor requirement to comply with ES & HS

Reference No. as per construction contractors obligation to ESMP	**Item**	**Relevant to the project**
2002 Environmental and Social Monitoring		
2002.2 1)	Storage on site	Highly Relevant (Bus stand parking spaces)
2002.2 2)	Noise and Vibration	Highly Relevant (noise and vibration) (Passenger and public)
2002.2 3)	Cracks and damages to the buildings	Highly Relevant (upslope house)
2002.2 4)	Disposal of waste	Highly Relevant (Public place)
2002.2 5)	Disposal of refuse	Highly Relevant (Public place)
2002.2 6)	Dust control	Highly Relevant) (Public place)
2002.2 7)	Transport of Construction materials and waste	Highly Relevant (public place and a town area)

2002.2 8)	Water	Relevant
2002.2 9)	Flora and Fauna	Relevant
2002.2 10)	Physical and cultural resources	Relevant
2002.2 11)	Soil Erosion	Relevant
2002.2 12)	Soil Contamination	Relevant
2002.2 13)	Borrowing Earth	Relevant
2002.2 14)	Quarry Operations	Not Relevant
2002.2 15)	Maintenance vehicles and Machinery	Relevant
2002.2 16)	Disruption to public	Relevant
2002.2 17)	Utilities and roadside amenities	Relevant
2002.2 18)	Visual environment enhancement	Relevant
2002-5. Environmental Monitoring	Baseline surveys (air, water, noise , vibration, crack surveys)	Refer site specific monitoring plan
	Surveys during construction (air, water, noise , vibration, crack surveys)	Refer site specific monitoring plan
	Surveys during operation phase	Optional
	Reporting and maintenance of records	Relevant
2003. Working Conditions and Community Health and Safety		
2003.2	Safety organization and communication	Relevant (unsafe slops/ commuters/ houses/ heavy machinery)
2003.3	Child Labor and Forced Labor	Relevant
2003.4	Safety reports and notification of accidents	Highly Relevant (public place)
2003.5	Safety Equipment and Clothing	Highly Relevant (public place)
2003.6	Safety Inspections	Highly Relevant (public place)
2003.7	First Aid Facilities	Highly Relevant (public place)
2003.8	Health and safety information and training	Highly Relevant (public place)
2003.9	Plant equipment and qualified personnel	Highly Relevant (public place)

Relevant: *The section is relevant to the site as a common ESMP applicable to any site*
Highly relevant: *The contractor should pay special emphasis in the preparation of environmental method statements to ensure that the relevant ESMP is implemented specific to the site*
Possibly relevant: *This ESMP will be triggered if the site come across with relevant aspect during project implementation*
Not relevant: *The section may not be relevant to this site under disclosed conditions*
Optional: *require to be implement if needed only*
Refer site specific monitoring plan*: Contractor is obliged to carry out monitoring as specified in the site specific monitoring plan in addition to general monitoring indicators requirements for ESMP.*
Reference: Contractors Obligation for implementation of ESMP

12.7.2 Site specific mitigation

Given below is the site specific mitigation measures that the project is expected to implement during the construction period.

Table 4: Site specific ES & HS mitigatory measures

Mitigation item	**Project implementation phase**	**Responsibility**
i. Dust and aerosol control screens Measurers should be taken to control generation of dust and aerosols during the construction work prone to generation of dust, Such may depend on the dust source. Wet scrubbing during dry period, covering the piles and exposed slope surfaces, Servicing the machinery and vehicles to reduce particulate emissions etc. will be recommended.	Construction	Construction Contractor
ii. Traffic management and obstruction to passage The contractor should prepare a well thought site management plan for the bus stand. This plan should be prepared after discussing with OIC of bus stand and PMU. Following is recommended as a minimum for this site	Construction / site preparation	Construction Contractor

• Construction vehicles should use only one passage. • Moving heavy vehicles should be avoided during rush hours • Moving vehicles can be allowed during night, but under proper safety • The passage intend to use to drive vehicles and movement of machinery by the contractor should have night lamps in an adequate numbers during night time operations. • Sign boards are mandatory with luminous colors during night time operations • Traffic control person should be employed during times when vehicles entering or leaving the site		
iii. Public safety and nuisance Contractor should prepare the site operation plan in consultation with the bus stand management covering flowing as a minimum and subjected to approval from the PMU • The contractor should place demarcation sign boards and belts to separate the construction area from the common use areas • Proper sign boards should be established to indicate the slope instability risks, construction work risks and the restricting unauthorized entry • Full time watchmen and night lamps are mandatory • Machinery parking, construction material and waste storage areas should be placed properly without obstructing the bus stand functions • Debris, construction waste, raw material should not be stored on site but removed daily • The access to public toilet facility should not be obstructed • The public toilet facilities should be used with full approval from the bus stand management • Electricity if used should be done carefully to prevent electric shocks and should disconnect during off times	Construction / site preparation	Construction Contractor
iv. Safety to Passengers and commuters The moving machinery and vehicles can poses a risk of accident to passengers. Hence following safety management plan is recommended in addition to recommendations under "**Traffic management and obstruction to passage" under ii.** • Hones of vehicle should be checked for proper operation • Skilled driver should be used for the vehicles • Break systems and tyres should be up-to-date • Speed limits 5km/hr to be maintained within the bus stand • Luminous tags for vehicles and night lamps should be used	Construction / site preparation	Construction Contractor
v. Water for construction Water for construction works should be obtained only from the approved sites	Construction	Construction contractor
vi. Erosion control and overland runoff management • During the excavation work if the surfaces are to be exposed during rainy season it is recommended that it is covered appropriately to prevent erosion and generation of sediment laden runoff • Sediment laden runoff if generated should not let to flow through the bus stand premises, but should be directed properly to storm water drains • Silt traps should be placed to reduce the load of sediments entering the drains • If sediment are filled in the public drains they should be cleaned regularly by the contractor	Construction	Construction contractor
vii. Noise and vibration control	Construction	Construction contractor

• Contractor should execute the work within the prescribed norms for noise and vibration**.** Heavy noisy work should be avoided during rush hours and night • Vibration generating activities should be done carefully not to impact nearby houses, Pre and during work , crack surveys are recommended for upslope and adjoining houses		
viii Safety of neighboring residents It is recommended that the occupants in the house upslope is alerted on the NBRO early warning system and respond accordingly	Construction	PMU ES unit
ix. Contractors workforce code of conduct • The contractor should take necessary steps to maintain high level of discipline among the workforce. Use of narcotics, public smoking, adulteration, dealing with school children and underage passengers any form of sexual miss conduct, disputes with passengers, bus drivers, bus stand management, should be prohibited. • Possession of injurious tools is prohibited at this site • Use of bus stand as a place of resting or for sleeping in the night should not be allowed • Suitable supervision arrangement should be made to control labour force miss conduct within the premises during construction work. • Proper arrangement should be to provide sanitary facilities for workforce. It is recommended not to use the sanitary facilities of the premises without full permission of the bus stand management. • A good record of violation of code of conduct should be maintained for this site available for inspection by PMU.	Construction	Construction contractor
x. Damage to forest area Hunting and poaching of wild animal should not be carried out in the upslope forest areas		

12.7.3Monitoring requirements specific to the site

Following monitoring plan is strongly emphasized during the construction phase specific to this site. In addition to this, monitoring procedure indicated in the contractors' obligation to ESMP should also be implemented by construction contractor.

Table 5: Environmental and Social Monitoring Plan; construction phase

Monitoring requirement	**Parameters**	**Frequency**
i. Baseline monitoring	Stream water quality	-
	Pre crack survey of the high risk houses	Once *
	Ground vibration	Once *
	Background noise measurement	Once *
	Air quality: particulate matter	Once *
ii. During construction	Stream water quality	-
	Crack survey of the high risk houses	If noticeable displacement is observed during construction **
	Ground vibration	During operation of drilling machinery, boring works, or any works that generate ground vibrations*
	Construction noise	During heavy noise generation times *

	Air quality particulate matter	Once a month *
iii. Vehicular Emission	All machinery/vehicles operational should have the emission control test certificate as applicable - should be checked by the site ES officer of the consultant	
iv. Monitoring agency	* A competent independent monitoring agency with registration of Central Environmental Authority for all parameters except crack surveys **Crack surveys should be conducted by competent agency acceptable to PMU	
v. Reporting requirements	**Stream water quality** – Comparison with ambient water quality standards published by the CEA, 2017 **Pre crack survey of the high risk houses**-Professional report **Ground vibration**-as per The interim standards on vibration for the Machinery, Construction activities and Vehicular movements, CEA **Background noise measurement** –Extraordinary Gazette No.924.1, May 23,1996, CEA **Air quality particulate matter**- The National Ambient Air Quality standards stipulated under the Extraordinary Gazette, No. 1562/22 August 15, 2008 -Central Environmental Authority of Sri Lanka.	

13. Grievance redress mechanism for this site

The PMU ES officer is responsible for establishing the grievance redress mechanism for this site with special consideration for following impact communities; **a) Mr Thuwan Dilshad (land owner) b) Pradeshiya Sabha c) House Owners d) Users of bus stand**. It is recommended to keep a grievance box in the bus stand premises *(Reference: Environmental and Social Management Framework for recommended procedure for establishment of grievance redress mechanism)*

14. Information disclosure

It is the responsibility of the PMU to disclose the ES information to following agencies and organizations by indicated modes as a minimum as given in the following table.

Table 6: Proposed scheme of information disclosure

Information	Proposed agencies	Mode of information disclosure
i. Project plan (site details, design , implementation arrangements)	District CEA, DFC, DWLC, District Secretariat, Divisional secretary, RDA, State land owners, Other district levels Agencies, NBRO district office, AIIB	Meetings, District coordination committee, submission of relevant report to sign agreements, approvals and consents.
ii. Environmental and Social Management plan	District CEA, DFC, DWLC, AIIB,	Meetings, District Coordination Committee, submission of relevant report to sign agreements, approvals and consents
iii. Monitoring reports (baseline and during construction)	District CEA, DFC, DWLC, AIIB and relevant parties as appropriate	Progress meetings, special meetings, submission of relevant reports
iv. Site inspections for environmental conformance workers health and safety	District CEA, DFC, DWLC, RDA, Divisional secretary, Police, State Land Owners, Grama Niladhari, District Office NBRO, AIIB and relevant parties as appropriate	Written and verbal communications, submission of relevant reports
v. Decisions taken at the progress review meetings pertinent to ES matters	District CEA, DFC, DWLC, RDA, Divisional secretary, Police, State Land Owners, Grama Niladhari, District Office NBRO, AIIB and relevant parties as appropriate	Meetings, submission of relevant reports
vi. Grievance redress mechanism	Relevant parties , AIIB	Meetings, written and verbal communications

Table 7: Level of information gathered through consulting institutions

Date	**Institution**	**Person contacted for information**
22/10/2018 @ 15.150 hrs.	Divisional secretariat office, Polgahawela	Ms Chandima Herath, NDRSC officer (Over the phone)
22/10/2018 @ 15.150 hrs	Divisional secretariat office, Polgahawela	Ms D. Anoma Dissanayaka, Divisional Secretary, Polgahawela. (Over the phone)
25/10/2018 @ 11.30 hrs	District Environmental Officer Central Environmental Authority	Ms Geethanjalee Seneviratne Director (Over the phone)
25/10/2018 @ 13.30 hrs	Secretary – Pradeshiya Sabha	Mr.Nimal Jayasinghe (over the phone)

Aannexure I: Drone image of the project area

Annexure II : Images of the site condition and the consultation

Fig a: Mr. S.A. Nandasena ;Time Keeper of the Polgahawela Bus Stand was made aware about the mitigation project by NBRO staff. (09-10-2018)

Fig b: Mr.Thuwan Dilshad was made aware about the mitigation work by NBRO staff (09-10-2018)

Fig c: High Risk house– Mr Thuwan Dilshad's house

Fig d: Unstable retaining wall (Constructed in 1982)

Fig e : Existing drainage system filled with mud and debris(Constructed in 1982)

Fig f: Damaged retaining wall

Annexure III: Report on the Stakeholder Consultation: Kurunegala District

Date: 25/10/2018		
Institution	**Name and designation of the contact officer**	**Concerns raised**
Central Environmental Authority	Ms.Neethanjalee Seneviratne Director –CEA Kurunegala District	The Basic Information Questionnaire (BIQ) is needed to fill for the project and submit the application The CEA will grant approval with recommendations.
Pradeshiya Sabha Polgahawela	Mr. Nimal Jayasinghe Secerataty	The approval is needed to do the construction activity, parking, loading, unloading materials within the premises of bus stand

Annexure IV: Proposed procedure for obtaining approvals from state land owners and environmental agencies

1. **Proposed approval procedure for Environmental Clearance form District Central Environmental Authority**
    i. In the project preparation phase, the ES & H&S unit of PMU study the Site specific ESMPs and should submit the project proposal to district office of CEA with details of the Arial extent that would be influenced by the project actions with spatial references to sections of site specific ESMP relevant to the project.
    ii. A basic information questioner (BIQ) should be completed and submitted along with the above details
    iii. CEA may call for project briefing and further information on ESMP that should be provided by the PMU
    iv. Approval will be granted subjected to site specific conditions that should be adhered by the project

Annexure V: Study team

Name	Designation	Position in the study
TDSV Dias	Director/ ESSD/NBRO	Team Leader
SAMS Dissanayake	Senior Scientist/ESSD/NBRO	Senior Environmental Scientist
Prabath Liyanaarachchi	Scientist/ ESSD/NBRO	Environmental scientist
H Kusalasiri	Technical Officer/ESSD/NBRO	GIS/Demographic data /survey support
Suneth Wimalawardhana	Scientist/ LRRMD	Geologist

Annexure VI: List of references

1. NBRO site investigation report on landslide disaster at Polgahawela Bus Stand – (Ref. Report No. NBRO/LRRMD/KU/PLP/L118/31/40018 dated 20.09.2018
2. Contractor's obligations for Environmental and Social Management Plan- Sri Lanka Landslide Mitigation Project-AIIB
3. Environmental and Social Management Framework-Sri Lanka Landslide Mitigation Project _AIIB
4. Resettlement Planning Framework- Sri Lanka Landslide Mitigation Project _AIIB