REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES PROJECT

Site Specific Environmental and Social Management Plan

Site No. 161
Passara Town (Peradeniya-Badulla-Chenkaladi highway, A5)
Badulla District

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Prepared for:

ASIAN INFRASTRUCTURE INVESTMENT BANK

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Table of Content

1. Introduction....1
   1.1 Project overview....1
   1.2 Intended users....1
2. Description of the project....1
   2.1 Name of the project....1
   2.2 Location details....1
   2.3 Topography and land ownership....2
   2.4 Meteorology of the area....3
   2.5 Demographic feature of the area....3
3. Landslide hazard incident details....3
   3.1 Account of incident....3
   3.2 Effects and consequences of landslide....3
   3.3 Description of any remedial measures already undertaken to reduce the potential risk....4
   3.4 Evacuations....4
   3.5 Resettlement (progress)....4
4. Description of the area of the landslide/slope failure and areas adjacent to the landslide and current level of risk....6
   4.1 Area of the landslide....6
   4.2 Areas adjacent to the landslide....6
   4.3 Current level of risk....6
5. Description of the works envisaged under the project....6
6. Brief description on the surrounding environment with special reference to sensitive elements that may be affected by the project actions....7
7. Identification of social and environmental impacts and risks related to the works....9
   7.1 Positive impacts....9
   7.2 Negative impacts....9
      7.2.1 Hydrological and water Quality impacts....9
         7.2.1.1 Impacts of the drainage pattern of the area....9
         7.2.1.2 Water pollution and impacts on surface water quality....10
         7.2.1.3 Erosional impacts and stream bed alterations....10
         7.2.1.4 Open defecation and waterborne infections....10
         7.2.1.5 Impacts on the downstream water uses....10
         7.2.1.6 Impacts on ground water table and ground water quality....10
      7.2.2 Environmental Impacts....10
         7.2.2.1 Noise and vibration impacts....10

7.2.2.2 Air pollution impacts 10
7.2.2.3 Solid waste disposal issues 11
7.2.2.4 Explosive hazards and hazardous materials 11
7.2.3 Biological /Ecological Impacts 11
7.2.3.1 Effects of important wildlife habitats 11
7.2.3.2 Effects on Fauna & Flora 11
7.2.4 Social and Economic Impacts 11
7.2.4.1 Impacts on agriculture within the area to be remedied/ immediately to the site 11
7.2.4.2 Cracks in the building due to vibration impacts 11
7.2.4.3 Loosing access to land and future development activities 11
7.2.4.4 Impacts on livelihood/ business and income activities 11
7.2.4.5 Impacts on service provision (water supply, sewage, electricity) 12
7.2.4.6 Effect due to loss of infrastructure and safety 12
7.2.4.7 Work camps and lay-down site requirements 12
7.2.4.8 Relations between workers and staff/ people living in the vicinity of the site and possibility of disputes 12
7.2.4.9 Workers safety during construction 12
7.2.4.10 Safety to the public from construction activities: High risk for commuters 12
7.2.4.11 Impacts on transport infrastructure (especially temporary loss of road or rail access, risks of traffic congestion) 12
7.2.4.12 Areas used for businesses, agriculture or other within the area to be remediated 12
7.2.4.13 Areas used for businesses, agriculture or other immediately adjacent to the site 13
7.2.4.14 Need for people to enter or cross the site 13
8. Site Specific Risk Analysis 13
9. Significant Environmental and Social Impacts 13
9.1 Priority Health and Safety Issues. Specific H&S concerns that require measures that go beyond the standard contractual requirements for contractors 13
9.2 Child labour & forced labour 14
10. Environmental Social Management Plan (ESMP) 14
10.1 Resettlement action plan 14
10.2Evacuation of people 14
10.3Procedure for removal of damaged structures, facilities infrastructure (consent from owners to remove the articles) 14
10.4 Requirement for compensation for loss of property /uses due to project actions 14
10.5 Public awareness and education- needed for following areas 14
10.6 Design based Environmental/ Social Management considerations 14
10.7 Mitigation of impacts during the construction phase 16

10.7.1Construction contractors' requirement to comply with environmental and social management during the construction phase 16
10.7.2 Site Specific mitigation.....17
10.7.3 Monitoring requirements specific to the site 20
11. Labor management 21
12. Preventive measures for COVID-19 that was issued by Sri Lankan national health authority ……...22
13. Public and Stakeholder Consultations -the public consultations that have been and/or will be held.....22
13.1 Public Consultations 22
13.2 Stakeholders involved in the consultations any recommendations or agreements reached in the consultations (Refer annexure II) 22
14. Clearances, no objection, consent and approvals required for the implementation of the project……. 22
14.1 Project implementation 22
14.2 Approval from the state lands owners relevant to the project 22
14.3 Consent/ no objection/ legally bound agreement from the private land ownerships 23
15. Grievance redress mechanism for this site 23
16. Information disclosure 23

List of Annexes

Annexure I: Images of the site condition and the consultation i
Annexure II: Report on the Stakeholder Consultation: Badulla District ii
Annexure III: Proposed procedure for obtaining approvals from state land owners and environmental agencies. ii
Annexure IV: Study team iii
Annexure: List of references iii

List of Figures

Figure 1: Road map showing the accessibility to the site 2
Figure 2: Drone image of the proposed landslide mitigation site, the surrounding environmental features, and service infrastructure 2
Figure 3: Google image of the proposed landslide mitigation site, the surrounding environmental features and service infrastructure 3
Figure 4: Google image, cross sections, land use, risk elements and the photographs of special features of the location 5
Figure 5: Images of the project area 7
Figure 6a: Damaged road section of Peradeniya-Badulla-Chenkaladi highway (A5) Tension cracks are seen parallel to the road 7
Figure 6b: Cracks in the walls of the house of R.D. Pradeep Roshan -a high-risk house 7
Figure 6c: Common water tank in the down-slope area 8
Figure 6d: Pradeshiya Sabha market building (partially constructed) 8
Figure 6e: Damaged access road section and water supply line of Pradeshiya Sabha - Passara 8
Figure 6f: Shops in front of the damaged road section (A5 road) 8
Figure 6g: A small business place on the damaged road (A5) section 8
Figure 6h: Cracked concrete road to the down-slope area 8
Figure 6i: Stream flowing at the down-slope 9
Figure 6j: Two-storied building with a shop close to the damaged road section 9

List of Tables

Table 1: Negative impacts and their level of significance 9
Table 3: Design stage Environmental & Social considerations 15
Table 4: Contractor requirement to comply with ES & HS 16
Table 5: Site specific ES & HS mitigation measures 17
Table 6: Environmental and Social monitoring plan; construction phase 21
Table 7: Clearances, no objection, consent and approvals 22
Table 8: Tentative timeline for getting approvals 23
Table 9: Proposed scheme of information disclosure 24
Table 10: Level of information gathered through consulting institutions 24

Abbreviations

AIIB	Asian Infrastructure Investment Bank
CEA	Central Environmental Authority
DFC	Department of Forest Conservation
DS	Divisional Secretary
DWLC	Department of Wild Life Conservation
EH & S	Environmental Health & Social
E&SU of PMU	Environmental & Social Unit of Project Management Unit
ESMF	Environmental and Social Management Framework
SSE&SMP	Site-Specific Environmental and Social Management Plan
ESMP	Environmental and Social Management Plan
GN	Grama Niladhari
GOSL	Government of Sri Lanka
GSMB	Geological Surveys & Mines Bureau
NBRO	National Building Research Organization
RHS	Right Hand Side
LHS	Left Hand Side

1. Introduction

1.1 Project Overview

The Government of Sri Lanka has received a loan from the Asian Infrastructure Investment Bank (AIIB) for mitigating/rectifying unstable slopes in high-risk areas especially in 13 districts of 06 provinces of the country under the Reduction of Landslide Vulnerability by Mitigation Measures Project (RLVMMP). 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 (ESMF) has been 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 the 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 the 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 minimal.

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 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 the **Passara town (Peradeniya-Badulla-Chenkaladi highway -A5)** landslide mitigation site. This 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 regulations and procedures to be followed during project implementation specific to the site

1.2 Intended users

The document provides an in-depth insight into site-specific environmental and social issues associated with the proposed project and the mitigation measures and intends to be used by the landslide mitigation design team, the PMU and the contractor in the implementation of the Environmental and Social Management component of the project. The SSE&SMP is published in on the project website (https://rlvmmp.lk/) and can be viewed by wide range of interested parties (public, stakeholder organizations) can be utilized by the contractors for the project and will form the basis of site-specific management plans that will be prepared by the contractors as part of their Site Specific Environmental and Social Management Action Plans (SSE-SMAP) prior to commencing works.

2. Description of the project

2.1 Name of the project

Rectification of Site No.161, Badulla District, for **Passara town along the Peradeniya -Badulla - Chenkaladi highway (A5)**

2.2 Location details

The proposed mitigation site falls under 88/B Passara North GN division of Passara DS division, Badulla District, Uva Province.

GPS references of the site - 6. 935236°N and 81.153540°E

Nearest town and accessibility to the site – Passara

The site can be accessed via Peradeniya-Badulla-Chenkaladi (A5) highway (*Ref. Fig. 1*).

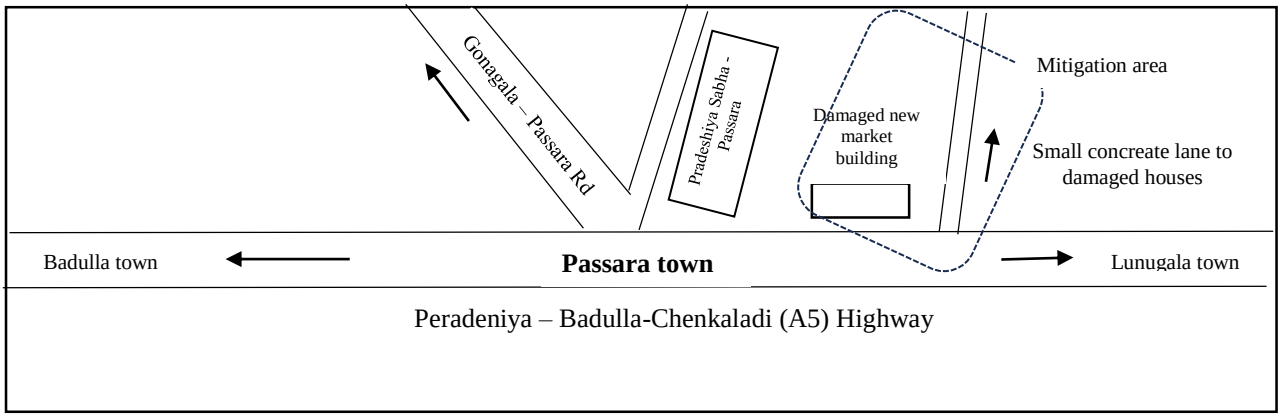


Figure 1: Road map showing the accessibility to the site

2.3 Topography and Land Ownership

The proposed mitigation site is located in Passara town, RHS to Peradeniya - Badulla - Chenkaladi Highway (A5). The site is close to Passara Pradeshiya Sabha. The elevation of the area is 868 m. The extent of the site proposed to be mitigated is about 5500 m^2. There are 14 houses in the mitigation area. A natural stream runs downslope parallel to the road. The land ownership of the proposed mitigation area is Badulla Maha Kataragama Dewalaya (under the Sri Lanka Buddhist Vihara Devala Foundation Act). The road and the road reservation are owned by the Road Development Authority. The partially constructed market centre building of Passara Pradeshiya Sabha is located within the unstable area.
Refer to Figure 2; Drone image of the proposed landslide mitigation site, the surrounding environmental features, and service infrastructure.
Refer to Fig 3: Google image of the proposed landslide mitigation site, the surrounding environmental features and service infrastructure

Figure 2: Drone image of the proposed landslide mitigation site, the surrounding environmental features, and service infrastructure

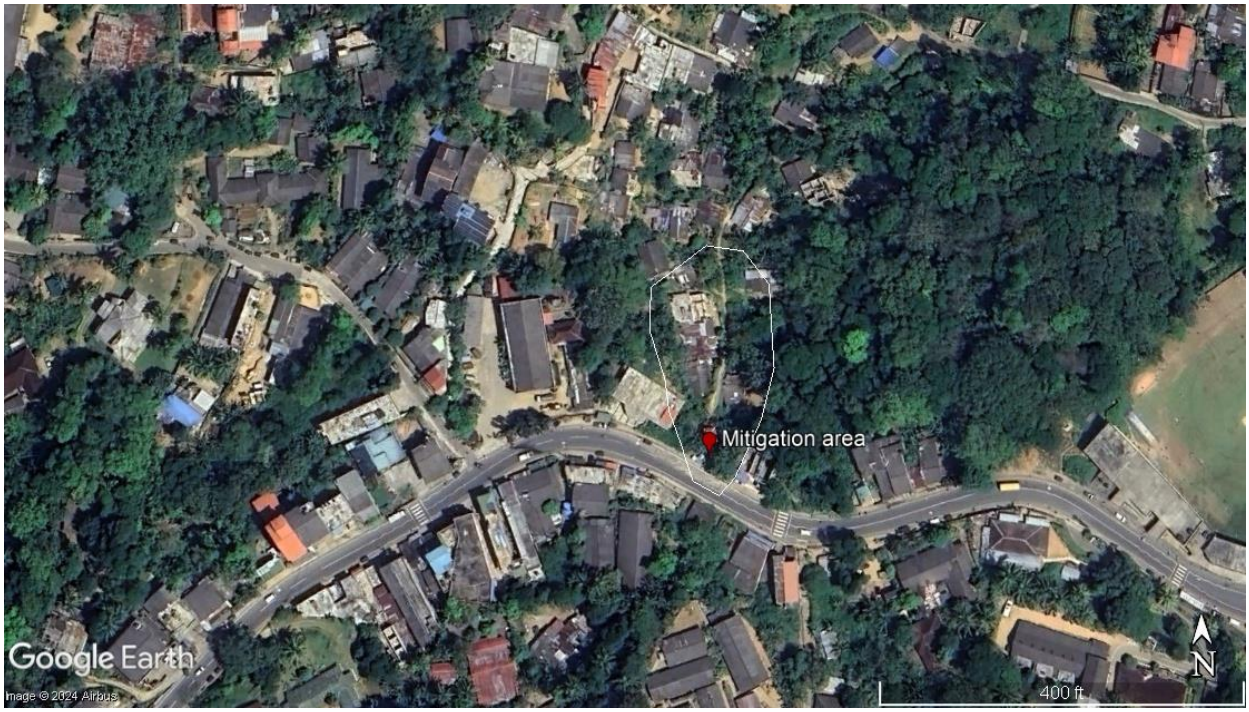


Figure 3: Google image of the proposed landslide mitigation site, the surrounding environmental features and service infrastructure

2.4 Meteorology of the area

Annual average rainfall - 406.89 mm
Annual average temperature - 24.52ºC
(Source: Website of Divisional Secretariat - Passara)

2.5 Demographic features of the area

The Population of Passara North GN Division is 1387 including 696 males and 691 females. (Department of Census and statistical report - 2012).

3. Landslide hazard incident details

3.1 Account of incident

The first signs of ground instability and tension cracks were recorded in the 1980s. There were several houses in the area during that period. According to the information of the Disaster Relief Officer of Divisional Secretarial Passara, the people in this area were asked to evacuate due to the landslide risk. Accordingly, the people had evacuated for a few months and came back to the original location later.
Recently, in December 2023, in this area (Dalukotuwa) adjacent to the Peradeniya - Badulla - Chenkaladi highway (A5), instability was developed with the heavy rainfall received in the area, and the area has been identified as high potential for further massive landslides.

3.2 Effects and consequences of landslide

A poor drainage pattern in the area is observed and excessive seepage of water is also observed in the area. The crown of the creep section is at Peradeniya-Badulla-Chenkaladi highway (A5) road. The movement has subsided a section of the road and a tension crack can be seen parallel to the road. Due to the road instability, only one lane is in operation causing difficulty in traffic movement. The concrete paved road starting from the above main road (to the RHS) has also cracked and subsided. Due to the land instability, several houses were cracked.

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

According to the request of the Divisional Secretary- Passara, an investigation on land instability in Dalukotuwa area was conducted by the Scientists of the National Building Research Organisation on 01st January 2024. Accordingly, taking into account the risk situation and the emergency at the place, recommendations for emergency response were issued on 11.01.2024 (Ref.NBRO report number NBRO/LRRMD/BDL/BDU/PASSARA/LI/24/0023 BD/PSD/L1/2024/00006).
The investigations identified 01 building (damaged) and 08 buildings (undamaged) as high risk and 05 buildings (not damaged) as moderate risk. Based on the observations of land instability such as cracks on buildings, subsidence, and seepage, short-term and long-term recommendations were given.

Short-term recommendations;

1. Evacuation of all people in high-risk areas to safe locations temporarily and people in moderate-risk areas to be vigilant on the land instability in the area and they should evacuate the area if the risk is high.
2. Halt construction of the market centre until obtaining a recommendation of a technical report
3. Stop moving heavy vehicles through the cracked areas of the road
4. Seal all cracks on the ground and the road
5. Repair all weep holes of the retaining wall to discharge water
6. Correct the water drainage above the retaining wall and all unstable area
7. There should be an awareness of the community on the signs of landslides and warnings, and evacuation to safe areas, until implementation of long-term recommendations

Long-term recommendations:

1. Commencing construction of the market centre to be done only after obtaining technical reports from an engineer
2. Take immediate action to stabilize the retaining wall
3. Resettle the people in high risk areas to suitable safe locations.
4. No new development to be done in the area
5. People in moderate areas to be vigilant about the changes in the ground instability
6. The NBRO to be informed if progress in risk

3.4 Evacuations

After the incident in December 2023, residents in 2 houses were evacuated, and 34 residents (13 families) in 8 houses were evacuated to a part of the building of Pradeshiya Sabha, Passara. They lived there for about 5 months and later they came back and settled their own houses.
According to the NBRO report, the people in high risk houses to be resettled in suitable safe locations, however, consultation of affected families indicated that it is impossible to find suitable safe lands in Badulla district and these people live in same places with risk.

3.5 Resettlement (progress)

There is no program of resettlement up to now.

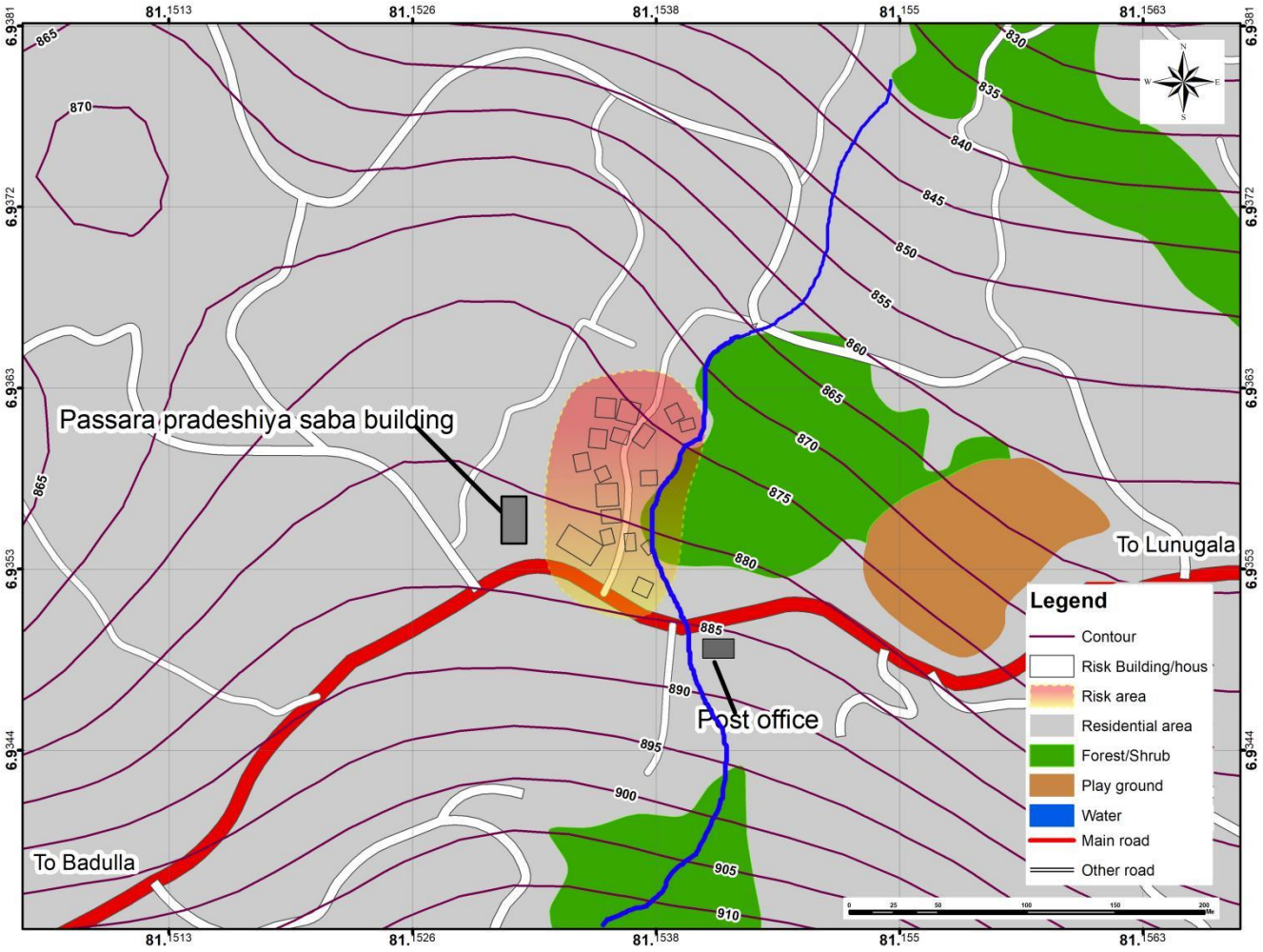


Figure 4: Google image, cross sections, land use and risk elements of the location

4. Description of the area of the landslide/slope failure and areas adjacent to the landslide and current level of risk

4.1 Area of the landslide

The unstable area is a sloppy sub-urban area with settlements and commercial buildings beside the road. A partially constructed market center building is located within the unstable area. Fourteen (14) houses are located in the down-slope area, on both sides of the concrete-paved road running to the down-slope area. A stream is flowing at the down-slope area. A water tank is located within the unstable sloppy area, and water is used for domestic use (drinking and washing) by the nearby community. The tank gets water from excessive seepage of water in the area. The seepage is observed to create conditions favourable for progressive movement of the slope towards the stream at the toe area (creep). Two retaining walls are located on both sides of the concrete-paved road and it protects the concrete-paved road and houses located in this unstable area. Mixed vegetation with coconut trees, beetle, Jack, Avocado, and banana is identified in the area.
The affected road, the Peradeniya - Badulla - Chenkaladi highway (A5) is the only main access road to Passara area that provides access to the villagers. *(Ref. Fig.4: Images of the project area)*

4.2 Areas adjacent to the landslide

The surrounding area of the unstable slope section contains mostly sub-urban characteristics such as congested settlements, commercial buildings, government service-providing buildings, and other economic services. The small part of the western direction of the down-slope mitigation area consists of thick vegetation cover.

Refer Fig 5: Sensitive elements that may be affected by the project actions

4.3 Current level of risk

This slope instability can be activated again with the upcoming rains and there will be a possibility of occurring a massive landslide. The road will be collapsed and the entire households of the down-slope area are at risk. During the rainy season, it poses a high risk to commuters and vehicle transportation on the road due to the potential risk of slope failure. If the site is not rectified to prevent future failures, the slope failure with soil masses would disturb all functions of vehicle transportation between Badulla, Passara, and Lunugala towns. It would limit the continuous functions of the road between Badulla and Passara as this is the main access way to Passara town, the obstruction of accessibility may pose a significant impact on lifeline facilities, services, and related economic activities including the transactions.
The commuters, pedestrians, people, workers, and owners of the shops and their livelihood activities would be at risk due to this unstable slope section.

5. Description of the works envisaged under the project

Based on preliminary investigations, NBRO has carried out detailed investigations and designed suitable rectification measures to minimize the risk posed by this unstable slope section to ensure the safety of the commuters and the continued and uninterrupted function of this main road. The proposed activities include;

- Drainage management using surface, subsurface drainage, and horizontal drains
- Construction of a Gabian wall

Figure 5a: Existing retaining wall close to the house of Mr. R.D. Pradeep Roshan next to Pradeshiya Sabha land

Figure 5b: Existing retaining wall close to the house of Mr. R.D. Gayan

Figure 5: Images of the project area

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

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

i. Peradeniya-Badulla-Chenkaladi highway (A5)
ii. Concrete paved road runs through the site- access to houses
iii. Commuters and pedestrians
iv. Market Centre building complex under construction
v. Shops, services facilities, and small businesses
vi. Houses located on both sides of the road (14) and residents
vii. Water tank and the water supply pipe network (from the seepage)
viii. Water supply line of Pradeshiya Sabha
ix. Retaining walls
x. Stream flowing at the down-slope
xi. Current services, economic and tourism activities of the area

(Ref. Fig.6 Sensitive elements that may be affected by the project actions)

Figure 6a: Damaged road section of Peradeniya-Badulla-Chenkaladi highway (A5) Tension cracks are seen parallel to the road

Figure 6b: Cracks in the walls of the house of R.D. Pradeep Roshan -a high-risk house

Figure 6c: Common water tank in the down-slope area

Figure 6d: Pradeshiya Sabha market building (partially constructed)

Figure 6e: Damaged access road section and water supply line of Pradeshiya Sabha - Passara

Figure 6f: Shops in front of the damaged road section (A5 road)

Figure 6g: A small business place on the damaged road (A5) section

Figure 6h: Cracked concrete road to the down-slope area

Figure 6i: Stream flowing at the down-slope

Figure 6j: Two-storied building with a shop close to the damaged road section

Figure 6: Sensitive elements that may be affected by the project actions

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

7.1 Positive impacts

- The objective of this project is to ensure that further occurrence of slope failure/ landslide will be prevented to an acceptable level for the road section and down-slope houses. The Peradeniya-Badulla-Chenkaladi highway (A5) is the main access road to the hospital, school, police, court, post office, Pradeshiya Sabha, and the DSD office in Passara. The mitigation of this road will highly benefit the road users.
- The proposed project will significantly enhance the safety of the road for commuters, and pedestrians.
- The remediation may secure the cost of road rehabilitation from future ground subsidence in the area.
- Commercial activities besides the road and other lifeline activities of people in the area will be benefited largely from this mitigation.
- The risk houses (8 high risk & 5 moderate risk) and people will be benefited. They will not need evacuation and can live without fear.
- Continue development of the building can be considered after obtaining a technical report on the building.

7.2 Negative impacts

The mitigation works are generally confined to already failed land areas. Therefore, negative impacts are much localized and also limited to the construction period.

Table 1: Negative impacts and their level of significance

Impacts during the construction period	**Level of Significance**
7.2.1 Hydro-logical and water quality impacts	
7.2.1.1 Impacts of the drainage pattern of the area The mitigation works on this site will focus on drainage improvement. Disruption to existing surface and sub-surface drainage patterns in the area is envisaged with the project implementation. Therefore, during the rainy season heavy flow of water is expected to be generated and would be accumulated between the road and the slope. The water inundation of the existing drainage may be expected. An increase of water through the unstable slope may intensify the risk of slope failures of the unstable section.	**Highly Significant**

7.2.1.2 Water pollution and impacts on surface water quality During the slope excavation, the removal of debris can generate high sediment-laden run-off there could be a possibility that contaminated run-off may pollute the water of the Improper disposal of oils and other harmful substances/contaminants from machinery, leakages from temporary storage tanks, solid waste, and waste-water disposal/dumping could occur causing adverse impacts on the quality of the water. Further, during the rainy season, the rainwater running through the disturbed slope tends to pick up sediment, oil, and other pollutants generated during construction can contaminate the water of the stream.	**Highly Significant**
7.2.1.3 Erosion impacts and stream/ reservoir bed alterations The project activities will open the slope for surface erosion during the construction phase. The existing surface and sub-surface drainage pattern in the area will be disrupted during the construction phase. Therefore, the erosion impacts are highly significant due to the stream being located in close proximity to the mitigation area.	**Highly Significant**
7.2.1.4 Open defecation and water-borne infections As the site is located close to a stream and shrubs, the possibility of open defecation is high. Faecal contamination of the water of the stream or run-off water flow will be expected during construction due to open defecation of the contractor's workforce as the area consists of thick vegetation cover.	**Highly Significant** **Low**
7.2.1.5 Impacts on the downstream water uses The construction activities will be carried out on slopes with thick soil overburden consisting of both residual and colluvium soils. Therefore, the slope will be prone to erosion during the land clearing and land reshaping phase. This may increase the sediment load in the stream which at present has clean water, and affect the users at down-slope areas.	**Highly Significant**
7.2.1.6 Impacts on groundwater table and groundwater quality The addition or mixing of construction materials including cement, and grout materials with sub-surface water flows will cause temporary water quality degradation and accumulation of unwanted substances. During the construction period, the hazardous waste from chemical substances, waste water from the construction activities, and discharge of waste matter from on-site septic systems would cause adverse impacts on the groundwater quality as the water downstream may be used by the residents. Due to the mitigatory activities carried out in the slope area, the groundwater quality will be impacted or there will be a possibility for the groundwater table draw-down.	**Significant**
7.2.2 Environmental Impacts	
7.2.2.1 Noise and Vibration Impacts Noise and vibration are expected from construction equipment. The pedestrians and commuters on roads will also be affected by noise and vibration. The people of the nearby households will be exposed to high noise during heavy noise-generating activities, such as operating loading, and unloading of materials, and movement of machinery in addition to the above-mentioned construction works. During high machinery operation cracks could be formed as well as existing cracks in the houses could be enlarged.	**Highly Significant**
7.2.2.2 Air pollution impacts Construction activities that contribute to air pollution include land clearing, operation of diesel engines, demolition, and burning. Operating vehicles at high speed under dry weather conditions can increase such pollution. Improper handling and transferring of materials can also generate dust. Improper storage of materials can potentially generate dust if not properly covered. During construction, it generates high levels of dust typically from concrete, cement, wood, stone, and silica. The Badulla- Passara road is used heavily for vehicles moving (buses, bicycles, lorries, trucks, tippers, three wheels). Air pollution may have a significant impact on the community nearby, commuters, and pedestrians.	**Highly Significant**

7.2.2.3 Solid Waste disposal issues Haphazard disposal of solid waste; various types of waste such as litter, food waste, and construction waste will be generated and may be stored or disposed on site. The littering and haphazard storage and disposal of solid waste in and around the site will create inconveniences to the community, commuters and pedestrians. It can block the drainage to make breeding grounds for water-borne diseases. Waste can pollute the soil, and leave various environmental impacts if a proper disposal mechanism is not in place during the construction period.	**Highly Significant**
7.2.2.4 Explosive hazards and hazardous materials Since the affected area has rock boulders, explosives may be used if the rock blasting is envisaged. This may pose a risk due to unsafe use. As these operations are to be done on affected slopes the risk of improper use of explosives and accidents from rock fragments are highly significant.	**Significant**
7.2.3 Biological /Ecological Impacts	
7.2.3.1 Effects of Important Wildlife Habitats There are no forested/ wild-life reservation areas within the project influence area with high biodiversity.	Insignificant
7.2.3.2 Effects on Fauna & Flora The majority of the trees found in the area are not endemic, threatened, and identified in the red list of IUCN.	Insignificant
7.2.4 Social and Economic Impacts	
7.2.4.1 Impacts on agriculture within the area to be remedied/ immediately at the site There are home gardens immediately adjacent to the unstable slope area. During the construction period, this land use pattern may be affected by the disposal of spoil and debris or parking machinery and their oil leakages.	**Significant**
7.2.4.2 Cracks in the road and houses due to vibration impacts The A5 road and concrete paved access road running through the site are already cracked. Vibrations can create cracks in the roads further. Some houses are also cracked and prone to expansion due to construction works. During the construction heavy machinery will be used and the vibration can widen the cracks and may create new ones in the houses.	**Highly Significant**
7.2.4.3 Loosing access to land and future development activities The land where the project activities are envisaged belongs to Passara Pradeshiya Sabha, Badulla Maha Kataragama Dewalaya (under the Sri Lanka Buddhist Vihara Devala Foundation Act), and the road reservation of RDA. The mitigation works will be carried out in the road reservations of A5 road and the down-slope land of the road. Under the project, the land will not be acquired. The project will not result in loss to the landownership. The concrete paved road is the access to 14 houses in the mitigation area. During the machinery movement, and material transportation there may be disturbances to access to the houses in the mitigation area. The remediation works in the down-slope will increase the stability and protect the land from future failures. The market centre building will be affected during construction.	**Highly Significant**
7.2.4.4 Impacts on livelihood/ business and income activities The small business stole immediately adjacent to the unstable road section would be affected during the construction period. The transportation would be interrupted during construction phase. This would affect the livelihood of the community.	**Significant**

7.2.4.5 Impacts on service provision (water supply, sewage, electricity) The water supply lines could be impacted during machinery and material transportation.	**Significant**
7.2.4.6 Effect due to loss of infrastructure and safety During construction phase the main road from A5 road and concrete road to the down-slope area will be obstructed by frequently moving machinery, loaders, trucks etc. as the access road is very narrow. Heavy machinery, trucks and loaders can obstruct the pedestrian passage and cause traffic during peak times on the A5 road.	**Significant**
7.2.4.7 Work camps and lay-down site requirements The camps site will be selected in the neighbourhood of community. If proper camp management is not in place, it may result several labour issues, social issues with community, conflicts for shared resources with the community, nuisances, and management of waste etc.	**Significant**
7.2.4.8 Relations between workers and staff/ people living in the vicinity of the site and possibility of disputes The construction workers at this site will be from different social backgrounds and from different geographical areas often under poverty. Usually, they are with poor educational and social background. Such communities may have a wide range of social issues to cause dis-stress on the neighbouring community and the workers of the project. Although the workers who would engage in such issues will be rare, even few possibilities cannot be ignored.	**Highly Significant**
7.2.4.9 Workers safety during construction The workers may be exposed to risk from falling. Fatal injuries may occur if the slope fails. The risk of slope failure could be aggravated during the rainy season. This risk is highly significant. Risk of hazard from vehicle and construction machinery accidents is highly significant at this site. Contractor may engage under age workers (children) for construction work, which is risky and can results serious accidents and injuries.	**Highly Significant**
7.2.4.10 Safety to the public from construction activities: High risk for commuters During construction phase the road will be obstructed by the frequently moving machinery, loaders, trucks etc. As most of the mitigation works are to be carried out in limited space on slopes the heavy machinery, the trucks and loaders etc. can obstruct the commuter /pedestrian passage and may pose high risk on their life. The same risk at a high level will be there for the household's community located in down slope as they will be exposed to a longer duration to this risk during the construction phase. Therefore, the risk on them is highly significant.	**Highly Significant**
7.2.4.11 Impacts on transport infrastructure (especially temporary loss of road or rail access, risks of traffic congestion) The traffic due to full/partial road closure may obstruct the smooth flow of vehicles during the week days, in office hours, school times. This will cause nuisance to pedestrians and commuters	**Significant**
7.2.4.12 Areas used for businesses, agriculture or other within the area to be remediated There are some small business, shops and buildings are located within the area to be remediated. The vendors and the customers are directly affected during the constructing period, Therefore, the risk on them is highly significant.	**Significant**

7.2.4.13 Areas used for businesses, agriculture or other immediately adjacent to the site There is sub urban characteristics such as settlements, roads, business places, government buildings, shopping complex etc in the both up and down slope area immediately adjacent to the site. All of them may have some interruption during construction period.	**Significant**
7.2.4.14 Need for people to enter or cross the site Excavation machinery, loaders, trucks etc. will be used in the area used to access in to the unstable slope area. There is no special need for commuters and neighbouring community to enter the site for other purposes. Construction may use materials such as metal aggregates, steel etc. which can be injurious under improper storage and handling. However, unauthorized entry of ordinary people may occur due to intentional or unintentional purposes and they may be at risk due to operating machinery, vehicles, electricity, and may be blasting materials.	**Highly Significant**

8. Site Specific Risk Analysis

Table 2: Site specific risk analysis

Risk	Affected group	Risk level
1. Facing accidents when working close to the road	Workers	Very high
2. Transporting materials and machinery	Workers, Community nearby	Very high
3. Throw out disposals (litter, bottles, and food) to the construction site from the commuters.	Workers	Very high
4. Facing accidents during constructions at night time	Workers	Very high
5. Accidents from the construction activities and materials placed close to the road	Commuters	Very high
6. Injuries due to rock particles due to explosions/ blasting	Workers Commuters, Community nearby	Not relevant
7. Rock fall from the unstable area	Workers Commuters, Community nearby	Not relevant
8. Work with electrified supply lines	Workers, Community nearby	High
9. Site Working – Working in poor visibility	Workers Commuters	High
10. Lone Working	Workers	High
11. Emergency evacuation	Workers, Community nearby	High
12. Extreme weather conditions (wind, rain etc.)	Workers	High

9. Significant Environmental and Social Impacts

Environmental, social impacts or risks that will require special attention on the part of NBRO.

9.1 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 significant as the workers have to work on a unstable slope with a risk of falling. 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.

9.2 Child labour & forced labour

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

10. Environmental Social Management Plan (ESMP)

Measures to manage and or mitigate the impacts and risk. Especially the significant impacts and risks identified in sections 7 & 8. This section will include the specific recommendations and requirements of the ESMP for design stage, construction phase and maintenance operation phase.

10.1 Resettlement action plan

There will not be a project-based resettlement. However, there are occupied 9 houses identified as high risk and need resettlement. But continue living in the same location due to unavailability of safer lands in Badulla district for resettling. The instability could be activated with the rains and there should be a resettlement mechanism through the government.
Further, during the project actions these houses may have some impacts in the form of structural damage due to ground vibration induced by heavy machinery operation. During the heavy machinery works, the people should be evacuated with the consultation and coordination with divisional secretary Passara. Further, a scheme of compensation, in case of damage to structures due to project should be arranged.

10.2 Evacuation of people

Project based evacuations are required for this site for impacted houses considering the designs and construction methods. Because during the construction, some activities could affect the houses and residents. Suitable evacuation plan to be implemented with consultation Divisional Secretary, Chairman, Pradeshiya Sabha to reduce the impact of people during construction. A scheme of compensation, to cover the rental (monthly payment for tenants during stay in rental houses) and any other expenses during evacuation due to project should be arranged.

10.3 Procedure for removal of damaged structures, facilities infrastructure (consent from owners to remove the articles)

This risk may be triggered in this site.

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

This may be triggered in this site.

10.5 Public awareness and education- needed for following areas

i. Programs to inform and educate people in the vicinity and the shop owners about the risks posed by unstable land section
ii. Requirement for special awareness for nearby community, commuters and the people passing through the area using the road with potentially high-risk during construction phase and early warning.

10.6 Design based Environmental/ Social Management considerations

The site is located in an aesthetically beautiful, environmentally sensitive natural environment in the rural set-up. Hence, following environmentally and socially significant design considerations are recommended.

Table 3: 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 minimum number of removals of grown tree species. Sufficient emphasis should be made to consider conservation of trees if important tree species are found.	High
ii. Site Planning During site planning it is necessary to be cautious on possible re-activation of landslide The vehicle parking sites, material storage and temporary shelters etc. should not be installed in the danger zones of the slides. It is very necessary to keep trained flagman or safety officer during the construction period and proper communication between contractor's workforce and the other responsible officials should be maintained.	Very High
iii. Habitat connectivity and animal trails If large fractions of vegetation are required to be cleared in ecologically fragile habitats as 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 impacts are localized.	Low
iv. Conservation of water resources If 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 .	High
v. 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. Also, there is a common water tank located in the site providing water for the down slope area. In such instances the design should include alternative source of water for the community (temporary/or permanent).	High
vi. 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
vii. Consideration of green environmental features As many of the mitigatory 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 & etc.	High
viii. Conservation of social and Cultural features The local cultures and heritages are strengthened by their close connections to the natural environment that sustains them. Therefore, the project actions should be carried out considering local culture and social aspects, providing opportunities to reinforce them during the project actions.	High
ix. Workers/ commuters and community safety Unauthorized entry and ignorance may cause severe accidents around the site. Activation of slides or ground subsidence may occur during construction phase and may pose threat to workers, passengers and commuters. Therefore, design-based safety consideration such as beams, safety nets etc. should be considered.	Very high

x. Erosion control structures In drainage management, water is extracted and conveyed to nearby stream often through culverts. During the rainy season the flow in these drainage structures can be significantly high and this may cause stream bed 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.	High
xi. 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, and sediment trapping systems etch should be considered if drain water is expected to be directed to natural streams. The materials used for structures should be chosen carefully to withstand weather conditions with high durability. Designs should especially consider corrosion prevention techniques if steel structures are used.	Very High

10.7 Mitigation of impacts during the construction phase

10.7.1 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 the construction contractor. NBRO has prepared a comprehensive document on "***contractors' requirement to comply with Environmental and Social Health and Safety (ES & HS) management during the construction phase"*** to be included in construction contractors' bid document. The main sections are summarized below (Table 4) indicating the degree of relevancy for this site. For details, ESMP for construction contractors should be referred.

Table 4: Contractor requirement to comply with ES & HS

Reference No. as per construction contractor's obligation to ESMP	Item	Relevant to the project
2002. Environmental and Social Monitoring		
2002.2 1)	Storage on site	Highly Relevant (road reservation, residents)
2002.2 2)	Noise and Vibration	Highly relevant (commuters, pedestrians, community nearby)
2002.2 3)	Cracks and damages to the buildings	Relevant
2002.2 4)	Disposal of waste	Relevant (community nearby)
2002.2 5)	Disposal of refuse	Highly relevant (road reservation)
2002.2 6)	Dust control	Highly Relevant (commuters, pedestrians)
2002.2 7)	Transport of Construction materials and waste	Relevant (commuters, pedestrians, community nearby)
2002.2 8)	Water	Relevant
2002.2 9)	Flora and Fauna	Less Relevant
2002.2 10)	Physical and cultural resources	Not 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	Highly relevant (community nearby)
2002.2 17)	Utilities and roadside amenities	Highly relevant (road, water lines)

2002.2 18)	Visual environment enhancement	Highly relevant (Aesthetically sensitive road section)
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	Refer site specific monitoring plan
	Reporting and maintenance of records	Relevant
2003. Working Conditions and Community Health and Safety		
2003.2	Safety organization and communication	Highly relevant (unsafe slope, commuters, heavy machinery)
2003.3	Child Labor and Forced Labor	Relevant
2003.4	Safety reports and notification of accidents	Highly relevant
2003.5	Safety Equipment and Clothing	Highly relevant
2003.6	Safety inspections	Highly relevant
2003.7	First Aid Facilities	Highly relevant
2003.8	Health and safety information and training	Highly relevant
2003.9	Plant equipment and qualified personnel	Relevant

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 implemented if needed only*
Refer site site-specific monitoring plan*: The contractor is obliged to carry out monitoring as specified in the site-specific monitoring plan*
Reference: Contractors' Obligation for implementation of ESMP

10.7.2 Site Specific mitigation

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

Table 5: Site-specific ES & HS mitigation measures

Mitigation item	Project implementation phase	Responsibility
i. Minimize erosion impacts during construction It is recommended that mitigation works involved with site clearance, slope reshaping, removal of debris etc. are avoided during rainy season. Therefore, it is imperative that site works in down-slope mitigation are carried out in the dry season and avoid such activities on up-slope area in the wet season as much as possible. This should be considered in the project planning stage. Silt traps should be introduced to cut down sediment-laden run-off.	Site preparation & construction	Construction Contractor
ii. Invasive species Should be avoided in using vegetative erosion control structures. Native plants in the local environment should be chosen for vegetative control. The species used for vegetative control measures need approval from the Department of Wildlife Conservation & Department of Forest.	Construction	Construction Contractor

iii. Impacts on transport infrastructure (especially temporary loss of road or rail access, risks of traffic congestion) A good traffic control should be implemented in the construction stage. As there is a bend on the road adjacent to the site proper road safety measures should be included with warning signs and permanent trained watchmen, luminous sign boards indicating slope instability risk and road obstruction signs, night lamps etc. are strongly recommended at this site.	Construction	Construction Contractor and
iv. Priority Health and Safety Issues As the workers on the site have to work in high-risk conditions, it is imperative to implement recommendations given in section 2003 of contractors' obligation on ESMP under "working conditions and community health and safety". These recommendations should be followed carefully in a proper organization and safety monitoring system. i. Prepare a special Occupational Health and Safety Management Plan prior to the commencement of construction activities ii. A good warning system and full-time watchmen is highly recommended for this site for both worker and commuter safety. iii. Safety barriers and safety nets should be installed at places of risk to protect workers and commuters from boulder falling risk Adoption of standard worker safety methods iv. Provision of personal protective equipment (PPE) such as safety boots, helmets, protective clothing goggle etc. v. Provision of training and awareness programs to employees vi. Conducting hazard analysis and plan/provide adequate mitigation measures for such hazards identified, prior to carrying out major construction activities vii. If the wasp nest is in the vicinity, it is mandatory to use Evacuation Centers for ensure of workers' safety viii. Additionally, work should be discontinued for sufficient time period during rainy period as working on unstable land will be highly risky in the rainy season	Construction	PMU Construction Contractor
ix. Throw out disposals (litter, bottles, and food) to the construction site from the commuters. Put up the safety sign boards prior to the construction site indicating people at work. The commuters should be aware about the construction activities through notices erected before reaching the proposed mitigation site.	Site preparation & construction	Construction Contractor
x. Minimize erosion impacts during construction It is recommended that mitigation works involved with site clearance, slope reshaping, removal of debris etc. are avoided during rainy season. Therefore, it is imperative that site works in slope mitigation are carried out in the dry season and avoid such activities on slope area in the wet season as much as possible. This should be considered in project planning stage. Silt traps should be introduced to cut down sediment laden runoff.	Site preparation & construction	Construction Contractor

xi. Disposal of construction waste The contractor should pay special attention with respect to disposal of construction waste. This site is located close to a main road. Also, this main road is used by many people. Stream is flowing through the site and water seepage and water storage tank are available in the area. Therefore, such waste if generated should store properly without getting washed off and dispose according to approved procedures by the PMU. Construction waste should not dispose along the road or into the drainage.	Site preparation & construction	Construction Contractor
xii. Impact on down slope water users Stream is flowing at the down-slope of the unstable slope. The construction activities may pollute the water flowing. It would have a significant impact on the down slope water users.	Site preparation & construction	Construction Contractor
xiii. Onsite sanitary facilities for the workers The contractor should prepare temporary sanitary facilities for the workforce within the site, to mitigate open defecation of the workers.	Site preparation & construction	Construction Contractor
xiv. Dust and aerosol control screens Dust particles generated during the construction period can influence the commuters. The commuters traveling in the Badulla Passara main road could be affected from generated dust particles. Special screens etc. should be used if heavy dust or aerosol generating activities are envisaged.	Site preparation & construction	Construction Contractor
xv. Water for construction Water for construction works should be obtained only from the approved sites.	Construction	Construction Contractor
xvi. Working hours The construction activities should be restricted to day time only. Working after 6.p.m. is not recommended for any reason due to safety issues.	Construction	Construction Contractor
xvii. Impact on service infrastructure Telecommunication, electricity, water lines should be relocated before construction starts as per the approval of PMU.	Construction	Construction Contractor
xviii. Need for people to enter or cross the site Possible unauthorized access to the site should be avoided by awareness, warning signs and vigilance by the contractor's full-time watchmen.	Construction	Construction Contractor
xix. During construction good housekeeping should be maintained to minimize visual pollution	Site preparation & construction	Construction Contractor
xx. Worker's code of conduct Possible disputes between the labor force and the commuters and tourists should be prevented by maintaining the agreed code of conduct by the contractor. Possible disputes between workforce and commuters should be avoided especially when using shared resources such as common bathing and washing places etc.	Construction	Construction Contractor
xxi. Snake bites management and emergency management by accidents Proper emergency management systems for snake bites (including awareness of snake bites, safety shoes while at work, first aid on a snake bite, hospitalization, and admission to the correct hospital where snake bite management facilities are available) should be introduced. Accidents are common on these kinds of sites. Proper emergency management unit for other accidents (first aid facilities, safety items,	Construction	Construction Contractor

hospitalization facilities, and transportation facilities) should be maintained for this site.		
xxii. The occupants in the houses identified as high risk by the NBRO People in moderate areas to be vigilant about the changes in the ground instability. Should be alerted on NBRO warnings during rainy days. Currently, operating warning dissemination procedures should be strengthened to ensure that occupants are responsive to alerts. The Environmental and Social unit of PMU should take to step to implement a response mechanism.	Construction	E & SU of PMU
xxiv. Resettlement action plan There are occupied 9 houses identified as high risk and needing resettlement. If the resettlement is not implemented, a scheme of compensation, in case of damage to structures due to the project should be arranged.	Construction	E & SU of PMU
xxiii. Evacuation Project-based evacuations are required for this site for impacted houses considering the designs and construction methods. A suitable evacuation plan is to be implemented with consultation the Divisional Secretary, Chairman, Pradeshiya Sabha to reduce the impact of people during construction. A scheme of compensation, to cover the rental (monthly payment for tenants during their stay in rental houses) and any other expenses during evacuation due to project should be arranged.	Construction	E & SU of PMU
xxiv. Market Centre -Pradeshiya Sabha Construction activities should not affect the structure of the building. If the building is used for material storage, approval from Pradeshiya Sabha should be taken. Use of buildings during rainy season for the above purpose to be restricted. Since the building is damaged, it should not be used as a resting place, changing clothes, etc for workers. A strict Code of conduct should be followed by the contractor's workforce if the building is used for the material storage.		

10.7.3 Monitoring 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. 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 6: Environmental and Social monitoring plan; construction phase

Monitoring requirement	Parameters	Frequency
i. Baseline monitoring	Water quality	Once*
	Pre-construction crack survey of the houses in the immediate area	Once*
	Ground vibration	Once*
	Air quality: particulate matter	Once*
	Background noise measurement	Once*
ii. During construction	Water quality (common tank)	If noticeable water quality impairment due to construction activities
	Crack survey for the risk buildings	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	Once a month during heavy noise generation times *
	Air-quality particulate matter	Once a month *
iii. Vehicular Emission	All machinery/vehicles operation 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 National Environmental (ambient water quality) regulations, no.01 of 2019 **Pre-construction crack survey of the high-risk buildings**-Professional report form a charted structural engineer **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.	

11. Labour management

Sound worker-management relationships, treating workers in the project fairly and providing safe and healthy working conditions is required. Responsibility is lies with the PMU and the construction contractor.

The Objectives are;

- To promote safety and health at work.
- To promote the fair treatment, nondiscrimination and equal opportunity of project workers.
- To protect project workers, including vulnerable workers such as women, persons with disabilities, children and migrant workers, contracted workers, community workers and primary supply workers, as appropriate.
- To prevent the use of all forms of forced labor and child labor.
- To support the principles of freedom of association and collective bargaining of project workers in a manner consistent with national laws.
- To provide project workers with accessible means to raise workplace concerns.

12. Preventive measures for COVID-19 that was issued by Sri Lankan national health authority (this is applicable if Notification on Covid -19 epidemic/ endemic is issued by Health Authorities Sri Lanka)

COVID-19, the novel corona virus infection has not been totally eradicated in the world. Therefore, to prevent/ control of the spread of infection also to prevent pandemic situations in the event of detecting a suspected case, all contractors are required to develop a COVID-19 Preparedness plan and need implementing in the site as per the "Health and Safety Guidelines for Sri Lankan Construction Sites to be adopted during COVID 19 outbreak" Guidelines given by Construction Industry Development Authority CIDA 29th April 2020.

13. Public and Stakeholder Consultations -the public consultations that have been and/or will be held

13.1 Public Consultations

The eight damaged houses were visited during the field visit and residents were made aware on the mitigation project and the funding mechanism. They stated that the mitigation works are appreciable and expressed their willingness to the project.

13.2 Stakeholders involved in the consultations any recommendations or agreements reached in the consultations (Refer to annex II)

Mr. D. M. Wasantha Kumara, the Disaster relief officer and Mr.H.T. Amaradasa, Grama Niladhari – 88/B, Passara North division of the Passara Divisional Secretariat was informed about the project works.

Mr. S.S. Hennayaka, Executive engineer, RDA office Badulla was informed about the project works.

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

Table 7: Clearances, no objection, consent and approvals

Requirement / Approval / Institution	Relevance to the project
14.1 Project implementation	
Approval from the District Secretariat	The approvals will be required and the proposals need to be presented at the District Coordinating Committee, in which the 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 issues will be discussed at this meeting. The issues arrived will be addressed in the ESMP, the decisions and recommendations taken up at this meeting will be considered in the ESMP.
Approval from the planning committee	The approval from the planning committee of the Passara Pradeshiya Sabha.
14.2 Approval from the state lands owners relevant to the project	
Central Environmental Authority	Consent from the District Central Environmental Authority is required.
Department of Forest Department of Wildlife Conservation	As there is no forest reservations and wildlife habitats; Department of Forest and Department of Wildlife Conservation approvals are not needed
Geological Surveys and Mines Bureau	Approval will be obtained for extraction of materials, transportation and disposal of earth, rocks and mineral debris. (If necessary, only).

Passara Divisional Secretariat	Approvals from Passara Divisional Secretariat will be obtained for the disposal of waste and plant litter.
Ceylon Electricity Board	Approvals from regional office of Ceylon Electricity Board will be required for power supply for site operation.
National Plant Quarantine Service	Approval from Additional Director National Plant Quarantine Service Katunayake for Director General of Agriculture under the Plant Protect Act No. 35 of 1999 Plant or seed if needed for bio–engineering purpose.
14.3 Consent/ no objection/ legally bound agreement from the private land ownership	
Land owner (RDA & private lands)	Signing a legally bound agreement between the land owner and the project implementing authority allowing no-objection to remove the structures, access the land, implement construction works, and engage in long-term maintenance works

The tentative time line for getting approval is given in the table 7.

Table 8: Tentative time-line 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 RDA Submission of application Respond to comments Approvals								
Other approvals GSMB Ministry of Defense (Depends on the requirement)								
Consent/ no objection from the land ownership								

15. Grievance redress mechanism for this site

The PMU ES officer is responsible for establishing the grievance redress mechanism for this site for impact communities. *(Reference: Environmental and Social Management Framework for recommended procedure for establishment of grievance redress mechanism).*

16. 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 9: Proposed scheme of information disclosure

Information	Proposed agencies	Mode of information disclosure
i. Project plan (site details, design, implementation arrangements)	District CEA, District Secretariat, Divisional secretary, RDA, 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, AIIB,	Meetings, District Coordination Committee, submission of relevant report to sign agreements, approvals and consents
iii. Monitoring reports (baseline and during construction)	District CEA, 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, 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 and progress review meetings pertinent to ES matters	District CEA, 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 10: Level of information gathered through consulting institutions

Date	Institution	Person contacted for information
23.06.2024 (Through the phone)	Divisional Secretariat Office - Passara	Disaster Relief Officer Mr. D.M. Wasantha Kumara
12.11.2024	Grama Niladhari – 88/B, Passara North division	Mr. H.T. Amaradasa
12.11.2024	Executive engineer, RDA office Badulla	Mr. Hennayaka Engineer

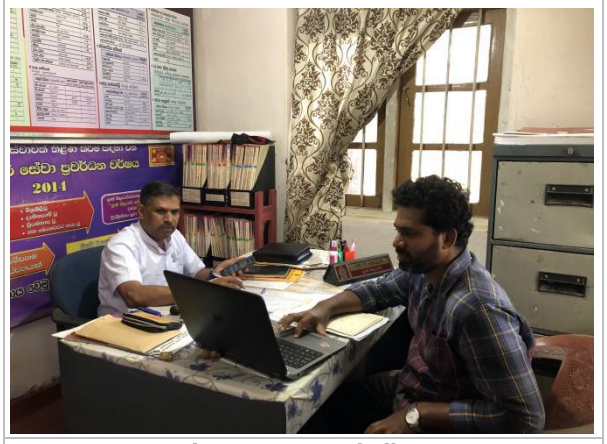
Annexes I: Images of the site condition and the consultation

Consultation with the residents (Mr. R.D. Pradeep Roshan) in risk area

Consultation with the residents (Ms. N.G. Somawathi) in risk area

Consultation with the residents (Mr. R.D. Gayan) in risk area

Consultation with Mr. S.S. Hennayaka, Executive engineer, RDA office Badulla



Mr.H.T. Amaradasa, Grama Niladhari – 88/B, Passara North division of the Passara Divisional Secretariat

Annexes II: Report on the Stakeholder Consultation: Badulla District

Institution	Name and designation of the contact officer	Concerns raised
Central Environmental Authority	Provincial Director, Central Environmental Authority Central Province.	✓ Under the Soil Conservation Act 25 of 1951 of National Resource Management Centre, Badulla District has been gazetted as a sensitive area. ✓ Under this gazette any development is not allowed irrespective of the magnitude of the project. ✓ In a disaster this is not needed. ✓ Landslide mitigation projects are not considered projects prescribed in the Gazette. ✓ The Basic Information Questionnaire (BIQ) is needed to fill for the project and submit the application ✓ As the proposed project (mitigation) intends to reduce the risk from landslide for an emergency action CEA approval is not needed considering the priority of the project. ✓ Before project commence a request indicating the mitigation sites need. ✓ If the project is carried out in a sensitive area, even not within a prescribed project, consideration of sensitive area will govern the process.
Road Development Authority	Chief Engineer	✓ This area is under the jurisdiction of Badulla District RDA office ✓ The RDA has no objection and states the mitigation is very much needed. ✓ Other concerns raised • A proper handing over of the project is required after the mitigation • RDA will do the maintenance after mitigation • It is emphasized that during the construction the contractor should use Personal Protective Equipment • At all times, the contractor shall provide safe and convenient passage for vehicles, pedestrians, and traffic safety measures, barricades, flagmen and for the night work, lights and illumination should be provided. ✓ It is also stated that Construction waste/ excavated materials should not be a nuisance to public/commuters

Annexes III: Proposed procedure for obtaining approvals from state land owners and environmental agencies.

1. **Proposed procedure by RDA for approval for implementation of landslide mitigation projects in RDA reservation areas**
   i. The design to be accepted by the RDA: The project implementing agency should submit detailed design report to RDA with a formal request on nature of approvals required. PMU should prepare above documents and should submit the documents to RDA regional office.
   ii. RDA regional office will evaluate the proposal and may call for project briefing. The PMU should provide necessary briefing as appropriate
   iii. On the approval by RDA an agreement will be signed between RDA and Project implementing agency to access the site, erect structures, and implement mitigation works.
   iv. A condition that would include is
      - A proper handing over of the project is required after the mitigation
      - RDA will do the maintenance after mitigation
      - It is emphasized that during the construction the contractor should use Personal Protective Equipment
      - At all times, the contractor shall provide safe and convenient passage for vehicles, pedestrians, and traffic safety measures, barricades, flagmen and for the night work, lights and illumination should be provided.

- Construction waste/ excavated materials should not be a nuisance to public/commuters

Annexes IV: Study team

Name	Designation	Position in the study
SAMS Dissanayake	Senior Scientist/ESSD/NBRO	Senior Environmental Scientist
Prabath Liyanaarachchi	Scientist/ ESSD/NBRO	Environmental scientist, GIS/ Demographic data collection /survey, Report preparation
Asanka Sanjaya	Field Assistant	Assistant - data collection for the SSESMP
Ranil Jayawardhana	Field Assistant	Assistant - data collection for the SSESMP

Annexes V: List of references

1. Contractor's obligations for Generic Environmental and Social Management Plan- Sri Lanka Landslide Mitigation Project- RLVMMP
2. Environmental and Social Management Framework-Sri Lanka Landslide Mitigation Project - RLVMMP
3. Resettlement Planning Framework- Sri Lanka Landslide Mitigation Project -RLVMMP
4. Felling Trees (Control) Act by Ministry of Agriculture, Rural Economic Affairs, Livestock Development, Irrigation and Fisheries and Aquatic Resources Development
5. Census and Statistical Report (2012), Department of Census and Statistics