



REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES PROJECT

Site Specific Environmental and Social Management Plan

Site No. 242

Unstable and Failed Slopes at Dharmaraja College Premises – Kandy

Kandy District

May 2026

Prepared for:



**ASIAN INFRASTRUCTURE
INVESTMENT BANK**

Prepared by:



National Building Research Institute
99/1, Jawatta Rd | Colombo 05
Tel: 011-2588946, 011-2503431, 0112-2500354

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
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 unstable and failed slope sections	6
4.2 Areas adjacent to the unstable slope	7
4.3 Current level of risk	7
5. Description of the works envisaged under the project.....	8
6. Brief description on the surrounding environment with special reference to sensitive elements that may be affected by the project actions	8
7. Identification of social and environmental impacts and risks related to the works	11
7.1 Positive impacts.....	11
7.2 Negative impacts.....	11
7.2.1 Hydrological and water quality impacts	11
7.2.1.1 Impacts of the drainage pattern of the area	11
7.2.1.2 Water pollution and impacts on surface water quality.....	11
7.2.2 Environmental Impacts	12
7.2.2.1 Noise and vibration impacts.....	12
7.2.3 Biological /Ecological Impacts	13
7.2.4 Social and Economic Impacts	13
7.2.4.8 Relations between workers and the school children / staff / people living in the vicinity of the site and possibility of disputes	13
8. Site Specific Risk Analysis.....	14
9. Significant Environmental and Social Impacts.....	15

9.1 Priority Health and Safety Issues. Specific H&S concerns that require measures that go beyond the standard contractual requirements for contractors.....	15
9.2 Child labour & forced labour	15
10. Environmental Social Management Plan (ESMP).....	15
10.1 Resettlement action plan	15
10.2 Evacuation of people.....	15
10.3 Procedure for removal of damaged structures, facilities infrastructure (consent from owners to remove the articles).....	16
10.4 Requirement for compensation for loss of property /uses due to project actions	16
10.5 Public awareness and education- needed for following areas	16
10.6 Design based Environmental/ Social Management considerations	16
10.7 Mitigation of impacts during the construction phase.....	17
10.7.1 Construction contractors' requirement to comply with environmental and social management during the construction phase	17
10.7.2 Site Specific mitigation.....	18
10.7.3 Monitoring requirements specific to the site	22
11. Labour management	23
12. Public and Stakeholder Consultations -the public consultations that have been and/or will be held.....	23
12.1 Public Consultations	23
12.2 Stakeholders involved in the consultations any recommendations or agreements reached in the consultations (Refer annexure II)	24
13. Clearances, no objection, consent and approvals required for the implementation of the project.....	24
13.1 Project implementation	24
13.2 Approval from the state lands owners relevant to the project	24
13.3 Consent/ no objection/ legally bound agreement from the private land ownerships	24
14. Grievance redress mechanism for this site	25
15. Information disclosure	25

List of Annexures

Annexure I: Images of the site condition and the consultation	i
Annexure II: Report on the Stakeholder Consultation: Kandy District	i
Annexure III: Study team.....	i
Annexure IV: List of references.....	i

List of Figures

Figure 1: Road map showing the accessibility to the site	2
Figure 2: Google image of the proposed landslide mitigation site, the surrounding environmental features and service infrastructure.	2
Figure 3: Google image, land use, risk elements and the photographs of special features of the location..	5
Figure 4a: Location 1; Damaged road and the downslope of the access road	8
Figure 4b: Location 1; Upslope area of the access road	8
Figure 4c: Location 1; Main entrance to the school.....	9
Figure 4d: Location 1; Both up and downslope	9
Figure 4e: Location 2 ; Cricket practicing net of the ground.....	9
Figure 4f: Location 2; unstable slope behind the cricket practicing net	9
Figure 4g: Location 3 ; failed slope located between the staff room, the physical fitness center.....	9
Figure 4h: Location 3 ; Cracks in physical fitness center	9
Figure 4i: Location 3; Cracks in physical fitness center wall	10
Figure 4j: Location 3; Bamboo tree near the physical fitness center	10
Figure 4k: Location 4; Unstable slope located behind the Grade 8 and 9 classroom building	10
Figure 4l: Location 4; Grade 8 and 9 classroom building.....	10
Figure 4m: Location 5; unstable upslope area situated behind the school's aesthetic building.....	10
Figure 4n: Location 6; failed slope located behind the Science Section building	10
Figure 4p: Location 7; unstable slope located behind the dental center building	11
Figure 4q: Location 8, Slope behind the swimming pool complex of the school.....	11

List of Tables

Table 1: Failed and unstable locations in the school premises	3
Table 2: Negative impacts and their level of significance	11
Table 3: Site specific risk analysis.....	14
Table 4: Design stage Environmental & Social considerations	16
Table 5: Contractor requirement to comply with ES & HS	17
Table 6: Site specific ES & HS mitigation measures.....	18
Table 7: Environmental and Social monitoring plan; construction phase	23
Table 8: Clearances, no objection, consent and approvals.....	24
Table 9: Tentative timeline for getting approvals	25
Table 10: Proposed scheme of information disclosure	25
Table 11: Level of information gathered through consulting institutions.....	26

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
GND	Grama Niladhari Division
GOSL	Government of Sri Lanka
GSMB	Geological Surveys & Mines Bureau
NBRI	National Building Research Institute

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 implementation in accordance with environmental and social safeguards and mandates of the AIIB and those of Sri Lanka. Considering the nature of project actions and their 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 (NBRI) 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 minimal.

During the scoping exercise, it was revealed that the environmental & social setting, and health & safety conditions are more site-specific, and need to be addressed specifically to site conditions. Therefore, the ESMF has recommended a site-specific environmental and social assessment 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 **Unstable and failed cut slope areas at Dharmaraja College Premises - Kandy** 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 landslide mitigation design team, the PMU and the contractor in the implementation of Environmental and Social Management component of the project. The SSE & SMP is published 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 242, Kandy District, for **Unstable and failed cut slope areas at Dharmaraja College Premises - Kandy**

2.2 Location details

The proposed mitigation site falls under Ampitiya South GN division of Kandy DS division, Kandy District, Central Province.

GPS references of the site– 7.288287°N and 80.650381°E

Nearest town and accessibility to the site

Kandy town is about 4 km from the site. The site can be accessed via Dharmaraja Mawatha from Kandy (Ref. fig. 1)

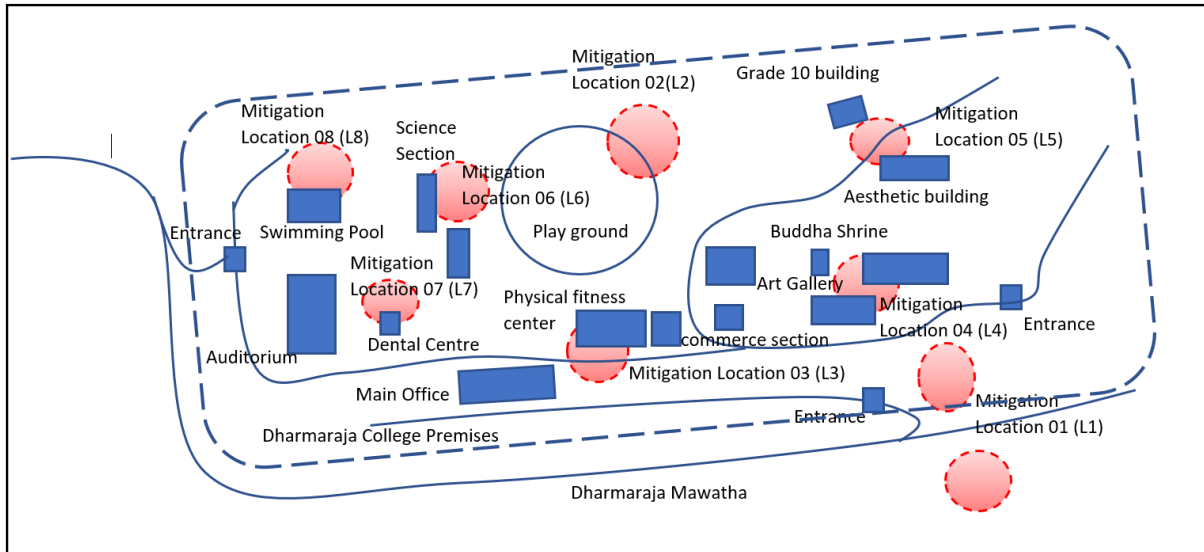


Figure 1: Road map showing the accessibility to the site

2.3 Topography and land ownership

The proposed mitigation site is located within Dharmaraja College premises in Kandy District. The school has 4295 total student population of 4295 (all male) with 216 academic staff (female – 175, male 41) and 61 non-academic staff (female – 34, male – 27). The entire land area of the school is 36 acres. Eight unstable and failed slope locations can be identified within the entire school premises. Since the college area spreads over “half of the Dharmaraja hill” and covers a large hilly area, the elevation within the college premises itself likely varies roughly between 500 m to 650 m above sea level. The land ownership of the school premises is the Department of Education. Refer to figure 2, 3; Google image of the proposed landslide mitigation site, the surrounding environmental features and service infrastructure.



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

2.4 Meteorology of the area

Annual Rainfall Range – 1,700 mm – 2,000 mm

Average temperature range – 23.5°C – 24°C

(Source: <https://weatherandclimate.com>)

3. Landslide hazard incident details

3.1 Account of incident

The most recent occurrence of the landslides at these locations were occurred during 27th to 29th November 2025, coincident with Cyclone “Ditwah.” During this event, at the Dharmaraja College premises, few major slope failures were initiated at different locations of the school premises, and also unstable slope sections with collapsed walls and rock fall risk can be observed. The entire failed and unstable locations can be identified as follows.

Table 1: Failed and unstable locations in the school premises

Location No	Description	Type of the failure	GPS coordinates
L1	Up and down slope beside the access road to the school.	Failed and unstable Slopes	7.288287°N 80.650391°E
L2	Slope behind the boundary fence and cricket practicing net house of the playground	Unstable Slope	7.290480°N 80.649900°E
L3	Slope in between the staffroom, physical fitness center and commerce section building	Failed and unstable Slope	7.289037°N 80.649650°E
L4	Slope behind the grade 8, 9 classrooms (two story building) and art gallery building	Unstable slope	7.288757°N 80.650262°E
L5	Upslope of the school aesthetic building	Unstable Slope	7.289115°N 80.651459°E
L6	Slope behind the science building	Failed and unstable slope	7.290286°N 80.648567°E
L7	Upslope area of the school dental center building	Unstable Slope	7.290016°N 80.648284°E
L8	Slope behind the swimming pool complex of the school	Failed slope	7.290595°N 80.647963°E

All the failures were propagated from the up-slopes, directly affecting the downslope areas. Additionally, signs of ground instability have since emerged from the upslope area, extending toward the same facilities. These observations indicate that the surrounding terrain exhibits a high susceptibility to future slope failures, posing a continued risk to the school premises and activities. *Refer Fig 3: Google image, land use, risk elements and the photographs of special features of the location*

3.2 Effects and consequences of landslide

The Cyclone “Ditwah” in the month of November of 2025 disaster incident resulted in significant impacts to the entire country specially in Central and Uva provinces on the social life, environment and infrastructure facilities of the country. Most of the school premises which situated in hilly areas were damaged by the landslides and slope failures. Dharmaraja College at the Kandy also faced to this disaster. The collapsed soil mass moved downslope and reached to the school other buildup areas, disrupting regular activities and posing an increased safety risk to students and staff. Ground deformations and continued instability in the upslope areas in several locations have further limited the use of nearby spaces due to concerns of additional failures. Although the event caused notable damage to the boundary walls, swimming pool, science building classrooms and retaining walls and interruption to school operations, no casualties or damages to the students and staff were reported during the incidents. However, the high susceptibility of the area to recurring slope failures continues to present a hazard to the school community, necessitating ongoing monitoring and mitigation measures.

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

After the Ditwah, at two mitigation locations (L1 and L6), were covered with Tarpaulin, to reduce the potential risk of the area as part of the remedial measures and no any remedial measures taken to other mitigation sites.

3.4 Evacuations

No any evacuations have been undertaken due to the potential risk.

3.5 Resettlement (progress)

There is no requirement of project-based resettlement programme for this site.

Mitigation sites located in Dharmaraja Collage Premises – Kandy

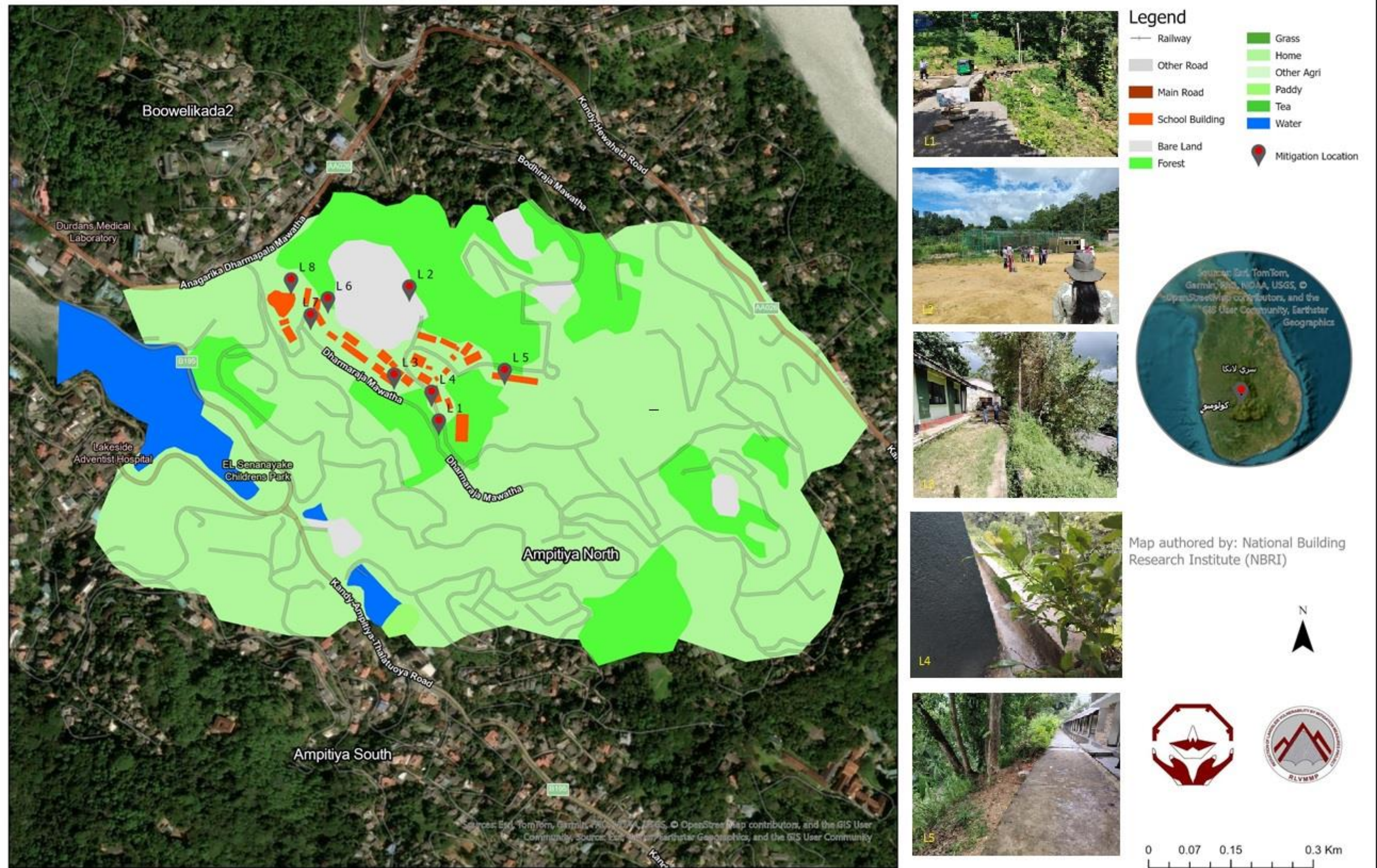


Figure 3: Google image, land use, risk elements and the photographs of special features of the location

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 unstable and failed slope sections

The unstable and failed slope sections are located within the Dharmaraja College premises – Kandy. Eight unstable and failed slope areas can be identified within the school premises. All the slopes have an average inclination close to 35 – 40 degrees, classifying them as a very steep and highly unstable geomorphological setting. Following descriptions provide the area specific details of eight locations.

Location 1 consists of failed slopes on both sides of the access road leading to the school. Tensional cracks are visible on the upslope area, indicating ongoing instability. Vegetation cover, including grass and tree species such as Jack and Mango, can be observed on the unstable upslope. Large rock boulders were detached and now rest on the upslope side of the road, while the displaced soil mass has accumulated on the roadway. Water seepage is also observed flowing from the upslope ground through the road surface. In addition, a portion of the road has been damaged due to the downslope movement of the collapsed soil mass. This location remains highly unstable and continues to pose a significant risk. (Approximately this access road have been used 2000 persons including students, teachers, parents, villagers and more than 600 of vehicle fleet daily)

Location 2 is an unstable slope situated behind the cricket practice net house and the school boundary fence. Approximately 60 students (male) and 5 teachers (female 2, male 3) and coaches (male) have been used this affected area. A container box, which was previously used as a football equipment storage facility, is located near the unstable area. At present, both the cricket practice net and the container box football center are not being utilized due to the hazardous condition of the site.

Several houses are located downslope of the school boundary fence in an area known as “Peris Waththa,” which belongs to the Ampitiya North Grama Niladhari Division. According to information provided by the school management, the school playground is rented out to external parties for various functions and sports events. The income generated from these activities is utilized for the maintenance of the school.

Location 3 is a failed slope located between the staff room, the physical fitness center (gym), and the Commerce Section building. The two-story Commerce Section building accommodates more than 250 students (male) and 2 coaches (male). The school staff room and the physical fitness center are situated on the upslope area, where large ground cracks and cracks on the building walls can be observed, indicating significant instability.

The drainage lines located between these buildings were damaged due to the slope failure. The unstable slope is currently covered with grass, and a bamboo bush is present at the top of the slope. In addition, electricity supply lines are running through the unstable slope area, increasing the potential risk. Due to safety concerns, the physical fitness center (gym) has been abandoned.

Location 4 is an unstable slope located behind the Grade 8 and 9 classroom building, which is a two-story structure, and the school’s art gallery building. Approximately 670 students (male) study in the Grade 8 and 9 section and nearly 15 teachers (11 female and 4 male) have been provided their service. During rainy periods, students are evacuated from the building due to the potential risk associated with the unstable slope. Ground cracks were observed in the area, and no proper drainage system is present at this location. The school’s art gallery room is also situated within the affected unstable slope area.

Location 5 is an unstable upslope area situated behind the school’s aesthetic building. The building contains separate music and dancing rooms and is considered historically significant, as it is more than 100 years old and was donated by Colombo Ananda College. Nearly 100 students (male) can be accommodated in this building and 5 teachers (4 female and 1 male).

The upslope area is covered with grass and tree species such as Mango and Avocado. Ground cracks were observed in the area, and cracks have also developed on the road leading towards the school hostel located at the downslope area, indicating ongoing ground instability.

Location 6 is a failed slope located behind the Science Section building. During the Dithwah disaster situation, the failed soil mass entered and accumulated within the classrooms. The building is a three-story structure consisting of classrooms, with nearly 140 students and 7 teachers (5 female and 2 male). No proper drainage system was observed at this location, which may further contribute to slope instability. At present, the failed slope has been covered with a polythene layer as a temporary measure to prevent further water infiltration into the slope.

Location 7 is an unstable slope located behind the dental center building. There is a water tank near the building, which is currently not in use. A nurse (female) works at the dental center on a daily basis, while a doctor (male) visits occasionally. The slope area behind the building is at risk of slope failure.

Location 8 is a failed slope located near the swimming pool complex within the school premises. During the disaster incident, the failed soil mass accumulated into the swimming pools. Although the pools have now been cleaned and are currently in use, a significant risk still remains. There are two swimming pools at this location. At present, the failed slope is covered with Mana grass to help stabilize the area. (Approximately 50-60 students including both male and outside female students and 2 or 3 coaches (male) have been used in this area)

4.2 Areas adjacent to the unstable slope

The unstable slopes are surrounded by several important school facilities, making the area highly sensitive to ground movement and slope deformation. A cluster of key infrastructure including school buildings, entrance road of the school, cricket practicing net of the ground, School physical fitness center, , Music and dancing rooms, staff rooms, dental center, swimming pool complexes lies close to the crest of the unstable sections.

These facilities are heavily utilized during school hours, meaning any progressive instability could pose immediate dangers to a large number of students. The slope next to the road demonstrates instability indicators, making access potentially hazardous for pedestrians and school vehicles alike. Overall, the presence of essential school buildings and heavily used student activity zones adjacent to the unstable slope significantly elevates exposure and risk, highlighting the urgent need for engineering stabilization and continuous geotechnical monitoring. *Refer Fig 3: Google image, cross sections, land use, risk elements and the photographs of special features of the location*

4.3 Current level of risk

The combination of non-engineering slope cutting for the main road, school buildings, inadequate slope protection, and proximity of structures increases the vulnerability of both the school and students. The saturated ground can become unstable, leading to small -scale soil slips, rock falls or more significant slope failures in certain areas. Any retrogressive movement of the slopes could directly affect these structures, resulting in severe damage and safety concerns for students and staff occupying the upper premises.

Overall, the combination of critical slope angles, structural loading from upslope buildings, and high student activity downslope contributes to the elevated risk level. This area requires urgent stabilization and continuous monitoring to ensure the safety of the school community and preserve the function of key facilities. If the site is not rectified to prevent future ground subsidence, the slope failure with soil masses would disturb all functions of the school. School children, staff and their educational and extra-curricular activities would be at risk due to this unstable section. The nearby houses and residents are also under the high risk.

5. Description of the works envisaged under the project

Based on preliminary investigations, NBRI has carried out detailed investigations and design of 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. Immediate slope stabilization measures, such as surface drainage control, vegetative reinforcement, and structural retaining solutions, are recommended to mitigate the risk to the school premises and adjacent communities. The proposed activities include.

- Earthworks including excavation and removal of soil mass
- Drainage management using surface and subsurface drainage network
- Further, in order to restore and retain the natural aesthetic outlook of this location, the protection works will essentially include nature-based surface protection solutions like turfing and planting.

6. Brief description on 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. School buildings
- ii. Entrance road of the school
- iii. Cricket practicing net of the ground
- iv. School physical fitness centre
- v. Music and dancing rooms
- vi. Staff rooms
- vii. Dental centre
- viii. Swimming pool complexes
- ix. Play areas of the school
- x. Students, academic and non-academic staff of the school activities
- xi. Current services and education activities of the school

(Ref. Fig.4 Sensitive elements that may be affected by the project actions)



Figure 4a: Location 1; Damaged road and the downslope of the access road



Figure 4b: Location 1; Upslope area of the access road



Figure 4c: Location 1; Main entrance to the school



Figure 4d: Location 1; Both up and downslope



Figure 4e: Location 2 ; Cricket practicing net of the ground



Figure 4f: Location 2; unstable slope behind the cricket practicing net



Figure 4g: Location 3 ; failed slope located between the staff room, the physical fitness center



Figure 4h: Location 3 ; Cracks in physical fitness center



Figure 4i:Location 3; Cracks in physical fitness center wall



Figure 4j:Location 3; Bamboo tree near the physical fitness center



Figure 4k:Location 4; Unstable slope located behind the Grade 8 and 9 classroom building



Figure 4l:Location 4; Grade 8 and 9 classroom building



Figure 4m:Location 5; unstable upslope area situated behind the school's aesthetic building



Figure 4n:Location 6; failed slope located behind the Science Section building



Figure 4p: Location 7; unstable slope located behind the dental center building



Figure 4q: Location 8, Slope behind the swimming pool complex of the school

Figure 4: 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 slope failures will be prevented to an acceptable level in Dharmaraja College - Kandy. The school buildings, playground, access roads, dental center and swimming complexes of the school premises currently at risk will be safe and the unstable areas of the school will be secured from future slope failures. The improved slope stability with the proposed structural mitigation will enhance significantly the safety of school population and its property.

7.2 Negative impacts

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

Table 2: Negative impacts and their level of significance

Impacts during the construction period	Level of Significance
7.2.1 Hydrological and water quality impacts	
7.2.1.1 Impacts of the drainage pattern of the area Disruption to existing surface and sub-surface drainage pattern in the area is envisaged with the project implementation. The mitigation works in this site will focus on the drainage improvement. Therefore, during rainy season heavy flow of water is expected to be generated and would be accumulated. The water inundation of the existing drainages may be expected. Increase of water through the unstable area may intensify the risk of ground subsidence of the unstable section.	Highly Significant
7.2.1.2 Water pollution and impacts on surface water quality During the excavations, removal of soil and debris can generate high sediment laden runoff there could be a possibility that contaminated runoff may pollute the water within the river flowing in the affected area. Improper disposal of oils and other harmful substances/contaminants from machineries, leakages from temporary storage tanks, solid waste and wastewater disposal /dumping could occur causing adverse impacts on quality of the water. However, during rainy season, the rainwater running through the disturbed area tends to pick up sediment, oil and other pollutants generated during construction can contaminate the runoff water.	Significant

7.2.1.3 Erosional impacts and stream 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 construction phase. Therefore, the erosional impacts are significant. Since there are no water streams close to the site, stream bed alteration impact will not be significant.	Insignificant
7.2.1.4 Open defecation and waterborne infections As site is located within a school premises, possibility of open defecation is very low.	Insignificant
7.2.1.5 Impacts on the downstream water uses Since there are no water streams close to the site, impact will be insignificant.	Insignificant
7.2.1.6 Impacts on ground water table and ground water quality Addition or mixing of construction materials including cements, 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 onsite septic systems would not cause adverse impacts on the ground water quality as there is no residential area nearby.	Insignificant
7.2.1.7 Impacts on water or wetlands There are no water streams close to the mitigation site	Insignificant
7.2.2 Environmental Impacts	
7.2.2.1 Noise and vibration impacts Construction noise is expected from machinery in site preparation and landscaping. This impact is significant as the construction is carried out in the proximity of the class rooms. The noise generated from the machinery will disturb the classes and other school functions. Hence the impacts of noise are considered highly significant at this site . If heavy machinery is operated the vibration can affect the school buildings and the buildings of church. As a result, structural deformations such as cracks and collapse of walls etc. may happen. Hence vibration impacts at this site are considered as significant . The pedestrians and commuters on road will also have an effect from noise and vibration	Highly Significant
7.2.2.2 Air pollution impacts Potential impacts on the air quality during the construction stage will be due to the fugitive dust and the exhaust gases generated in and around the construction site due to vehicular movement. Dust is a major component of air pollution, generated mainly from the following construction activities: Site clearance and use of heavy vehicles and machinery/equipment etc. Storage and handling of construction materials such as sand, cement, etc. and other gaseous emissions during construction result from: operating of construction vehicles, plant, and equipment. As the students in classrooms are in the close proximity to the location the air pollution impacts and dust fumes are significant. The effect is highly significant to school children if heavy air polluting activities are carried out during school hours. As the sensitive elements commuters, pedestrian etc. are in the close proximity the air pollution impacts from dust and fumes from the construction are highly significant.	Highly Significant
7.2.2.3 Solid waste disposal issues Haphazard disposal of solid waste; various types of waste such as litter, food waste, construction waste will be generated and may store or dispose on site. The littering and haphazard storage and disposal of solid waste in and around the site will create unaesthetic appearance to the railway commuters. Littering can block the water seepages and will make breeding grounds for mosquitoes. Waste can pollute the soil, and leave various environmental impacts if proper disposal mechanism is not in place during the construction period.	Highly Significant

7.2.2.4 Explosive hazards and hazardous materials Since the some slope areas have unstable rock boulders, explosives may be used if the rock blasting is envisaged.	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 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 Loosing access to land and future development activities The mitigation works will be concentrated within the school premises. There will not be significant impact to the land owner with regard to loosing access to the land or loss to valuable uses.	Insignificant
7.2.4.2 Impacts on agriculture within the area to be remedied/ immediately to the site There is no any cultivation immediately adjacent to unstable slope area.	Insignificant
7.2.4.3 Cracks in the buildings due to vibration impacts There are several school buildings located in the middle and upslope area proximity of the mitigation site. There are other school buildings also located in the school premises at different elevations. During the construction heavy machinery will be used and the vibration can cause cracks in these buildings and the effects are significant. Vibration can affect the stability of the nearby buildings immediate to the slope in the school.	Significant
7.2.4.4 Impacts on livelihood/ business and income activities There are no any livelihood/ business or income activities near the unstable area. The impacts are insignificant.	Insignificant
7.2.4.5 Impacts on service provision (water supply, sewage, electricity) There are water supply lines, sewage and electricity service provision near the unstable area. The impacts are significant.	Significant
7.2.4.7 Work camps and lay-down site requirements The work camps will be established closer to the site. Often the contractor rent out houses in the proximity. 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. If temporary camps are built in the close proximity of the site, management of solid waste and sewage will be an issue. Therefore, the effects are significant.	Significant
7.2.4.8 Relations between workers and the school children / staff / people living in the vicinity of the site and possibility of disputes The mitigation site is a school. 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 school staff and the children as indicated below. • Cause nuisance to smooth operation of school works • Unauthorised entry into school premises • Bulling and harassment to children • Quarrels with children and parents • Distracting children from education • Tempting children and parents towards offensive deals • Informal form of child labour	Highly Significant

• Use of sanitary facilities of school by the workforce • Sexual abuses for the children Further, the proposed mitigating sites are located close to the hostel there will be labour nuisance from night-time construction activities. Although the workers who would engage in such issues will be rare, even few possibilities cannot be ignored. Therefore, issues indicated above at this site will be considered highly significant.	
7.2.4.9 Workers safety during construction The workers may be exposed to risk of facing accidents. The constructions are carried out in a very limited space. They also may face risk of falling from the unstable slope. Fatal injuries may occur due to the ignorance of workers and overstepping the moving dimensions resulting into accidents. The heavy construction machinery may be used in limited work spaces. Risk of hazard from vehicles and construction machineries accidents is also highly significant at this site. Contractor may engage under age workers (children) for construction work, which is risky and can result in serious accidents and injuries.	Highly Significant
7.2.4.10 Risks of school children accessing the site during construction During the construction phase site may use excavation machineries, loaders, trucks etc. These machines and heavy vehicles etc. will be used in the school premises where school children and staff are moving. Site may use high voltage power for operation of certain machinery. Construction may use materials such as metal aggregates, steel etc. which can be injurious under improper storage and handling. The school children will be attracted to these machineries, materials and may even enter the site without proper awareness of the site staff. Ignorance of entry of school children and careless operation of machinery can cause fatal injuries and accidents to school children. The risk on school children at site is therefore highly significant.	Highly Significant
7.2.4.12 Impacts on transport infrastructure (especially temporary loss of road or rail access, risks of traffic congestion) Machinery and material transportation will interrupt the transportation of road. Further, material & machinery transportation to the proposed mitigatory site may affect the access to the school.	Highly Significant
7.2.4.13 Areas used for businesses, agriculture or other within the area to be remediated There are no areas used for business, specific agriculture practices or other within the area to be remediated.	Insignificant
7.2.4.14 Areas used for businesses, agriculture or other immediately adjacent to the site There are no areas used for business, specific agriculture practices or other immediately adjacent to the site.	Insignificant
7.2.4.15 Need for people to enter or cross the site Excavation machineries, loaders, trucks etc. will be used in the school premises where children and staff are moving. There is no special need for them 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, unauthorised 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 3: Site specific risk analysis

Risk	Affected group	Risk level
1. Facing accidents when working / shifting in between roads	Workers/school children	Very high
2. Transporting materials and machineries	Workers/school children	Very high

3. Throw out disposals (litter, bottles, and food) to the school premises from the construction site	school children/ staff	Very high
4. Injuries due to rock particles due to explosions/ blasting	Workers/school children	High
5. Soil may fall from the unstable area	Workers/school children	High
6. Work with electrified supply lines	Workers/school children	High
7. Site Working – Working in poor visibility	Workers	High
8. Lone Working	Workers	High
9. Emergency evacuation	Workers/school children	High
10. Extreme weather conditions (wind, rain etc.)	Workers	High
11. Facing accidents when working / shifting in between roads	Workers/school children	Very 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 an 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 labor & Forced labor 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 is no project-based resettlement in this site. The buildings/houses may have some impacts in the form of structural damage during the project actions due to ground vibration induced by heavy machinery operation. (The scheme of compensation, in case of damage to structures due to project should be arranged, (Refer 2002.2.17) utilities and roadside amenities in contracts requirement to ESMP.

10.2 Evacuation of people

During the construction period of the project, it may not require to evacuation of the school children from school buildings. If necessary, the school children may be evacuated during the construction phase temporally.

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

This risk may not be triggered in this site.

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

This risk may not 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 specially the school children, teachers and the parents of the school.
- ii. Requirement for special awareness for the parents of the school about mitigation works and the safety of their children

10.6 Design based Environmental/ Social Management considerations

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

Table 4: 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.	Moderate
ii. Site Planning During site planning it is necessary to be cautious on possible re-activation of slope failures and movements of soil masses. Hence vehicle parking sites, material storage and temporary shelters etc. should not be installed in the danger zones of the slides.	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 extraction of water is involving as a mitigation measure, as the extracted water is in a good quality and yield it can be considered as a source of water for school usage such as gardening and sanitary activities.	Moderate
v. Interruption to water supply lines, sewage lines and waste water lines Water supply lines may be located in the mitigated slope and septic tanks with the sewage lines may be located in within the school. The design should consider these elements and should try to minimize the impacts by selected design considerations.	High
vi. Aesthetically compatible design considerations The designs in aesthetically sensitive school environment 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 migratory works are carried out in well maintained school premises with green landscape, 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.	Very high

viii. Workers / students and community safety Activation of slide may occur during construction phase and may pose threat to workers, school children and the staff. Therefore, design-based safety consideration such as berms, safety nets, safety fencing etc. should be considered specific to safety of school children should be considered.	Very high
ix. Erosion control structures During rainy season the flow in these drainage structures can be significantly high. During rainy season the heavy flow of surface runoff can be expected through the unstable slopes. This water should be conveyed to nearby storm water drains. Hence the design should adequately consider flow speed breakers to reduce erosive flows of slopes within the school.	High
x. 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 used for structures should be chosen carefully so as to withstand weather conditions with high durability. Designs should specially consider corrosion prevention techniques if steel structures are used.	High
xi. 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.	Moderate

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 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 summarised below (Table 5) indicating the degree of relevancy for this site. For details ESMP for construction contractors should be referred.

Table 5: 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
2002.2 2)	Noise and Vibration	Highly Relevant (school premises)
2002.2 3)	Cracks and damages to the buildings	Highly Relevant (buildings)
2002.2 4)	Disposal of waste	Highly Relevant (school premises)
2002.2 5)	Disposal of refuse	Highly Relevant (school premises)
2002.2 6)	Dust control	Highly Relevant (school premises)
2002.2 7)	Transport of Construction materials and waste	Highly Relevant
2002.2 8)	Water	Relevance
2002.2 9)	Flora and Fauna	Low Relevance
2002.2 10)	Physical and cultural resources	Low Relevance
2002.2 11)	Soil Erosion	Highly 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 (pollution)	Highly Relevant
2002.2 16)	Disruption to public (school children)	Highly Relevant
2002.2 17)	Utilities and roadside amenities (road)	Highly Relevant
2002.2 18)	Visual environment enhancement	Highly 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	Refer site specific monitoring plan
	Reporting and maintenance of records	Relevant
2003. Working Conditions and Community Health and Safety (school children)		
2003.2	Safety organization and communication	Highly Relevant (school children and staff)
2003.3	Child Labor and Forced Labor	Highly Relevant (school premises)
2003.4	Safety reports and notification of accidents	Highly Relevant (school premises)
2003.5	Safety Equipment and Clothing	Highly Relevant (school premises)
2003.6	Safety inspections	Highly Relevant (school premises)
2003.7	First Aid Facilities	Highly Relevant (school premises)
2003.8	Health and safety information and training	Highly Relevant (school premises)
2003.9	Plant equipment and qualified personnel	Highly Relevant (school premises)
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 monitoring requirement indicated in contractors ESMP 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 6: Site specific ES & HS mitigation measures

Mitigation item	Project implementation phase	Responsibility
i. Minimize erosional 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 upslope mitigation are carried out in the dry season and avoid such activities on upslope 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
ii. Planning project activities inside the school premises As contractor has to operate mitigation actions within the school premises and church premises, he should carefully prepare a plan for management of construction activities inside the school premises. This should include careful selection of material storage as vehicle parking, mixing of concrete, cleaning activities etc. which considering the safety and optimization of space.	Site preparation & construction	Construction Contractor

The contractor should discuss scales of project operations with a time plan and should make the school management adequately aware on the construction plan. Necessary adjustments to the plan should be made after discussing with the school management in order to minimize the disruption to school activities with special attention to working hours minimizing nuisance to during conducting classes special school events etc.		
iii. No Entry Zone The PMU should make a detailed assessment on possible risk of slope destabilization in the site during construction phase. No entry zones may require to be declared. This should be made adequately documented and communicated to the contractor and the school management. Also mitigate the risk of accidents from moving vehicles operational machinery construction activities, electrical leakages etc. should be given high priority in the health and safety management plan especially considering potential high risk on school children. As there is a school premises within the site proper safety measures should be included with warning signs and permanent trained watchmen. Sign boards indicating slope instability risk are strongly recommended at this site.	Construction	E & S Unit of PMU contractor
iv. Machinery and material transportation Access roads need to be used for machinery, materials and vehicle transportation for mitigation locations during construction phase. Machinery and material transportation should not be done through the staircase of the school. School premises should not be used as a location for material storage. The contractor should pay special attention for this matter and extreme care should be taken to prevent possible accidents in the road and damages to the school assets. The management of the school should aware if the location requires shifting machineries.	Construction	Construction Contractor
v. Invasive species Should be avoided in using vegetative erosion control structures. Native plants in the local environment should be chosen for vegetative control.	Construction	Construction Contractor
vi. Noise and vibration control The noise and vibration generating activities may disturb the smooth flow of activities of the school. Vibration generating activities should be done within the prescribed limits to avoid damage to structures. Cracks in the buildings should be monitored before, during and after completion of the project. Suitable compensation should be made if cracks from the damages or cracks enlarge due to construction work.	Construction	Construction Contractor
vii. Disposal of construction waste The contractor should pay special attention with respect to disposal of construction waste. This site is located within a school premises with a pleasing and clean environment. 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 within the school premises or along the road.	Site preparation & construction	Construction Contractor
viii. Dust and aerosol control screens The dust particles generated during the construction period can influence the school children and the staff members. Special screens etc. should be used if heavy dust or aerosol generating activities are envisaged.	Site preparation & construction	Construction Contractor

ix. 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 the access road to the school must not be blocked and 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
x. Water and electricity for construction Water and electricity for construction works should be obtained only from a separate supply lines under the approval from school. Contractor intends to use water and electricity from separately.	Construction	Construction Contractor
xi. Priority Health and Safety Issues As the workers in 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. Additionally, work should be discontinued for sufficient time period during rainy period as working on unstable slopes will be highly risky in the rainy season. ii. A good warning system and fulltime watchmen is highly recommended for this site for both worker and school children safety. iii. Safety barriers and safety nets should be installed at places of risk to protect workers and school children from boulder falling risk iv. Proper emergency management unit for other accidents (first aids facilities, safety items, hospitalization facilities and transportation facilities) should be maintained for this site.	Construction	E & S Unit of PMU contractor
xii. Safety structures/sign boards During construction phase adequate safe fencing should be established to prevent potential falling risk of workers from upslope areas. Warning sign board indicating slope instability risk should be placed at the unstable slope areas with the access road which are occupied by the children to access to the playground. As the risk is high during the rainy season where there is no construction work it is mandatory that safety signs boards are displayed even during the no project period as well.	Construction	E & S Unit of PMU contractor
xiii. Use of sanitary facilities of contractor's workforce School management does not allow using toilets of the school for the contractor's workforce. Therefore separate sanitary facilities should be arranged for the workforce.	Construction	Construction Contractor
xiv. Working hours The construction activities should be in accordance with school management. Noise, vibration and dust generation activities should be carried out after school hours, however, not disturbing the students school. During exam times disturbing (noise and vibration) activities are not allowed. Night time operations are allowed only during school vacations. If night time operations are required to achieve project targets such works should be carried out with adequate safety measures and the consent from the school management.	Construction	Construction Contractor

xv. 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
xvi. Safety of school children The school management should be made adequately aware of possible issues detrimental to school children as indicated bellow - Expose school children towards narcotics, alcohol, sex abuse, smuggling, and various criminal offenses and a wide range of unsuitable habitual behaviours - Unauthorised entry into school premises - Bulling and harassment to children - Quarrels with children and parents - Distracting children from education - Tempting children and parents towards offensive deals - Informal form of child labour The PMU ES unit should engage in meaning full consultation with school management regarding above mentioned issues. Each issue should be properly communicated and adequately discussed with the school management. Also, it is advised that PMU request from the school management on the following - Make students and parents aware of the project - Possible social issues that will have impact on children - Establish a system of vigilance to monitor the behaviour of children with the workforce and the movement of workforce during construction phase - Establish a confidential information receive system in the school premises to receive any complains pertinent to the project - Enforce a system to punish or remove troublesome workers The PMU should made contractor aware on all potential issues with contractor workforce and school children that should be properly managed. Following are recommended for contractors' workforce - Proper awareness, education, monitoring and punishing. - Define project activity zone beyond which workers cannot enter - Workers cannot use water sources of the school - Workers cannot use sanitary facilities of the school - The contractor should not use children for any form of project related works (direct/indirect) - The heavy machinery operators should be extremely cautious in operation of machinery as possible accidents will be high. - Full time watchmen should be kept in the risk area to ensure safe movement of heavy machinery and vehicles Other - Adequate no entry / danger signs and monitoring should be established so that school children are not permitted in the project area - The electrical wiring systems and layout should be done with proper safety measures approved by the PMU ensure that accidents mainly to children from electric shocks are prevented	Construction	E & S Unit of PMU contractor

iii.	Parking and storage areas should be done in approved locations by the PMU		
iv.	Parking and material storage should not be done at the area of open theatre		
xvii.	During construction good housekeeping should be maintained to minimize visual pollution	Site preparation & construction	Construction Contractor
xviii.	Workers code of conduct Possible disputes between the labor force and the students, staff and the parents, commuters and pedestrians should be prevented by maintaining the agreed code of conduct by the contractor.	Construction	Construction Contractor
xix.	Snake bites, toxic insect bite management and emergency management by accidents Proper emergency management system for snake bites and toxic insect bite (include awareness on snake bites, safety shoes while at work, first aid on a snake bite, hospitalization and admission to correct hospital where snake bite management facilities are available) should be introduced. Accidents are common in these kinds of sites. Proper emergency management unit for other accidents (first aids facilities, safety items, hospitalization facilities and transportation facilities) should be maintained for this site.	Construction	Construction Contractor
xx.	Management of emergency accidents Accidents are likely in a site of this nature; therefore, a proper emergency management system shall be established and maintained throughout the construction period. This shall include first aid facilities, essential safety equipment, and trained personnel on site. Arrangements shall also be in place for rapid hospitalization and reliable transport facilities to ensure immediate response during emergencies.	Construction	Construction Contractor
xxi.	Emergency Response Plan The contractor for the project shall establish Emergency Response Procedures for the site, as it is located in a public place, to ensure a rapid, organized, and effective response to emergencies that may arise during construction activities. Approval to be obtained for the Emergency Response Plan and to be communicated to the workers and the school.	Construction	Construction Contractor

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 7: Environmental and Social monitoring plan; construction phase

Monitoring requirement	Parameters	Frequency
i. Baseline monitoring	Water quality	-
	Pre-construction crack survey (School buildings)	Once*
	Ground vibration	Once*
	Air quality: particulate matter	Once*
	Background noise measurement	Once*
ii. During construction	Water quality	-
	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 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 National Environmental (ambient water quality) regulations, no.01 of 2019 Pre-construction crack survey of the high-risk buildings -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.	

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

12.1 Public Consultations

School staff was consulted about the project works during the field visit.

12.2 Stakeholders involved in the consultations any recommendations or agreements reached in the consultations (Refer annexure II)

Mr. P.M.N.C. Kumara, Principal of the school and Mr.D.M.H. Thennakoon, development officer of the school were informed about the project works and made aware about the project.

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

Table 8: Clearances, no objection, consent and approvals

Requirement / Approval / Institution	Relevance to the project
13.1 Project implementation	
Approval from the District Secretariat	The approvals will be required and the proposals need to be presented at the District Coordinating Committee, 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 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 Kandy pradeshiya council.
13.2 Approval from the state lands owners relevant to the project	
Central Environmental Authority	Consent from District Central Environmental Authority is required as Badulla District is under the sensitive area under Soil Conservation Act 25 of 1951.
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).
Kandy Divisional Secretariat	Approvals from Kandy 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-Project Managed slope mitigation shall be imported into Sri Lanka under the authority and in accordance with the conditions, of a plant importation permit issued.
13.3 Consent/ no objection/ legally bound agreement from the private land ownerships	
Land owner (Department of Education)	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 timeline for getting approval is given in the table 9.

Table 9: 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 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 (Department of Education)	—	—						

14. 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*).

15. 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 10: 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, Other district levels Agencies, NBRI 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, I Divisional secretary, Police, State Land Owners, Grama Niladhari, District Office NBRI, 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, I Divisional secretary, Police, State Land Owners, Grama Niladhari, District Office NBRI, AIIB and relevant parties as appropriate	Meetings, submission of relevant reports

vi. Grievance redress mechanism	Relevant parties, AIIB	Meetings, written and verbal communications
---------------------------------	------------------------	---

Table 11: Level of information gathered through consulting institutions

Date	Institution	Person contacted for information
19/06/2026	Dharmaraja College	Mr.D.M.H. Thennakoon, Development officer 0789034931 08122344495

Annexure I: Images of the site condition and the consultation



*Consultation with Mr.D.M.H. Thennakoon,
Development officer of the school*

Annexure II: Report on the Stakeholder Consultation: Kandy 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, Kandy 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.

Annexure III: Study team

Name	Designation	Position in the study
SAMS Dissanayake	Senior Scientist/ESSD/NBRO	Senior Environmental Scientist
Prabath Liyanaarachchi	Scientist/ ESSD/NBRO	Environmental scientist
K.R.H.M.O.N Herath	Civil Eng. (Scientist)/ ESSD/ NBRI	Demographic data collection, Report preparation
A.G. Randombage	Project Assistant	Demographic data collection /survey, Report preparation

Annexure IV: List of references

1. Contractor's obligations for Generic Environmental and Social Management Plan- Sri Lanka Landslide Mitigation Project-AIIB
2. Environmental and Social Management Framework-Sri Lanka Landslide Mitigation Project - AIIB
3. Resettlement Planning Framework- Sri Lanka Landslide Mitigation Project -AIIB

4. Felling Trees (Control) Act by Ministry of Agriculture, Rural Economic Affairs, Livestock Development, Irrigation and Fisheries and Aquatic Resources Development