REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES PROJECT

Site Specific Environmental and Social Management Plan

Site No. 116

Entracne road of Kukuleganga control unit

Kalutara District

February 2019

Prepared for:

ASIAN INFRASTRUCTURE INVESTMENT BANK

Prepared by:

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Abbreviations

AIIB	Asian Infrastructure Investment Bank
CEA	Central Environmental Authority
DFC	Department of Forest Conservation
DSD	Divisional Secretariat Division
DDCC	District Development Coordinating Committee
DWLC	Department of Wild Life Conservation
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
GND	Grama Niladhari Division
GOSL	Government of Sri Lanka
GSMB	Geological & Mines Bureau
NBRO	National Building Research Organisation
RDA	Road Development Authority

1. Introduction

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

The purpose of the ESMF is to provide a guide for application of AIIB safeguards and national environmental and social mandates during the implementation of project actions. The project implementing agency National Building Research Organisation (NBRO) is expected to ensure implementation of environmental and social management plans prepared under the ESMF at all phases of project so that the impacts on the environment and community can be minimized.

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

2. Location details and site description

Province	: Western Province
District	: Kaluthara
DSD	: Palindanuwara
GND	: 836 D Kelinkanda
Village/Location	: Entracne road of Kukuleganga control unit
Site Reference	: Package 07 (Site No.116)
GPS Coordinates (Lat/Lon)	: 6.610820N 80.2793E

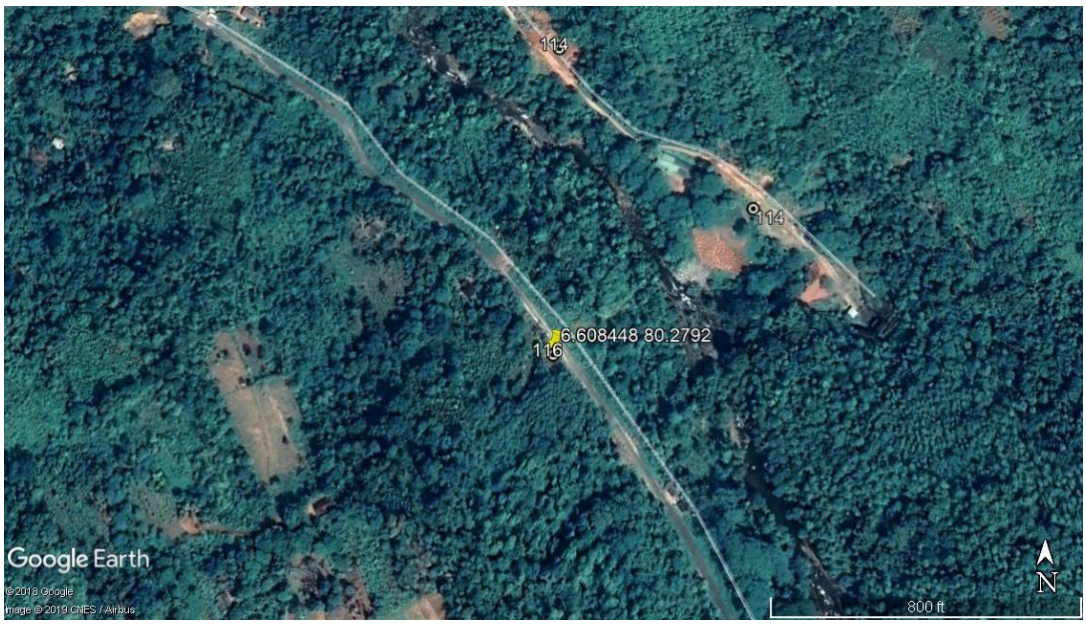

Fig 1: Location of the site

AIIB- Kalutara - Site No: 114 & 116

Fig 2: Drone image of the site

1:2,000

0 55 110 220 m

3. Landslide hazard incident details

During the torrential rainfall large soil mass is unstable and tensional crack had been developed alongside of the road and failure was happen extending up to about 40 meters and creating the 300 Sq.m slope area.

Fig 3: slop failure can be identified at the site

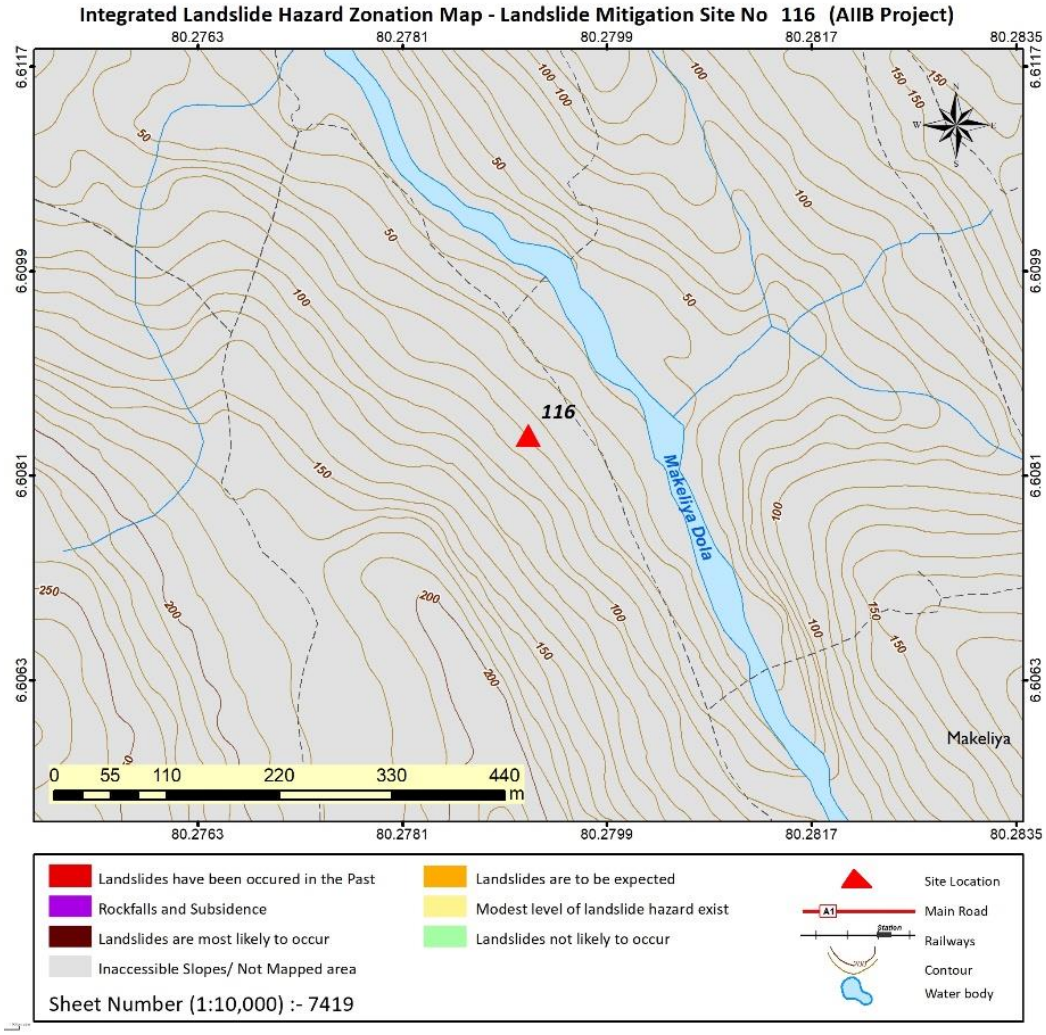

Fig 4: Location of the site in landslide hazard map

4. Remedial measures already undertaken to reduce potential risk

No remedial measure was undertaken to reduce potential risk.

5. Description of the surrounding environment

- Major road cutting failures and several minor cutting failures can be observed along the road
- Unstable large boulders scattered on the slope (boulders terrain)
- No proper surface drains main on the rubber cultivate slope. Ground slope angle ranges 260 – 380.
- Minor road cutting failure may develop in to slope failures

6. Description of the works envisaged under the project

The mitigation activities for the site could be expected as follows;

- Soil nailing & cable anchoring recommended to mitigate minor scale road cutting failure
- Major road cutting failure should be stabilize with a gabion wall
- Surface and subsurface drainage system is essential

7. Approval from relevant agencies

7.1 Approval from District Secretary and District Development Coordinating Committee (DDCC)

Approvals will require to be obtained from the District Secretary for the implementation of project. Consent of the District Development Coordinating Committee (DDCC) also should be obtained for proposals. Issues arrived during stakeholder consultation and recommendations taken up at DDCC meeting will be addressed in the ESMP.

7.2 Approval from Road Development Authority

i. NBRO will submit the detail design of the mitigation work to Provincial Road Development Authority with a formal request on nature of approvals required.
ii. On the approval by PRDA an agreement will be signed between PRDA and Project implementing agency to access the site, erect structures, and implement mitigation works.

7.3 Approval from Local Authority

i. Prior to project implementation approval will be obtained from the planning committee of the respective local authority.
ii. Certificate of Conformity will be obtained upon project completion as per development permit.

7.4 Approval from other agencies

i. Approval from regional Geological Surveys and Mines Bureau will be obtained for transportation and disposal of earth, rocks and mineral debris
ii. Approvals from respective local authority will be obtained for the disposal of waste.

7.5 Consent/ no objection/ legally bound agreement with land owners

i. Signing a legally bound agreement between the land owners and NBRO allowing no-objection to remove debris, access the land, implement construction works, and engage in long-term maintenance works.

ii. Allow land owner to extract/ or extraction by the contractor on behalf of the land owner any valuable items from the structures.

Table 1: Tentative timeline for getting approvals

Approvals	Month 1				Month 2			
	W1	W2	W3	W4	W1	W2	W3	W4
Approval from District Secretariat / DDCC								
• Submission project details	—							
• Project briefing		—						
• Respond to clarifications			—					
• Approvals				—				
Approval from Road Development Authority								
• Submission of application		—						
• Respond to comments		—						
• Approvals			—					
Approval from planning committee								
• Submission of preliminary planning clearance application with project briefing	—							
• Issuance of Preliminary Planning Clearance Certification / Letter with conditions		—						
• Submission of development permit request fulfilling Preliminary Planning Clearance			—					
• Obtain development permit					—			
Other approval								
• Geological Surveys and Mines Bureau						—		
• Consent/ no objection from the private land ownership						—		
• Signing agreement with land owners							—	

8. Environmental and Social Management Plan (ESMP)

This section includes the specific ESMP for planning phase, design phase and construction phase.

	Environmental / Social impacts	Mitigation measure(s)	Monitoring sources	Responsible party(ies)
1. PLANNING PHASE				
1.1 Plantation	Loss of large tree cover may lead to erosion and loss of livelihoods.	Obtain clearance from relevant authorities.	Clearances documents obtained	NBRO Divisional Secretariat
1.2 Access and mobility	Vehicular movement will be obstructed during the week days, in office hours, school times, (in morning, day time and evening). This will cause nuisance to pedestrians and commuters.	Necessary traffic management measures for facilitating mobility. Provide alternative temporary access for pedestrian and access for continuing business (Refer section 07 of ESMF for compensation details for loss of access).	Traffic survey	NBRO RDA, RDD, Local Authority Sri Lanka Police
1.3 Removal of debris	Unless safety measures are adopted during demolition, it may lead to health issues and accidents.	Project planning should consider to avoid intervening with housing units as much as possible. Meaningful consultation should be done to get the consent of the landowner agreed for removal of debris.	Sign a legally bound agreement between the land owners and NBRO allowing no-objection to remove debris is mandatory. Spot check	Contractor NBRO

	Environmental / Social impacts	Mitigation measure(s)	Monitoring sources	Responsible party(ies)
2. DESIGN PHASE				
2.1. Natural resource management & resource optimized designs	Removing of vegetation cover will affect rain fall.	Project specific designs should be considered to eliminate mass clearing of vegetation and minimum number of removal of grown tree species. Sufficient emphasis should be made to consider conservation of trees and species.	Baseline survey on type of trees grown within project area. Survey on type of trees available after deign.	NBRO Divisional Secretariat Department of Forest
2.2. Conservation of water resources.	Extraction of surface and sub-surface water.	Water should be extracted relatively in good quality. Well extracted water can be conveyed in such a manner that can be accessed by fauna as well as the neighboring communities.	Monitor stream water quality comparison with ambient water quality standards published by the CEA, 2017	CEA NBRO
2.3.Aesthetically compatible design consideration	Visual pollution	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.		NBRO

2.4 Green environmental design	Possibility of degradation of fauna and flora due to project design and construction material.	Consider green environmental designs as much as possible **Ex.** use of local vegetation species for erosion control, avoid inclusion of potentially invasive species & etc.		NBRO
2.5 Erosion control	Water may be extracted and conveyed to nearby streams often through culverts. During rainy season water flow in these drainage structures can be significantly high and this may cause stream bed and bank erosion.	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.		NBRO
2.6. Water supply and electricity network	Electricity network runs through the project site and there is possibility of interruption in electricity supply due to construction.	Design should consider construction activities without interrupting electricity network.		NBRO

	Environmental / Social impacts	Mitigation measure(s)	Monitoring sources	Responsible party(ies)
3. CONSTRUCTION PHASE				
3.1. Disposal of construction waste	Lack of solid waste management on site can lead to the lack of general cleanliness due to waste material resulting from the demolition. This can lead to pollute the environment such as waterways and adjoining lands. Will lead to attraction of diseases bearing vectors such as rats and mosquitoes.	Such waste if generated should store properly without getting washed off and dispose according to approved procedures of the PMU. Under no circumstances solid waste should be burned on site. Contractor's potential to dispose refuse in an ad-hoc unauthorized manner should be avoided. Disposal near stream banks, into streams should be avoided. Depositing refuse near road reservations should be avoided.	Solid waste storage is demarcated. Remove construction solid waste at end of construction. Make arrangements with Local Authorities on disposal of solid waste generate during construction.	Contractor Environment Officer
3.2 Erosional impacts	Erosional impacts on the environment may happen during the removal of debris.	Avoid slope reshaping, removal of debris during rainy season and avoid such activities on upslope area during wet season as much as possible.		Contractor Environment Officer
3.3. Dust and aerosol	Dust generating from the construction site may pollute the atmosphere.	Special screens etc. should be used if heavy dust or aerosol generating activities are envisaged.	The National Ambient Air Quality standards stipulated under the Extraordinary Gazette, No. 1562/22 August 15, 2008 - Central Environmental Authority of Sri Lanka.	Contractor Environment Officer CEA

3.4. Water for construction	Water consumption for the construction purpose would affect the water lacking for surrounding community and environment.	Water for construction works, should be obtained only from the approved sites.		Contractor Environment Officer
3.5 Cutting trees to get timber for construction work		Under no circumstance contractor shall use local trees for construction support strictures: scaffoldings etc. Use of non-timber materials for scaffoldings and support structures should be made compulsory to contractor unless in essential cases.		NBRO
3.6 Culturally important structures, events and archeological sites		If culturally sensitive places present, contractor should carry out work without disturbance to cultural activities. Construction work may be temporarily suspended on festival days. Noise and vibration prone machinery use should be strictly controlled on cultural days.		Department of Archeology (provincial) NBRO
3.7 Damage to service facilities	Possibility of damages to water supply and electricity lines.	Contractor's obligations should include a proper assessment on service facilities that may have to be removed Ex**:** Telecommunication lines, electricity lines, water lines, drainage lines. Necessary early precautions should be made in site preparations to remove and re-install in secured places.		NBRO Contractor

3.8 Loss of land	There is a possibility of 400 sq.m perch land impact due to construction activities. Possibility of losing productive lands including damages to crops due to construction. Possibility of remaining portion of the land become economically non-viable due to construction.	Rebuild the land to original or better condition when remaining land is sufficient to rebuild according to approved procedures of the PMU.	Compensation arrangements (Refer section 07 of ESMF for compensation details for loss of land due to project related activities).	NBRO
3.9 Worker's safety	Activation of potential landslide during construction phase and may pose threat to workers and commuters Workers may be exposed to risk from falling. Fatal injuries may occur if the slope fails. The risk of slope failure is aggravated during the rainy season.	Design based safety consideration such as safety nets etc. should be employed.	Comply with Environmental and Social Health and Safety (ES & HS) requirement included in contractors' bid document.	NBRO Contractor
3.10 Noise and vibration	Possibility of noise pollution and vibration generate from construction activities.	Operations of machinery in off time should be avoided. Meaningful consultation should be done with the occupants of the houses avoid any disputes that may arise during operation of heavy machinery in unavoidable circumstances.	The high noise and vibration pollution during construction activities should be monitored with respect to national pollution control regulations.	NBRO Environment Officer CEA