

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

**Site No. 05  
Veyangoda- Ruwanwella Road  
(CH 15+740 to CH 15+790)  
Gampaha District- Package 3  
October 2018**

**Prepared For:**

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

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## **Abbreviations**

AIIB	Asian Infrastructure Investment Bank
CEA	Central Environmental Authority
DFC	Department of Forest Conservation
DS	Divisional Secretary
DWLC	Department of Wild Life Conservation
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 Social Management Plan
GN	Grama Niladhari
GOSL	Government of Sri Lanka
GSMB	Geological & Mines Bureau
NBRO	National Building Research Organization
RDA	Road Development Authority

## 1. Introduction

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

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

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

**This is the site specific environmental and social management plan for Veyangoda- Ruwenwella Rd- 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 regulation and procedures to be followed during project implementation specific to the site

## 2. Location details and site description

Site reference: Site No 5, Package 3 –Gampaha District, Veyangoda –Ruwanwella road, CH 15+740 to CH 15+790

### Site Details

- i. The proposed mitigation site falls under Sapugasthenna GN division of the Attanagalla DS division, Gampaha District, Western Province.
- ii. Cut slope failure at upslope of the road section between CH 15+740 to CH 15+790
- iii. The location is at Left hand side of Veyangoda- Ruwanwella Road
- iv. The nearest town to the site is Veyangoda about 15 km from this location
- v. GPS reference of the site is 7.092274°N, 80.167877° E. Ref. Google image of the location Fig.1.
- vi. The land ownerships are road reservation of RDA and lands belonging to Malwatta Plantation Company

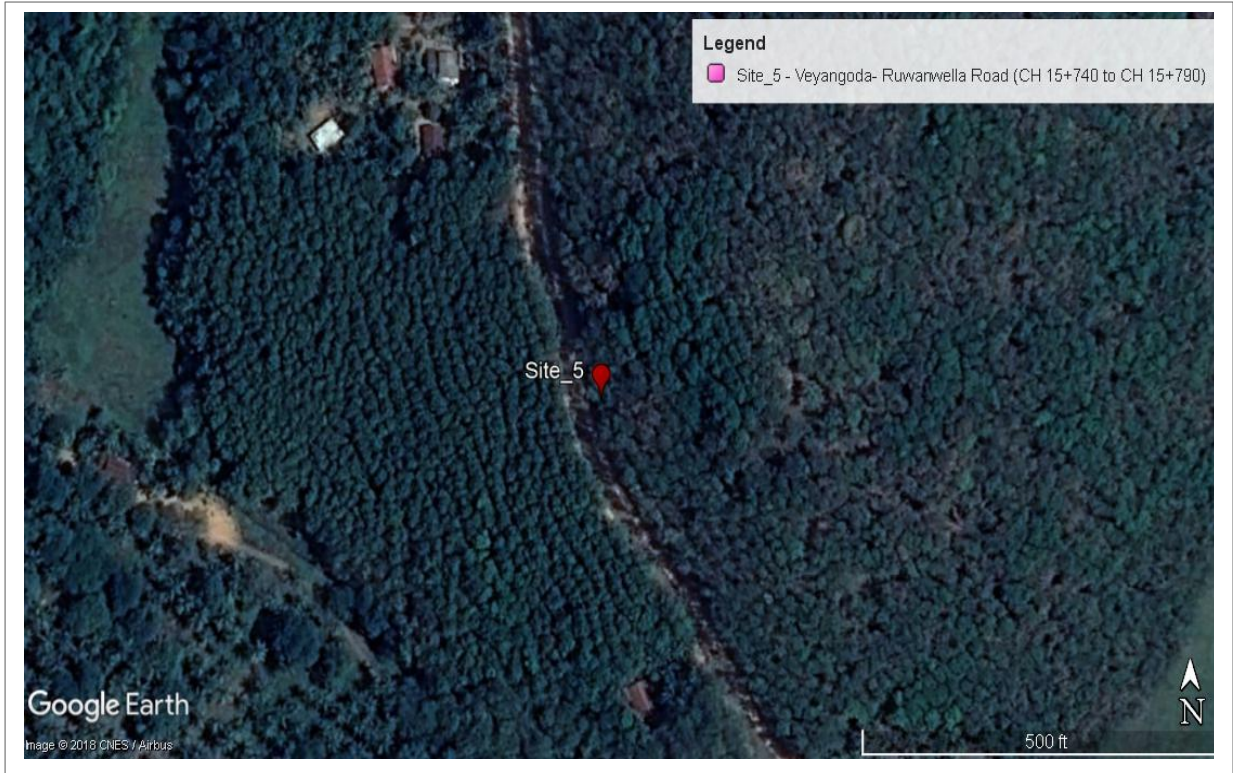


Fig 1: Google image of the location proposed landslide mitigation site. Ref. drone image for details-Annexure I

### 3. Landslide hazard incident details

A heavy precipitation in May 2017 had triggered a cut slope failure at this road section. The debris mass had extended downslope covering completely the road at this location while depositing soil and rock fragments on the road. The slope failure had been failing time to time causing the road closure many times. Repeated slope failures had caused obstruction to traffic fleet every time while the incident. There were no casualties due to the incident. Refer Fig 2: Images of the project area.

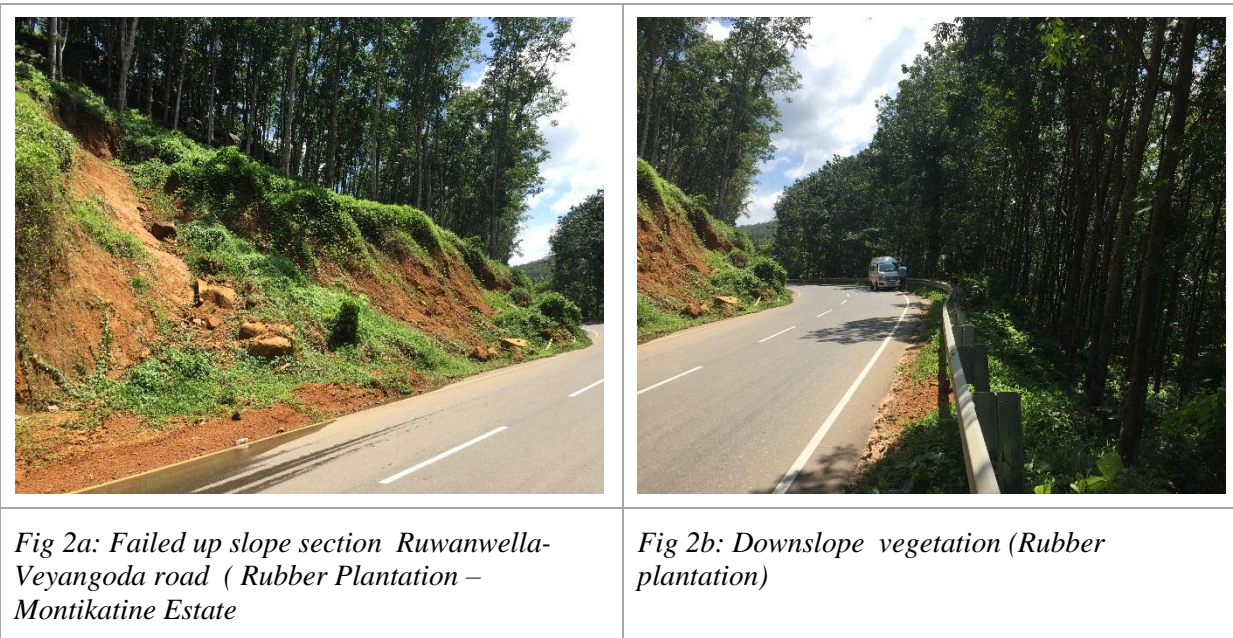


Fig 2: Images of the project area



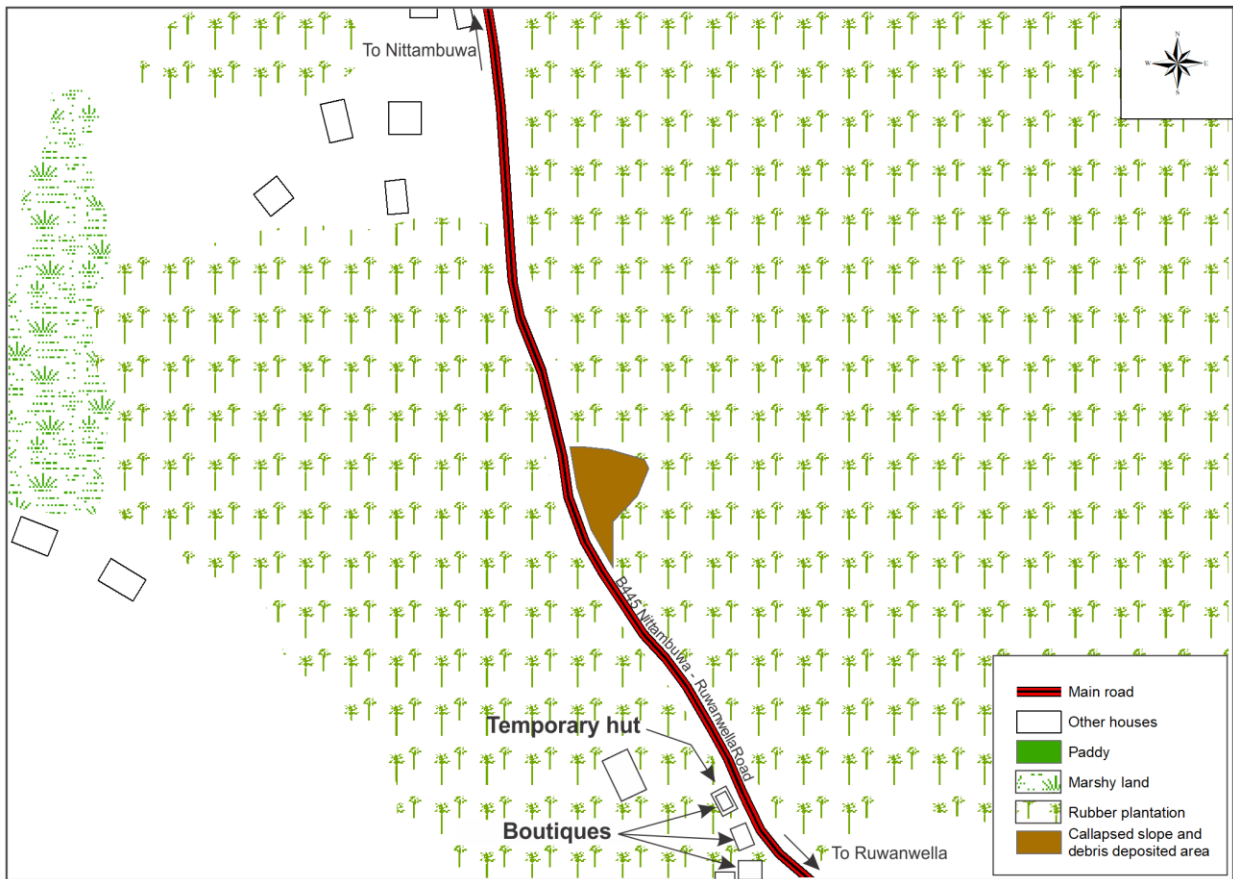


Fig 3: Diagrammatic interpretation of affected slope in “Montiketine division of Malwatta Plantation Company due to ground movement

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

NBRO had inspected the site after the incident and had informed the people and RDA to be vigilant from further risk of slope instability. No physical remedial measures were introduced to improve the drainage or to remove overlying debris deposits on the slope.

*Evacuations:* There are no houses located closely.

#### Life risk management measurers

Since there are no houses close to the site, no life risk management measures propose for this site.

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

The section where slope failure had occurred was a vertical slope cut at CH 15+740 to CH 15+790 on the left hand side of the Veyangoda- Ruwanwella Road. The surrounding area is a rubber plantation in a hilly terrain belongs to “**Montiketine division of Malwatta Plantation Company**. In the failed section a large block of soil mass had moved down and now resting in the road reservation area. This unstable section and slope poses life threatening risk on the commuters and pedestrians. As this is the main connectivity road between Kegalle (Sabaragauawa Province), and Gampaha districts (Western province), the obstruction to traffic may pose a significant impact to road uses, the service providers, the related economic activities and transactions between Ruwanwella and Veyangoda.

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

The vegetation in the area where slope failure had occurred is a disturbed vegetation with species at early succession. The elements and services that will be at risk during the project implementation are;

- i. The vehicles on the road, the commuters and pedestrians
- ii. The businesses in the roadside boutiques
- iii. Occupants in the roadside boutiques
- iv. Current businesses and service activities in the area in general

## **7. Description of the works envisaged under the project**

The proposed mitigation works will be largely concentrated on already failed upslope area. The type of mitigation works will be i) slope reshaping and removal of impeding weak soils to achieve more stable slope geometry, ii) removal of deposited debris from earlier failures, iii) improvement to the drainage, which includes improvement to both surface and subsurface drainage iv) retaining walls, v) erosion control measures.

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

### **8.1 Positive impacts**

The road is the one of the connectivity road between Ruwanwella (Kegalle District) and Veyangoda - Gampaha Districts). The mitigation work will ensure uninterrupted traffic flow and road connectivity throughout and will increase the safety of commuters. Also, rubber industry, services, economic activities and other life line functions of the people in Ruwanwella and Veyangoda areas will be benefitted largely by this mitigation. Quick remediation may secure the cost of road rehabilitation from future damage to road.

### **8.2 Negative impacts**

The mitigation works are generally confined to an area which is already disturbed by a slope failure. Therefore, negative impacts are much localized and limited to construction period.

#### **8.2.1 Loosing access to land and future development activities**

The mitigation works will be concentrated on steep upslope of the road. Since the area where direct project activities are taking place is a small plot of already degraded land, there will be no impact to the land owner with regard to loosing access to the land or loss to valuable uses. The, remediation works in the upslope will increase stability of the boundary and protect the land from future failures.

#### **8.2.2 Ecological, biological impacts, and fauna and flora**

There are no forests, wetlands or natural vegetation patches with rich bio diversity within the project influence area that will be affected by the project actions. During the project implementation there will be requirement of cutting/ uprooting rubber trees.

#### **8.2.3 Impact on the drainage pattern of the area**

The project actions will be confined to a limited section of the failed slope where there are no active springs or streams. Hence, project activities will not cause a significant change to drainage pattern in the area.

#### **8.2.4 Erosional impacts and stream bed alterations**

The mitigation section of the unstable slope will be prone to erosion during frequent heavy rains. This will generate sediment laden runoff. The runoff will be directed to streams and water bodies. As there is no natural stream running close by and as the flow of runoff will not be substantial there will be no significant erosive flows and river bed alterations in natural streams in the area due to the project.

### **8.2.5 Water pollution impacts from construction activities**

Since there is no stream close to the site, direct water pollution impact are low. However, during rainy season, fines, sediments and soil particles can contaminate the storm water and may convey through waterways further downstream.

### **8.2.6 Open defecation and waterborne infections spread during construction phase**

Faecal contamination of down slope water stream will not be expected during construction due to open defecation as the slope is closes to the road.

### **8.2.7 Impacts on the downstream water uses**

Since there are no water courses nearby impact is insignificant.

### **8.2.8 Solid waste disposal issues**

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

### **8.2.9 Air pollution impacts**

Construction activities that contribute to air pollution include: land clearing, operation of diesel engines, demolition, burning, from storage, transportation disposal of construction materials, construction waste and working with toxic materials. During construction, it generates high levels of dust typically from concrete, cement, wood, stone, and silica. The air pollution impacts from the construction is locally significant during dry periods may attack commuters, pedestrians and occupants in the roadside boutiques.

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

There are four small temporary boutiques on the opposite side of the road located about 75m from the affected site. These sell food and provide other refreshments needs for commuters. The noise and vibration from construction machinery operation will clause noise pollution and vibration impacts to the occupants and the commuters seeking their service.

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

There may be disputes with the workers of construction site and the villagers as the people are living nearby.

### **8.2.12 Work camps and lay-down sites requirement**

The solid waste, sewage removal in worker camps if not properly designed will be a nuisance to the surrounding community.

### **8.2.13 Risks of public accessing the site during construction**

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

### **8.2.14 Explosive hazards and hazardous materials**

Affected slope has no large rocks, hence it is highly unlikely that rock blasting will encounter.

### **8.2.15 Road traffic and safety to the public from construction activities**

During construction phase the road will be obstructed by 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 pedestrian passage and may pose high risk on their lives.

There is a risk of falling from upslope during the construction phase as the slope is exposed.

### **8.2.16 Workers safety during construction**

The risk of slope failure is aggravated during the rainy season. This risk is highly significant. The heavy construction machinery may be used in limited work spaces. Risk of 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 result serious accidents and injuries.

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

There are four small business places about 75m from the mitigation site on the opposite side of the road. They will be affected both positively and negatively during the construction phases. The positive impacts will be that they can provide food, accommodation, labour and other facilities to the work force by which they can improve the income. On the other hand the construction activities will cause nuisance, unsafe conditions, abuses, disputes etc. Hence, consultation was done with the owners of the boutiques to make aware of the project, benefits, and the impacts (environmental and social).

### **9.1 Stakeholders involved in the consultations any recommendations or agreements reached in the consultations (Refer annexure III).**

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

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

Since there are no streams closes to the site, the impact will not be significant.

### **10.2 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, (in morning, day time and evening). This will cause nuisance to pedestrians and commuters. **Public safety issues;** as one side of the road will be closed the traffic pressure on the other side will be high. On this side 4 boutiques are there. When one side of the road is closed there will be unsafe (risk of accidents) conditions to people in the boutiques and the commuters who stop the vehicles to have food and refreshment at this site.

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

There are no houses within the project influence area. But 4 small business places are located about 75m from the project site. In these boutiques both males and females are engaged in the business by providing food and refreshment to commuters. These occupants of the boutiques spend their time with the children during business hours. They will be exposed to a wide range of environmental and social impacts during the construction phase such as public safety, air pollution, noise, vibration, nuisance, social issues etc.

### **10.4 Areas used for businesses, agriculture or other within the area to be remediated**

Not required under this project

### **10.5 Areas used for businesses, agriculture or other immediately adjacent to the site**

There will be both positive and negative impacts due to the project. The positive impacts are improvement businesses and some of them will be able to provide labour for the project during the construction period. However there will be negative impacts due to the project (refer section 10.2 and 10.3).

### **10.8 Need for people to enter or cross the site**

As the construction process involves heavy machinery, and vehicles, electricity, and may be blasting materials the entry by unauthorised personnel if occur may have very high risk.

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

The health and safety issues pertinent to this site is significant as the workers have to work on almost vertical unstable slope with a risk of slope collapse. Such common E & HS issues have been discussed in the **ESMF**. Worker safety requirement in the construction site is more detailed under 2003 5: Safety equipment and clothing in the section 2003: Working conditions and community health and safety in the Bidding document.

### **10.10 Child labour & forced labour**

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

### **10.11 Interruption to water supply**

Since there are no water lines close to the site, the impact will be insignificant.

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

### **11.1 Project implementation**

- i. Approval from the District Secretariat  
The approvals will require to be obtained from the District Secretary for the implementation of project where the proposals need to be presented at the District Coordinating Committee, to which chief minister and stakeholder agencies in the district will also participate. The Officer of PMU will present the project, disclose the project details and various concerns including environmental and social 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.
- ii. Approval from the planning committee  
The project will obtain the approval from the planning committee of the Attangalla Pradeshiya Sabha

### **11.2 Approval from the state lands owners to implement the project at the specified site**

- i. The relevant agency is Road Development Authority as part of the project actions are taking place on the road reservations. Necessary agreement will be made between NBRO and the RDA to access the land, carry out construction work, remove materials (trees, soils, rocks and boulders), erect structures, and continue with operation and maintenance works.

### **11.3 Approval from Central Environmental Authority, Department of Forest, Department of Wildlife Conservation**

- i. Approval from environmental authority is not required.
- ii. Approval from Department of Forest, Department of Wildlife Conservation are not needed as the project site is not under or within the buffer zone of a forest reserve.

## 11.4 Other approvals

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

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

Signing a legally bound agreement between the land owners “**Montiketine division of Malwatta Plantation Company**” 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. Allow land owner to extract/ or extraction by the contractor on behalf of the land owner any valuable items from the structures. Project bear the cost of removal of the structures.

The tentative timeline for getting approval is given in the table 1.

Table 1: Tentative timeline for getting approvals

Approvals	Month 1				Month 2			
	W1	W2	W3	W4	W1	W2	W3	W4
<b>Project implementation</b>								
<i>Approval from the District Secretariat</i>								
Submission of application	—							
Project briefing		—						
Respond to comments		—	—	—				
Approvals					—	—		
<i>Approval from planning committee</i>								
Submission of application		—						
Project briefing			—					
Respond to comments				—				
Approvals					—			
<i>Approval from state land owners RDA &amp; CEB</i>								
Submission of application		—						
Respond to comments			—					
Approvals				—	—			
<b>Other approvals</b>								
GSMB		—	—					
Ministry of Defense (Depends on the requirement)								
Consent/ no objection from the private land ownership	—							

## 12. Environmental Social Management Plan (ESMP)

Measures to manage and or mitigate the impacts and risk. Especially the impacts and risks identified in Sections 8 & 9. This section will include the specific recommendations and requirements of the ESMP for design stage, construction phase and maintenance operation phase.

### 12.1 Resettlement action plan

There is no project based resettlement in this site.

### 12.2 Evacuation of people

Since there are no houses identified as risk category evacuation is not required.

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

This risk will not be triggered in this site.

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

This risk may not be triggered in this site.

### 12.5 Public awareness and education- needed for following areas

Programs to inform and educate occupants of the boutiques on the risk of slope failure, public safety, environmental and social issues concerning especially the females and children's safety and social risks, grievance redress mechanism etc.

### 12.6 Design based Environmental/ Social Management considerations

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

Table 2: Design stage Environmental & Social considerations

Design feature	Recommended level of consideration for this site
<b>i. Natural resource management and resource optimized designs</b> 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 if important tree species are found.	Low
<b>ii. Habitat connectivity and animal trails</b> 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 impact are localized.	Low
<b>iii. Conservation of water resources</b> 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 even as drinking water for the people living in the downslope area whose drinking water sources are located much away from their settlements.	Low
<b>iv. Interruption to water supplies</b> If the water in the mitigated slope is used as a source for individual or community water supply, the chance the water source can be affected by the mitigation work is high due to water table draw down. In such instances the design should include alternative source of water for the community (temporary/or permanent).	Low

<p><b>v. Aesthetically compatible design considerations</b> 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.</p>	High for upslope area
<p><b>vi. Consideration of green environmental features</b> 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 &amp; etc.</p>	Low
<p><b>vii. Workers/ commuters and community safety</b> Activation of slide may occur during construction phase and may pose threat to workers and commuters. Therefore, design based safety consideration such as berms, safety nets etc. should be considered</p>	Very high
<p><b>viii. Erosion control structures</b> In drainage management, water is extracted and conveyed to nearby streams often through culverts. During rainy season the flow in these drainage structures can be significantly high and this may cause stream bed and bank erosion. Hence the design should adequately consider flow speed breakers to reduce erosive flows entering natural streams. This should be an inclusive part of the design if there are streams and culverts in the proximity of the mitigation site.</p>	Low
<p><b>ix. Low post maintenance and operation designs</b> 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 and 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.</p>	Very high

## 12.7 Mitigation of impacts during the construction phase

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

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

Table 3: Contractor requirement to comply with ES & HS

Reference No. as per construction contractors obligation to ESMP	Item	Relevant to the project
<b>2002. Environmental and Social Monitoring</b>		
2002.2 1)	Storage on site	Highly Relevant (road reservation)
2002.2 2)	Noise and Vibration	Highly relevant ( nearby boutiques)
2002.2 3)	Cracks and damages to the buildings	Highly relevant (nearby boutiques)
2002.2 4)	Disposal of waste	Relevant
2002.2 5)	Disposal of refuse	Highly relevant (road reservation)



2002.2 6)	Dust control	Highly Relevant (commuters/ pedestrians/ houses)
2002.2 7)	Transport of Construction materials and waste	Relevant
2002.2 8)	Water	Relevant
2002.2 9)	Flora and Fauna	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/ houses/community water supply)
2002.2 18)	Visual environment enhancement	Highly relevant (Aesthetically sensitive road section)
<b>2002-5. Environmental Monitoring</b>	Baseline surveys (air, water, noise , vibration, crack surveys)	Refer site specific monitoring plan
	Surveys during construction (air, water, noise , vibration, crack surveys)	Refer site specific monitoring plan
	Surveys during operation phase	Optional
	Reporting and maintenance of records	Relevant
<b>2003. Working Conditions and Community Health and Safety</b>		
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
<p><b>Relevant:</b> The section is relevant to the site as a common ESMP applicable to any site</p> <p><b>Highly relevant:</b> 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</p> <p><b>Possibly relevant:</b> This ESMP will be triggered if the site come across with relevant aspect during project implementation</p> <p><b>Not relevant:</b> The section may not be relevant to this site under disclosed conditions</p> <p><b>Optional:</b> require to be implement if needed only</p> <p><b>Refer site specific monitoring plan:</b> Contractor is obliged to carry out monitoring as specified in the site specific monitoring plan</p> <p><b>Reference: Contractors Obligation for implementation of ESMP</b></p>		

### 12.7.2 Site Specific mitigation

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

Table 4: Site specific ES & HS mitigation measures

Mitigation item	Project implementation phase	Responsibility
<p><b>i. Minimize erosional impacts during construction</b></p> <p>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.</p>	Site preparation & construction	Construction Contractor
<p><b>ii. Disposal of construction waste</b></p> <p>The contractor should pay special attention with respect to disposal of construction waste. 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 road sides.</p>	Site preparation & construction	Construction Contractor
<p><b>iii. Dust and aerosol control screens</b></p> <p>Special screens etc. should be used if heavy dust or aerosol generating activities are envisaged</p>	Site preparation & construction	Construction Contractor
<p><b>iv. Water for construction</b></p> <p>Water for construction works should be obtained only from the approved sites</p>	Construction	Construction Contractor
<p><b>v. Impacts on transport infrastructure (especially temporary loss of road or rail access, risks of traffic congestion)</b></p> <p>A good traffic control is imperative to this site A traffic management should be planned carefully to minimize the road traffic, congestions and accidents during day and night. The plan should consider</p> <ul style="list-style-type: none"> <li>• obstructions and possible unsafe conditions to the public who will be using the food and refreshment facilities of the close by boutiques</li> <li>• The bend on the road adjacent to the site</li> </ul> <p>Safety measures includes 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.</p>	Construction	Construction Contractor
<p><b>vi. Public safety</b> ( Refer section 12.5)</p>		

<p><b>vii. Priority Health and Safety Issues</b></p> <p>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.</p> <ul style="list-style-type: none"> <li>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.</li> <li>ii. A good warning system and fulltime watchmen is highly recommended for this site for both worker and commuter safety.</li> <li>iii. Safety barriers and safety nets should be installed at places of risk to protect workers and commuters from boulder falling risk</li> </ul>	Construction	Construction Contractor
<p><b>viii. Working hours</b></p> <p>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.</p>	Construction	Construction Contractor
<p><b>ix. Need for people to enter or cross the site</b></p> <p>Possible unauthorized access to the site should be avoided by awareness, warning signs and vigilance by the contractor's full time watchmen.</p>	Construction	Construction Contractor
<p><b>x. During construction good housekeeping</b> should be maintained to minimize visual pollution</p>	Site preparation & construction	Construction Contractor
<p><b>xi. Workers code of conduct</b></p> <p>Possible deutes between the labor force and the villages should be prevented by maintaining the agreed code of conduct by the contractor.</p> <p>Possible disputes between workforce and villages should be avoided especially when using shared resources such as common bathing and washing places etc.</p>	Construction	Construction Contractor

### 12.7.3 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 5: Environmental and Social monitoring plan; construction phase

Monitoring requirement	Parameters	Frequency
i.	Stream water quality	-
	Pre crack survey of the high risk houses	-
	Ground vibration	-
	Air quality: particulate matter	Once*
	Background noise measurement	Once*
ii. During construction	Stream water quality	-
	Crack survey of the high risk houses	-
	Ground vibration	-

	Construction noise	During high noise generation activities are operated
	Air quality particulate matter	During high air emissions are generated
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	<b>Stream water quality</b> – Comparison with ambient water quality standards published by the CEA, 2017 <b>Pre crack survey of the high risk houses</b> -Professional report <b>Ground vibration</b> -as per The interim standards on vibration for the Machinery, Construction activities and Vehicular movements, CEA <b>Background noise measurement</b> –Extraordinary Gazette No.924.1, May 23,1996, CEA <b>Air quality particulate matter</b> - The National Ambient Air Quality standards stipulated under the Extraordinary Gazette, No. 1562/22 August 15, 2008 -Central Environmental Authority of Sri Lanka.	

### 13. Grievance redress mechanism for this site

The consultants ES officer is responsible for establishing the grievance redress mechanism for this site for impact communities.

### 14. Information disclosure

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

Table 6: Proposed scheme of information disclosure

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

Table 7: Level of information gathered through consulting institutions

Date	Institution	Person contacted for information
26/10/2018 @ 13.30 hrs	Road Development Authority – Nittambuwa	Mr.Manjula Karunanyake Executive Engineer Nittambuwa
26/10/2018 @ 14.30 hrs	Central Environmental Authority	Mr.Chathura Malwana Director District office Gampaha–

**Annexure I: Drone Image of the project area**



Landslide Risk area.

**Annexure II: Images of the site condition and the consultation (photographs of boutiques need to be added)**



*Fig a: Current appearance of the road bend in landslide area*



*Fig b. Nearby boutiques in landslide area*



*Fig c: Gathering Information and viewing surrounding area*



*Fig d: Gathering Information about the history of the landslide from Villagers.*



*Fig e:: Consultation with state superintends wife (State superintend – Dinesh Thisa Pathirana.)*



*Fig f:: Consultation with K.A.R. Senevirathna, Director CEA, Gampaha District.*

### Annexure III -Report on the Stakeholder Consultation: Kegalle District

Date: 13/09/2018 and 03.10/2018		
Institution	Name and designation of the contact officer	Concerns raised
Road Development Authority Nittambuwa	Mr. Manjula Karunanayake	<ul style="list-style-type: none"> <li>✓ This area is under the jurisdiction of RDA – Nittambuwa</li> <li>✓ The Executive Engineer Office has no objection and states the mitigation is very much needed.</li> <li>✓ Other concerns raised               <ul style="list-style-type: none"> <li>• 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</li> <li>• A proper handing over of the project is required after the mitigation</li> <li>• Engineer Office will do the maintenance after mitigation</li> </ul> </li> </ul>
Central Environmental Authority	Mr.Chathura Malwana Director- Gampaha district	<ul style="list-style-type: none"> <li>✓ The Basic Information Questionnaire (BIQ) is needed to fill for the project and submit the application</li> <li>✓ The CEA will grant approval with recommendations.</li> </ul>



**Annexure IV: 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 conditions 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 emphasised 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

**2. Proposed approval procedure for Environmental Clearance form District Central Environmental Authority**

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

## **Annexure V: Study team**

<b>Name</b>	<b>Designation</b>	<b>Position in the study</b>
TDSV Dias	Director/ ESSD/NBRO	Team leader
SAMS Dissanayake	Senior Scientist/ESSD/NBRO	Senior Environmental Scientist
Prabath Liyanaarachchi	Scientist/ ESSD/NBRO	Environmental scientist
H Kusalasiri	Technical Officer/ESSD/NBRO	GIS/Demographic data /survey support
D.L.U. Jayawardana	Scientist /LRRMD/NBRO	Geologist

## **Annexure VI: List of references**

1. NBRO Landslide Hazard investigation report on Veyangoda –Ruwanwella road
2. Contractor’s obligations for Generic Environmental and Social Management Plan- Sri Lanka Landslide Mitigation Project-AIIB
3. Environmental and Social Management Framework-Sri Lanka Landslide Mitigation Project \_AIIB
4. Resettlement Planning Framework- Sri Lanka Landslide Mitigation Project \_AIIB