Initial Environmental Examination

July 2018

Sri Lanka: Science and Technology Human Resource Development Project: Sabaragamuwa University of Sri Lanka —Proposed Faculty of Technology Building Complex

Prepared by Total Management Solutions for Sabaragamuwa University of Sri Lanka for the Asian Development Bank.

CURRENCY EQUIVALENTS

(as of 11 July 2018)

Currency unit	–	Sri Lanka rupee/s (SLRe/SLRs)
SLRe1.00	=	$0.006278
$1.00	=	SLRs159.27

ABBREVIATIONS

ADB	–	Asian Development Bank
AP	–	affected person
BD	–	Building Department
BIQ	–	Basic Information Questioner
BO	–	built operate
BOQ	–	Bill of Quantities
CAP	–	Corrective Action Plan
CEA	–	Central Environmental Authority
CEB		Ceylon Electricity Board
COC	–	Certificate of Conformity
DBO		design-built-operate
DM	–	Disaster Management
DMC	–	developing member country
DOF	–	Forest Department
DPC		dam-proof course
DSD	–	Divisional Secretariat Division
EHS	–	Environmental, Health and Safety
EIA	–	Environmental Impact Assessment
EMP	–	Environmental Management Plan
EMP	–	Environmental Monitoring Plan
EPL	–	Environmental Protection Licenses
ESIA	–	Environmental and Social Impact Assessment
FT	–	Faculty of Technology
FTP	–	Faculty of Technology Project
GND	–	Grama Niladari Division
GRC		Grievance Redress Committee
GRM	–	Grievance Redress Mechanism
HSE	–	Health, Safety and Environment
IEE	–	initial environmental examination
ILO	–	International Labor Organization
IP	–	indigenous peoples
IPS		Imbulpe Pradeshiya Saba
IR	–	involuntary resettlement
LFS	–	Labour Force Survey
M&E	–	monitoring & evaluation
MHECA	–	Ministry of Higher Education and Cultural Affairs
MMDE		Ministry of Mahaweli Development and Environment
MOH	–	Ministry of Health
MSL	–	mean sea level
NEA	–	National Environmental Act
NIRP	–	National Involuntary Resettlement Project
NPPD		National Physical Planning Department

NWRB	–	National Water Resources Board
NWSB		National Water Supply and Drainage Board
PAA	–	Project Approving Authority
PBC	–	performance-based contracts
PIU		project implementation unit
PMC		project management consultant
PMU		project management unit
PP		project proponent
RBA		Rapid Biodiversity Assessment
REA	–	Rapid Environmental Assessment
SEP		Site Environmental Plan
SLEC		State Level Empowerment Committee
SLLRDC	–	Sri Lanka Land Reclamation and Development Cooperation
SPS	–	Safeguard Policy Statement
STHRDP	–	Science and Technology and Human Resource Development Project
SUSL		Sabaragamuwa University of Sri Lanka
TA	–	technical assistance
TDP		Technology Stream Degree Programmes
TMS	–	Total Management Solutions
UDA	–	Urban Development Authority
VEC	–	Valued Environmental Component
WASSIP	–	Water Supply and Sanitation Improvement Project

NOTE

In this report, "$" refers to US dollars unless otherwise stated.

CONTENTS

EXECUTIVE SUMMARY

Government of Sri Lanka with loan funding from Asian Development Bank (ADB) has proposed to implement Science and Technology and Human Resource Development Project (STHRDP). This project aims to increase the technology-oriented workforce to transform Sri Lanka's growing economy by supporting a series of Universities across the country. The objectives of the IEE are to:

a. Determine the category of the subproject depending on improvement proposal, environmental sensitivity and magnitude of impacts, i.e. screening as per Government of Sri Lanka's regulations and ADB's Safeguard Policy Statement 2009;
b. Determine the requirement of statutory clearances;
c. Baseline environmental monitoring and survey; and
d. Predict impacts on relevant environmental attributes and mitigation measures to minimize the impacts.

The subproject. The proposed faculty of technology (FT) development project is located in Imbulpe DS Division in Rathnapura District, Sabaragamuwa Province, Sri Lanka. Establishment of a Faculty of Technology (FT) will generate new employment opportunities for the local community as well as improve skills and training in the engineering technology and bio system technology fields. Thus, it will simultaneously contribute to improvement of education in whole country while improving opportunities for employment. Bachelor of Bio systems Technology (BBST) and Bachelor of Engineering Technology (BET) aiming at enrolling 150 students annually to contribute for the national development aligned with the country's development strategies.

The first phase of the FT will compose of four lecture halls, a computer laboratory, laboratories for physics, chemistry and biology, office for dean, two departments and academic staffs. Subsequently, the second phase of building construction will be considered to facilitate more lecture halls, third and fourth year laboratories, additional staff rooms, common area, reading rooms etc. A total of 98, 574 sq. feet will be developed under Phases 1 to 3 construction of the FT of which Phase 1 will be 40,610 sq. feet. The estimated cost is USD 2,572,656 for the whole subproject which will be funded by ADB. There is no government contribution for this subproject.

Description of the Environment: FT development subproject is located in Imbulpe in Rathnapura District within the current SUSL premises. The location coordinates are $6^0$42'33.33"N, $80^0$47'35.17"E longitude. The university is located alongside B 593 - Pambahinna-Kumbalgama-Rajawaka-Kapugala Road which connects to the main Colombo – Batticaloa Highway (A4). The proposed subproject site is within the current University premises.

The surrounding environment is mountainous and forested. The SUSL is located in the former Smanalawewa development project premises handed over to SUSL which already cleared and developed. The proposed location of 2.4ha currently consists of a secondary moist semi-evergreen forest. According to SUSL, only 0.38ha will have to be cleared for the development of the FT. The biodiversity prevailing in the subproject area is of importance due to its location in a bio geographical transition between the wet zone to the west and the dry zone to the east, being located in a thin strip of the intermediate zone. Therefore, a rapid biodiversity assessment was recommended and carried out. The findings of the assessment reveal moderate levels of species richness in selected plants and animals. However, the proportions of endemic and/or threatened species in the subproject site and its periphery are not of critical levels.

Policy, legal and administrative framework and sub project categorization. As per the ADB's Safeguards Policy Statement of 2009 and based on the REA Checklist of ADB classification, the FT is categorized under environment Category B. Since the site was a forested patch, to be in line with the SPS Environment Policy Principle 8 a rapid biodiversity assessment was carried out for the subproject site. Principle 9 triggered a gap in the national legislations where IFC-WB EHS standards were more stringent over the national standards.

ABD IP and IR safeguards are not triggered under this subproject. No land acquisition was carried out in anticipation of ADB financing. The subproject site is the owned by SUSL.

According to the BIQ and IEE/EIA environmental guidelines of Central Environmental Authority of Sri Lanka (CEA), the proposed subproject falls in to the non-prescribed category. Therefore, environmental clearance (EIA or IEE) will not be required from the government of Sri Lanka to proceed. However, environmental and other clearances from Government of Sri Lanka will have to be obtained prior to commencement of the subproject and have been identified in the IEE. The IEE was carried out as a requirement of ADB under its safeguards policy to be eligible for their financing.

Analysis of Alternatives: Alternatives to location were not considered as the subproject site is strategically located within the SUSL complex. Alternatives to design will have to be considered to accommodate the forested nature of the environment and the mountainous landscape.

Public Consultations: A stakeholder consultation was held on 1st May 2018 and was attended by 23 people including government officers, members of the nearby villages, students and staff. The main concern that was highlighted at the meeting was the management of solid waste and sanitation effluent. No major concerns were raised at the meeting. The public participation processes undertaken during subproject detailed design ensure that stakeholders and affected people are engaged during the preparation/finalization of the IEE. Upon follow up interviews with the MOH office and other sources, it became evident that there were water pollution issues identified due to current SUSL practices which will need to be resolved.

Monitoring and reporting: PMU will prepare quarterly monitoring reports; environmental monitoring report will be submitted by the MHECA to ADB semi-annually during construction and annually post-construction. Social monitoring reports will not be required as IR is Category C and IP safeguards are not triggered.

Grievance Redress Mechanism: The subproject will follow the GRM process identified in the IEE. Assessment of the existing GRM shows that it has provided citizens with an effective platform for redress of their grievances. This IEE describes the existing GRM including informal and formal channels, time frame and mechanisms for resolving complaints about environmental performance.

Anticipated Impacts and Mitigation Measures: A summary of the potential environmental impacts during the construction and operation phases along with recommended mitigation measures are provided in the IEE in the form of an EMP. The FT subproject is unlikely to cause significant adverse impacts because: most predicted impacts are localized and likely to be associated with the construction process with is temporary. Also, the subproject will adopt mitigation measures against deterioration of the natural environment and for waste management which are the main concerns associated with the subproject.

Recommendations: The EMP and associated NBRO, CEA, UDA guidelines should be followed during construction activities. SUSL needs to revise the geotechnical report considering the proposed plan and the load that is transferred was not in place at the time of the investigation.

SUSL should engage with NBRO for measures to prevent landslides and, CEA and the UDA to incite the green building designs.

SUSL should consult the Meteorology Department prior to construction and obtain records of the wind flow and design the building accordingly. SUSL should consult local MOH office and address wastewater leachate issues being taken up by the community. Support conservation practices and carry out minimal tree removal for the development activity as identified in the biodiversity assessment. Further detailed recommendations are provided in the IEE, but the IEE is based on preliminary design and will be updated once detailed engineering design is developed.

Conclusion: The IEE study did not find any adversely significant incompatibility with the surrounding physical, biological, socio-economic or cultural environment and does not pose any significant long-term environmental threat if managed properly during construction and during implementation. However, wastewater/sewerage leachate polluting waterways due to the current SUSL operation as indicated by the MOH office should be addressed immediately and resolved.

For the FT development subproject, the GRM and EMP provide appropriate guidance for suitable environmental and social safeguards. Accordingly, the proposed subproject can be recommended for implementation with strict adherence to EMP and GRM provided in this IEE ensuring that it does not contribute to the aggravation of any existing issues. Most of the adverse impacts of FT during construction period are short term and temporary in nature. The biodiversity which is moderate in the FT site should be conserved to the extent possible.

I. INTRODUCTION

A. Subproject Background

1. In Sri Lanka, the service sector, financial activities, transportation and real estate activities have shown a significant year to year (YOY) growth together with activities such as IT/BPO and telecommunications. In the ICT services sector, IT programming consultancy and related activities has grown significantly by 21.1% YOY in 2015[1]. Successive governments in Sri Lanka have promoted the concept of a 'knowledge-based economy', particularly during the past two decades.[1,2]

2. The International Labour Organisation publication titled 'The skills gap in four industrial sectors in Sri Lanka' has identified major skills mismatches especially in the high-skill job categories in the ICT, tourism & hospitality, construction and light engineering industries[3].The Faculty of Technology (FT) of Sabaragamuwa University of Sri Lanka (SUSL) was established in 2018 to make a significant contribution to meet the human resource needs of Sri Lanka. The FT has introduced latest teaching and learning methodologies to its undergraduate students. The FT will train graduates who are ready for industries such as bio system technology and engineering technology services.

3. Government of Sri Lanka with loan funding from Asian Development Bank (ADB) has proposed to implement the Science and Technology and Human Resource Development Project (STHRDP). The Ministry of Higher Education and Cultural Affairs (MHECA) will be Executing Agency and SUSL shall be the Implementing Agency. This project aims to increase the technology-oriented work force which will contribute to transform Sri Lankans growing economy. Under this subproject the SUSL will build a new Faculty of Technology (FT) in Sabaragamuwa University of Sri Lanka. This will be referred to as the subproject in this report.

4. The safeguards screening for SUSL has been completed by the consultants mobilized under TA8235 with recommendation for a biodiversity assessment.

5. The proposed feasibility study and the detailed designs of the FT at SUSL proposes Phases I and II, both to be financed by ADB. Phase 1 includes basic laboratories, lecture halls, staff offices, basic research facilities, welfare facilities and auditorium.

6. FT at SUSL aims at establishing industry-specific skills and soft skills among its graduates, improving and initiating liaisons with the industry and inculcating innovation into the teaching and learning environment. The FT will train graduates who are ready for industries such as Bio System Technology and Engineering Technology. At the moment university has not started their intake because they do not have enough resources. At the end of five years, (2020) the Faculty will accommodate about 450 students in total. See Table 01 for subproject intake.

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1 Mahinda Chinthana, 2005, Government of Sri Lanka
2 An Empowered Sri Lanka, 2016, Government of Sri Lanka
3 The skills gap in four industrial sectors in Sri Lanka, 2015, International Labour Organisation

Table 1: Intake of Students

Projected intake number of students (Technology Faculty)												
Years		2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2027
Degree Program												
Bachelors	Engineering Technology	75	75	75	75	100	100	100	100	100	100	120
	Biosystem Technology	75	75	75	75	100	100	100	100	100	100	120
Masters	Engineering Technology					25	25	25	25	25	30	30
	Biosystem Technology					25	25	25	25	25	30	30
PhD	Engineering Technology							5	5	5	5	8
	Biosystem Technology							5	5	5	5	8

B. Objectives of the IEE

7. The objectives of the Environmental Study are to:

- Determine the category of the subproject depending proposal, environmental sensitivity and magnitude of impacts, i.e. screening as per Government of Sri Lanka's regulations and ADB's Safeguard Policy Statement 2009;
- Determine the appropriate scoping required
- Determine the requirement of statutory clearances;
- Provide a baseline environmental monitoring and survey; on biodiversity, biophysical resources
- Predict impacts on relevant environmental attributes and mitigation measures to minimize the impacts.

8. Recommendations will be provided for mitigating any negative impacts wherever possible through the EMP. The EMP will include the recommended institutional arrangements for

monitoring activities for identified environmental issues. The IEE will address current physical, ecological, economic and social background of the subproject anticipated environmental impacts that will arise due to subproject activities, necessary measures that have to be adopted to mitigate them and public views and suggestions regarding the subproject.

9. Accordingly, a single consolidated IEE report will be submitted to ADB and also be made available to the PP to facilitate their decision making.

C. Approach and Methodology

10. The IEE has been carried out within the existing policy, legal and administrative framework considering the applicable environmental legislation, regulations & guidelines of ADB and MOMDE.

11. **Reconnaissance Survey:** A reconnaissance survey was carried out identify the value environmental components surrounding the subproject. Location of environmentally protected areas; surface water bodies; environmentally sensitive receptors (educational institutions, religious structures, medical facilities etc.) at the subproject site was identified during the survey. The Consultant conducted preliminary analysis of the nature, scale and magnitude of the impacts that the subproject is likely to cause on the environment, especially on the identified Valued Environment Component (VECs). REA, IP and IR checklists findings were also incorporated in the preparation of the IEE. Site inspection of proposed subproject was carried out on 23rd March 2017 (refer Annex 01 for details).

12. During the inspection, activities such as assessment of the existing location and the surrounding environment identification of sensitive areas, consultation with the local officers, key informant interviews were carried out. Other reliable information was collected from villagers and respective authorities during public consultation meetings. Secondary information for the report was gathered from printed materials and other sources of the relevant Government Departments, Authorities, Divisional Secretariat and relevant websites.

13. Another study will be carried out to analyze and identify the demand for technology graduates in the labor market to justify the public investment in the technology education and on proposed FT subproject. This will be carried out by ADB separately.

14. **Data Collection & Review:** Secondary data such as Survey of Sri Lanka Topo Sheets, District Planning Maps, etc. have been collected from various secondary sources. Further, secondary data, which are relevant to understand the baseline as pertaining to physical and biological environments has been collected and reviewed. Applicable environmental legislation, regulations and guidelines of ADB and MOMDE have also been reviewed.

15. **Environmental Screening & Scoping:** Screening has been conducted with specific consideration such as location of the subprojects with respect to close proximity to highly biodiversity regions and the waste management issue prevalent. It will help to modify the designs at locations where impacts can be avoided and incorporate mitigation measures wherever the impacts were unavoidable due to other constraints.

16. **Baseline Environmental Monitoring:** To establish the baseline environmental status, it is recommended that monitoring would have to be carried out for various environmental parameters such as meteorology, ambient air quality, ambient noise level, ground & surface water quality and soil quality at the subproject site. Secondary data was referred from numerous

reports for current IEE. A rapid biodiversity assessment was recommended and carried out to assess the importance of the biodiversity surrounding the subproject site by SUSL.

17. **Stakeholder Consultation:** Stakeholders' workshop to analyze the technology degree program offered at SUSL was organized on the 1 May 2018 and held at the Board Room of the Vice Chancellor's office. Consultations on environmental and social issues were carried out with relevant stakeholders identified through stakeholder analysis. Such consultations were done with the officials and staff of SUSL and students, Divisional secretary in Imbulpe DSD, Grama Niladari in Muththettuwegama, and immediate neighbors from the adjoining properties. Further, interviews were carried out separately with other officers not preset such as the MOH office.

D. Structure of IEE Report

18. In order to fully meet all requirements, the IEE report generally follows the ADB Safeguard Policy Statement 2009 and EA Guidelines 2003. Structure of the IEE report is organized as follows:

Part I. IEE Report
Executive Summary
Chapter 1- Introduction
Chapter 2- Description of the Subproject
Chapter 3- Policy, Legal, and Administrative Framework
Chapter 4-Description of the Environment
Chapter 5-Analysis of Alternatives
Chapter 6-Anticipated Environmental Impacts and Mitigation Measures
Chapter 7-Public Consultation
Chapter 8-Grievance Redress Mechanism
Chapter 9- Environmental Management Plan
Chapter 10-Conclusion and Recommendation

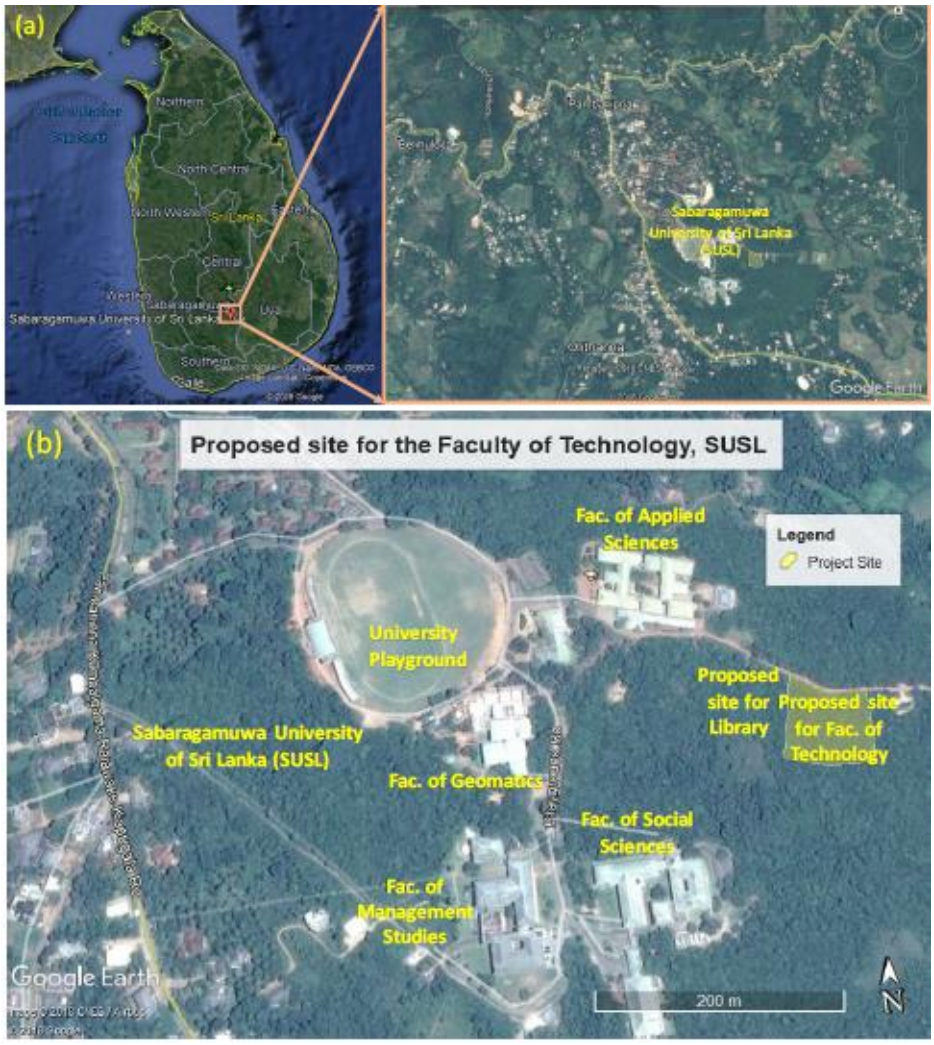
Part II. Annexes
Part III. EMP

II. DESCRIPTION OF THE SUBPROJECT

A. Subproject Location

19. The proposed construction of the new FT is located in Imbulpe Divisional Secretariat (DSD), Ratnapura District in the Sabaragamuwa Province, Sri Lanka. The proposed subproject site is situated within the existing SUSL complex. The land location points are $6^0$42'33.33"N, $80^0$47'35.17"E. The subproject site is located close to the Colombo Batticaloa highway (A-4) and is 1km from the Pambahinna Junction and 1.5km from Belihul Oya town. The closest city is Balangoda which is 20km from the site. See Figure 1 for site location.

Figure 1: Site Location



Source: RBA Report prepared by SUSL, 2018.

20. The land is composed as one plot in the survey plan (see Annex 02). On the eastern boundary lies the proposed student center and southern boundary the proposed waste and sewage disposal plant. The western boundary adjoins the proposed library complex at SUSL.

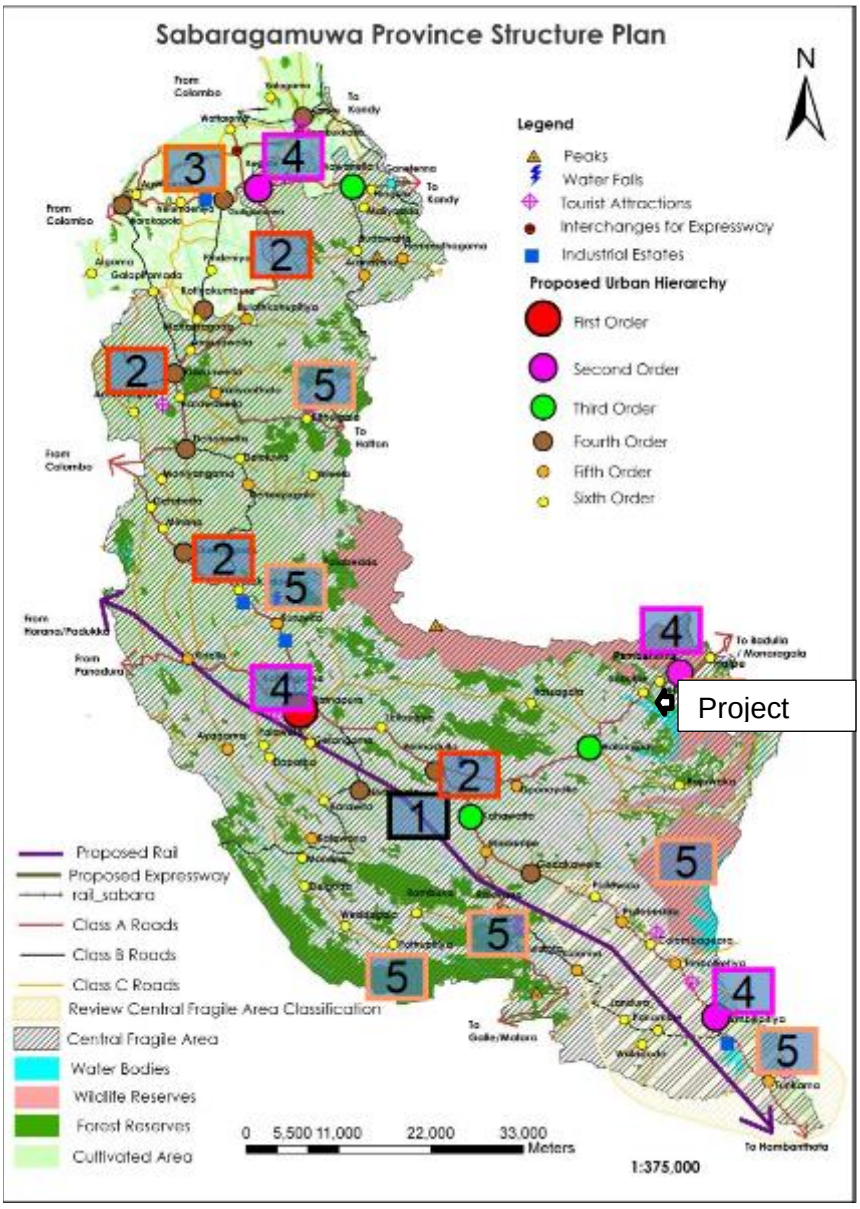
These details are shown in the attached site master plan (Annex 03). The way to the prosed site is shown in Figure 2.

Figure *2*: Way to proposed FT Site

21. There are no significant environmentally sensitive receptors in the immediate surrounds of the subproject site. The only possible such receptors would be the SUSL community, the closest functional building being 500 m from the site.

22. The subproject is identified as sixth order urban center according to the Sabaragamuwa Provisional Zonation Plan by NPPD which essentially identifies it as the lowest order township. The FT subproject location is roughly marked in Figure 3.

Figure 3: Sabaragamuwa Provincial Structural Plan



B. Description of the Subproject

23. The government granted SUSL approximately 232 acres as below:

- Main university premises transferred by the Ceylon Electricity Board -66 acres
- Main playground and building complex premises –56 acres
- University Farm premises –31 acres
- Non-Perennial land –50 acres
- Other lands –29 acres

24. This land was formerly used for the Samanala Wewa Dam project. Gazette notification of transfer is provided in Annex 04. The subproject areas is about 6 acres and is rectangular in shape. The land use pattern in and around the project site is rural with predominately agricultural. Project surrounding land can be categorized into residential, commercial, industrial and agricultural. The immediate adjoining plots are currently not developed. There are no permanent or temporary structures at the subproject site. The site comprises a patch of moist semi-evergreen forest which is s secondary forest which has developed after the land was transferred to SUSL. Some photos of the site are shown **in Figure 4.**

Figure 4: Plates of Project Site

Source: Captured by TMS.

25. The proposed FT project will involve construction of a new faculty with facilities to conduct lectures for technology students. The FT will develop under three phases and exact number of stories will be determined based on the requirement provided by SUSL. The proposed new faculty buildings will be designed according to modern architecture designs. The laboratory facilities will involve careful consideration of critical elements such as temperature and humidity control, air pressurization, sound and vibration, contamination control, ventilation, air quality, worker safety, and energy conservation. The indicative requirement for buildings in Phase I is provided in Table 02.

Table 2: Indicative requirements for Buildings (Technology Faculty)- Phase 1.

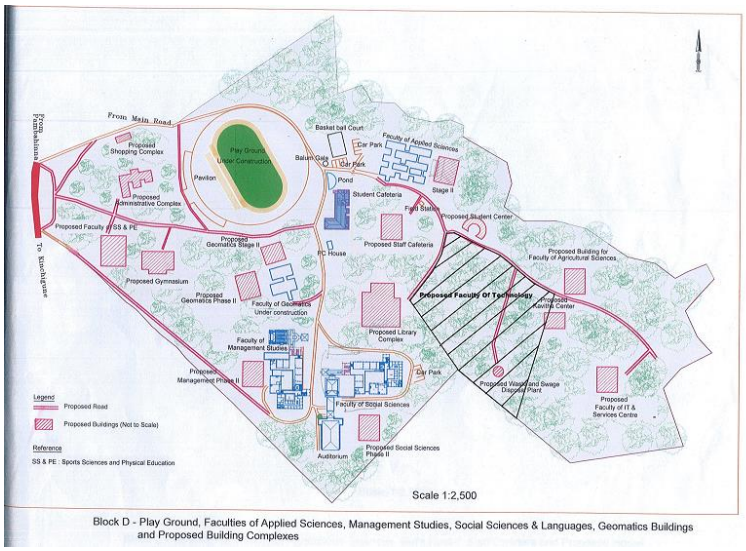
Indicative requirements for Buildings (Technology Faculty)- Phase 1			
Spaces	**Seating Capacity**	**Floor Area in Sq. Ft**	**Number of Rooms**
Class rooms	100	2000	4
Computer laboratory	100	3000	1
Chemistry lab (100 students)	100	3400	1
Physics lab	100	3120	1
Biology lab	100	4650	1
Staff rooms	1	120	24
Departments	4	700	2
Dean office	6	2460	1
Reading room	50	1200	2
Student common room	50	800	1

Auditorium	200	5000	1
Computer admin office		200	1
Staff common/dining room	650	650	1
UI Collaboration center	25	1850	1
Library	50	3230	1
Exam halls	100	4000	2
Cafeteria	50	3230	1
Security office	10	1000	1
Other (25%)			
TOTAL AREA		**40610**	
Car park	**30**	**225**	**30**
Indicative requirements for Buildings (Technology Faculty)- Phase 2			
Spaces	**Seating Capacity**	**Floor Area in Sq. F**	**Number of Rooms**
Class rooms	100	2,000	4
Mechanical Lab	40	5,000	1
Electrical Lab	25	2,500	1
Automobile Lab	25	2,500	1
Biotechnology Lab	50	2,600	1
Pharmacology Lab	25	2,150	1
Bioenergy Lab	25	2,500	
Microbiology Lab	50	2,600	1
Workshop	25	2,000	1
Staff rooms	1	120	30
Staff rooms with attached washrooms	1	150	10
Reading room	50	1,000	1
Conference and Journal office	100	2,692	1
Generator house		600	1
Commercialization center	15	2,000	1
Other (25%)			
TOTAL AREA		**30,412**	
Indicative requirements for Buildings (Technology Faculty)- Phase 3			
Spaces	**Seating Capacity**	**Floor Area in Sq. F**	**Number of Rooms**
Nano Tech Research Center	25	2,475	1
Robotics Research Center	40	1,600	1
Measurement Research Center	25	1,950	1
Food Technology Research Center	50	2,600	1
Pharmaceuticals Research Center	25	2,850	1
Energy Lab	25	2,500	1

Class rooms	25	500	6
Staff rooms	1	120	6
Reading room	50	1,930	1
Vehicle workshop		5,000	1
Other (40%)		6,000	
TOTAL AREA		**27,525**	

26. SUSL had not appointed an architect for the detail engineering designs at the point of the IEE. Only available information is the estimated details prepared by the FT staff at SUSL. The Master Plan is shown in Figure 5.

Figure 5: Master Pan



27. The site plans and 3D views will be developed later.

28. The FT will be designed based on the green building concept/LEAD certification that includes energy saving systems such as inverter type air conditioning, LED lighting and rain water harvesting. The wastewater that is generated from the facility will be directed to a treatment plant and then released for irrigation within the premises. The building structure will be designed on a slab and beam with Alume Zinc roofing (marine quality). All doors and windows will be powder coated aluminum. Other design considerations include fire safety, air conditioning, septic tank for collection of waste water and sewage.

29. **Wastewater and sewage treatment:** The current SUSL domestic waste water and sewage that has been collected and disposed an open waste sludge tank within the university premises. The unregulated disposal of sludge has caused the leachate to pollute the ground water table and the surface water in the adjoining villages. Therefore, special attention and priority need to be given to the establishment of the wastewater treatment facility and sewage management. Before discharge, treated water quality should conform to regulations No. 1534/18 dated 01.02 .2008 and SLSI standards for wastewater and sewage effluent to IFC-WB EHS standards which is required under ADB specifications.

30. **Road side drain**: Roadside drains shall generally be provided on both sides of the embankment to safely carry the discharge from the embankment without eroding the road.

31. **Utilities**: To facilitate utilities to the FT which may include electric lines and poles, fiber optics, waterlines, etc., sufficient space should be provided on both sides of the access road. The size of pipes to carry utilities will be based on FT occupancy size and utilities needed.

32. **FTP improvement proposal:** The primary objective of the proposed FT at the SUSL is to exploit the Technology Stream Degree Programmes (TDPs) for training graduates who have the capacity to contribute to the country's technological advancements and initiatives. SUSL has developed two-degree courses that practices student cantered teaching and learning environment, where the undergraduate will be given more time to practice and develop skills to create and develop new products. As per government policy, this degree programs will be able to produce graduates who can make significant contribution to economic development of Sri Lanka. There will be more reforms within the FT university system such as:

- Implementation of modern teaching practices; rather than the conventional practices. students will be placed in industrial training and research projects.
- Establishment of expedient collaborations with the industry: this will help the students to receive continuous mentoring from the industry that will provide them the competency to enter the job market.

33. The curriculum at the new FT composed of fundamental science courses and related practical sessions developed to train a technical officer with scientific background. Therefore, FT will involve the privet sector in Sri Lanka It will encourage specialists from privet sector to visit the faculty and conduct research and development discussion or workshop with students. This will allow the students acquire modern skills and training. It is essential to important to plan the faculty building complex to allow the practice of new teaching methods. The FT will develop a research development center onsite for areas such as nanotechnology, robotics, automobile, energy resources technology, biotechnology, food technology etc. This will be planned in the third phase of the building plan.

34. **Development of infrastructure**: Under the FT teaching and research buildings will be established at the site. The FT at the SUSL has pioneered new teaching and learning approaches with practical assessments and industrial placement. Therefore, the laboratory and the academic building at the FT will be developed with educational equipment that caters for these specific requirements.

35. **Building safety design and devices**: The building must have built-in alternative emergency evacuation routes for speedy evacuation of occupants during an emergency. In case of a major fire, the building components should withstand the fire for a nominated time period without a catastrophic failure occurring until all occupants safely vacate the building. Fire Precautions for Buildings: During the building design the Code of Fire Precautions for Buildings would have to be applied i.e. ICTAD Publication No. ICTAD/DEV/14 that deals with the regulations on fire prevention in a building. There are many more periodic maintenance requirements to be fulfilled to ensure structural integrity, user safety and internal hygienic environment of the building. Apart from the above the manual on 'Energy Savings in Buildings' developed by Sri Lanka Sustainable Energy Authority and the Construction Material Specifications developed by the former Institute for Construction and Development should be referred. The building should have fire safety mechanisms installed. The portable and built-in

fire-fighting equipment and apparatus must be in place at correct locations and at optimal operational levels for the fire brigade to control the fire.

36. **Sources of Construction Materials**: Soil and material investigation for a FT is very essential to assess the availability of suitable construction material in the vicinity of the project. This includes investigation of suitable borrow area for borrowing earth and quarries for stone /aggregate material and also for the other construction materials like cement, steel, sand, soil etc. ICTAD/DEV/17R specification will provide the guidance on site investigation for building and civil engineering works.

- **Cement**: Local and imported cement in bag or bulk form is available for construction. Cement shall conform to SLS 107 for building. Normal Portland cement can be used for the construction however this should be based upon the recommendations of the geotechnical report.
- **Cement block & clay bricks**: these should be tested according to SLS 847 and SLS 39 for compressive strength, dimensions and water absorption.
- **Steel**: High strength deformed bars manufactured by various steel manufacturing companies conforming to SLS standards are available. Before incorporation into the work, steel should be approved by the Engineer.

37. **Quality Control of Earth Work**: This includes excavation, filling and leveling of the earth work. The failure of quality control of earth works in building construction sites would lead to ground subsidence, cracks and structural failure in a part of or whole building. To minimize the delay during progress of earth filling work, it is necessary to select borrow materials well in advance to the earth filling work because it will take a considerable time duration for selecting, testing, obtaining approval etc. of borrow materials. For this purpose, liaise with NBRO and GSMB. According to the site condition, it is necessary to select suitable machines for spreading, leveling and compaction. The capacity of the machine and size of the blade are important factors for selection. After completion of each layer of compaction, dry density has to be checked as specified in the specifications. The failures of earth compaction compliance with the specifications may cause future settlements, erosions or subsidence.

38. **Cost of the Project**: The total cost estimated for major items associated with the proposed project (including earth work, pavement, drainage structures and construction of buildings) have been established by application of appropriate unit rates to the estimated work item quantities derived from the results of surveys, test results and design analysis for the project. The estimated cost is USD 2,572,656 for the whole project which will be funded by ADB (See Table 03 for breakdown).

Table 3: Cost estimates for complete FT -2018

Item No.	Category	Estimated Cost LKR	Estimated Cost USD
1	Furniture	25,871,000.00	165,840
2	Electronic	18,907,000.00	121,199
3	Lab equipment	206,391,573.00	1,323,023
4	Library books & Software	1,500,000.00	100,000
5	Vehicles	41,000,000.00	262,821
6	Building preparation	24,500,000.00	589,774
7	Curriculum Development	1,500,000.00	10,000
	Total	**319,669,573.00**	**2,572,656**

III. POLICY, LEGAL, AND ADMINISTRATIVE FRAMEWORK

A. Applicable Local Environmental Legislations

39. In Sri Lanka, there are over 70 laws that directly or indirectly relate to protecting and conserving the natural environment and human health. While most of these laws address specific issues pertaining to environment in the respective sector, it was the introduction and enactment of the National Environmental Act (NEA) that provided the overarching legal basis for regulation of pollution and protection of the environment in a comprehensive manner.

40. The following section outlines the broad legal and institutional framework in Sri Lanka for environmental management, relevant to the proposed project. The legislations relevant to the project are listed below. Further details are provided in Annex 05. This project comes under the purview of the following sector level Acts. The EPL procedure under the CEA is explained in Annex 05 along with the rest of the laws that are listed below:

- **The Constitution of Sri Lanka** (Articles 18, 27(14), Articles 154 (A), 9, 19 and (III) 17). Covers environmental governance at the provincial level. In the event of public nuisance / grievance this becomes applicable to address the court of law.
- **National Environmental Act** No. 47 of 1980 (and its amendments of 1988) EIA is covered under this Act. This is discussed separately below since this is the main environment regulatory enactment.
- **Disaster Management Act** No. 13 of 2005. Comes into force in case of a national or regional level disaster. This is relevant due to potential landslide risk.
- **Pradeshiya Saba Act** No. 15 of 1987. Regulates the planning and zonation of the region. This will be relevant for obtaining planning approval for the sub project.
- **Flood Protection Ordinance**, Act No. 22 of 1955. Controls and protects the water shed area of a catchment.
- **State Land Ordinance**, Act No. 13 of 1949 and Land Acquisition Act No. 09 in 1950 and subsequent amendments in 1983 1nd 1986, and Land Acquisition regulation of 2008- Relevant for land transfer from state to state agency.

- **Soil Conservation Act**, No. 25 of 1951. Relevant for the soil conservation in agricultural lands associated with catchment areas. To protect from further degradation.
- **Forest Ordinance**, No 17 of 1907 (and amendments). Provides protection to forested areas. Important as subproject is sited in close proximity to several Reserves and a catchment area.
- **Mines and Minerals Act** No. 33 of 1992 – Relevant for the extraction of building material from the natural environment,
- **Fauna and Flora Protection Ordinance**, Act No. 49 of 1983 – Protection and management of wetland fauna and flora at site.
- **National Water Supply and Drainage Board Law** of No. 2 of 1974 – supply of water for the sub project.
- **Prevention of Mosquito Breeding, Act** No. 11 of 2007 – to ensure that the site is free of mosquitoes related habitats as this is an area identified for dengue epidemics.
- **The Urban Development Authority**, Law, No 41 of 1978- regulates the zonation of the Sabaragamuwa Urban development. Provides guidelines for the FT green building certification.

41. **National Environmental (Amendment) Act 47 of 1980 and its amendments:** This is the law that incorporates and covers all aspects of the environment in Sri Lanka. The National Environmental Act (NEA) No. 47 of 1980 is the basic national decree for protection and management of the environment. The NEA has gone through several amendments in the past in a bid to continually improve and to respond to the challenging conditions. There are two main regulatory provisions under the NEA which is implemented by the Central Environmental Authority (CEA).

42. The Environmental Impact Assessment (EIA) procedure for major development projects has been published in 1993 and is available with the CEA. The EIA process is implemented through designated Project Approving Agencies (PAAs). The screening, scoping, formulation of initial environmental examination (IEE), environmental management plan (EMP) and procedures for IEE and EMP disclosure and public comments will be governed by NEA of 1980 and its subsequent amendments of 1988 and 2000, and by environmental regulations. Under the national regulations, the current development project of the FT does not require an IEE because it is not within a designated protected area.

43. The Environmental Protection License (EPL) is a procedure for the control of pollution. Regulations pertaining to this process have been published in 1990 and are available with the CEA EPL is issued on the regulations are gazette under Gazette Extraordinary No. 1533/16 dated January 25, 2008, for a variety of sectors involving in manufacturing, construction and services. For the operation of the canteen the FT will be required to obtain an EPL. Under local legislation, an IEE is not required as the development is categorized in the “un - prescribed projects. However, CEAs consent for the projects under non-prescribed category has not been obtained; the process would have to be initiated for an EPL. The statutory clearance required by the subproject are briefly listed in Table 04.

Table 4: Statutory Clearances Required for the Project

Type of Clearance	Activity	Authority	Timeframe
Environment Clearance Environmental	Implementation of the project and waste water	CEA	Before construction

Protection Licensing) Regulation No. 1533/16of 2008	treatment guidelines.		
Obtain recommendations from the Meteorology Department	Obtain information from the Meteorology Department on wind resistance to the building. Carry out a wind vulnerability assessment with master plan	Meteorology Department	Before construction
Clearance for landslide vulnerability	Obtain clearance and recommendations.	NBRO	Before construction
Clearance for development activities Green building certificate (Annex 06)	Implementation of the project and construction of the building. They will direct to relevant authorities.	UDA	Before construction
Local Authorities building approval	The Pradeshya Saba, Impulpe share the powers regarding the approval of buildings plans, control of solid waste disposal, sewerage and other public utilities. Adhere to building regulation	Local Authority (Imbulpe Pradeshiya Saba)	Before construction
Approval for removal of trees on site	Site clearance to have space for the building and to provide access and material storage.	DS	Before construction
Consent from relevant government agencies	Construction of building and culverts and other drainage systems etc.	RDA, CEA	Before construction
Water Supply	Supply of potable water for the facility and supply during the construction	NWSDB	After completion of the building

Source: Compiled by TMS.

44. Apart from the clearances for the overall project work, the contractor, before starting the construction work, has to obtain required Clearances listed in Table 05. for operating his equipment and carrying out construction work.

Table 5: Clearance required to be obtained by the Contractor

No	Construction Activity & Type of Clearance Required	Statutory Authority	Statute Under which Clearance is Required
1	Consent for establishment of Stone Crushers and Cement Mixing Batching Plant	CEA	National Environmental Act No. 47 of 1980

2	Permission for withdrawal of groundwater for construction	NWRB/	National Water Supply & Drainage Board Law, No. 2 of 1974
3	Removal of tree and site Clarence	Divisional Secretary, CEA	Forest cover removal more than 6 acres.
4	Permission for extraction of sand, metal from soil	Geological Survey and Mines Bureau (GSMB)	Geological Survey and Mines Bureau (GSMB) Act No. 33 of 1992
5	Location and layout of workers camp, & equipment and storage yards	Imbulpe Pradeshiya Saba	Local Government Ordinances and Acts – Urban Council Ordinance 61 of 1939, Act 29of 1947, Act 18 of 1979, and Act 13 of 1979
6	Discharges from labour camp	Central Environmental Authority (CEA)	National Environmental Act Act No. 47 of 1980 National Environmental (Protection & Quality) Regulations, No. 01 of 1990
7	Disposal of solid and liquid waste	Central Environmental Authority (CEA), Imbulpe Predeshiya Saba.	National Environmental Act No. 47 of 1980
8	Noise and dust pollution during construction activities	CEA	Air (Prevention and Control of Pollution) Act, 1981 National Environmental (Noise Control) Regulations No. 01 of 1996
9	Disposal of spoil material garneted during building and construction and demolition of already existing building	Imbulpe Pradeshiya Saba CEA	National Environmental Act Act No. 47 of 1980
10	Revenue license for the heavy machinery and other vehicles at the work site	Office of provincial Commissioner for Motor Traffic the vehicle is being registered	Motor traffic Statute of Western Province No 7 of 1991.
11	Engagement of Labour - Labour License	Labour Commissioner	Shop and office Employees Act 1934 Employees' Trust Fund Act No 15 of 1980 established the

			Employees' Trust Fund (ETF). Employees' Provident Fund Act of 1958 Municipal Council Ordinances and Acts – Urban Council Ordinance 61 of 1939, Act 29 of 1947, Act 18 of 1979,
	Engagement of Labour- • Social Security- • Labour Welfare- • Wages	Labour Commissioner (Ministry of Labour and Employment	The Employees' Provident Fund Act, 1958 & Miscellaneous Provisions 1975 Workmen's Compensation Ordinance of 1935 and subsequent Amendments hop and Office Employees (Regulation of Employment and Remuneration) Act, 1954 Factories Ordinance, 1942 2010 on fair treatment

45. **Construction and Demolition Waste**: When obtaining permission for building construction, a plan should be made available as to how to dispose the waste that is generated on site. Every waste generator shall be responsible for collection, segregation of concrete, soil and others and storage of construction and demolition waste generated separately; deposit at collection center so made by the local authority. LA shall be responsible for proper management of construction and demolition waste within its jurisdiction including placing appropriate containers for collection of waste, removal at regular intervals, transportation to appropriate sites for processing and disposal Table 06 Timeframe for Planning & Implementation.

Table 6: Timeframe for Planning & Implementation

Sl. No	**Compliance Criteria**	**Duration**
1	Identification of site for collection and processing facility	3 month
2	Commissioning and implementation	5 month
3	Monitoring by SPCBs	3 times a year

46. Present feasibility and cost for equipment and building of the FT at SUSL is not completed at the time of this report preparation. Bidding document will be prepared for FT in September 2018 and technical bids will be evaluated.

B. Administrative Framework

47. **Central Environmental Authority**: The CEA basically designs the scheme, procedures and standards to control the water, air & noise pollution, land degradation and hazardous substances and waste management. CEA advise the MOMDE on matters concerning prevention, control and abatement of water and air pollution; coordinate the activities of CEA and provide technical and research assistance; prepare manual, codes, guidelines & standards etc. SUSL will be required to obtain an environmental recommendation letter or EPL from CEA. The NEA regulations stipulate that canteen facilities with capacity of over 50 will require an EPL. This will fall under EPL category B.

48. According to the BIQ, the proposed project falls in to the un-prescribed category. According to the BIQ and IEE/EIA Environmental Guidelines of CEA, the proposed project falls in to the non-prescribed category. Therefore, environmental clearance for an IEE will not be required from government of Sri Lanka. CEA consent for the FT development project under non-prescribed category has to be obtained through a letter. Annex 07- provides completed BIQ with some gaps for submission to CEA for environment clearance).

49. **NBRO:** During all stages, consult NBRO on establishing buffer zone to protect the area from possible land slide risk. Carry out revision on the geotechnical report once the detailed plan is available to evaluate the load transferred to the bed rock etc.

50. **Ibulpe Pradeshiysa Saba**: The local authority will be incharge of soild waste disposal until the CEA Pilisaru waste management project is implemented. Impulpe Pradeshya Saba has been declared as an sixth order urban center and is govern by the Pradeshiya Saba Act No. 15 of 1987.

C. International Agreements

51. Sri Lanka is signatory to numerous environmental conventions. The applicable international agreements are provided below.

- Conventions on Wetlands of International Importance especially as waterfowl habitats / Ramsar (entered into force in Sri Lanka in 1990)
- Convention on International Trade in Endangered Species of Wild Fauna & Flora/ CITES (entry into force in Sri Lanka in 1979).
- Convention on the conservation of Migratory Species of Wild Animals/ CMS (1990).
- United Nations Framework Convention on Climate Change/ UNFCCC (Sri Lanka ratified it in November 1993
- UN Convention on Biological Diversity / CBD (Sri Lanka ratified in 1994).
- Plant Protection Agreement for Asia and the Pacific region (Sri Lanka ratified in 1994).
- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Sri Lanka ratified in 1992).

D. ADB Safeguard Policy Statement, 2009

52. The Asian Development Bank has defined its Safeguard requirements under its 'Safeguard Policy Statement 2009 (SPS 2009). It has three operational policies on the environment, indigenous people, and involuntary resettlement. These three policies involve a structured process of impact assessment, planning, and mitigation to address the adverse

effects of the subprojects throughout its cycle. The safeguard policies require that (i) impacts are identified and assessed early in the project cycle; (ii) plans to avoid, minimize, mitigate, or compensate for the potential adverse impacts are developed and implemented; and (iii) affected people are informed and consulted during project preparation and implementation. The policies apply to all ADB-financed projects.

53. The Environment Safeguards Policy ensures environmental soundness and sustainability of projects and supports the integration of environmental considerations into the decision-making process. The subprojects under the project are screened according to type, location, scale, and sensitivity and the magnitude of their potential environmental impacts, including direct, indirect, induced, and cumulative impacts.

54. ADB's SPS 2009 classify a project depending on following four categories.

- Category A: A proposed project is classified as category A if it is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works. An Environmental Impact Assessment is required.
- Category B: A proposed project is classified as category B if its potential adverse environmental impacts are less adverse than those of category A projects. These impacts are site-specific, none or very few of them are irreversible, and in most cases mitigation measures can be designed more readily than for category A projects. An Initial Environmental Examination is required.
- Category C: A proposed project is classified as category C if it is likely to have minimal or no adverse environmental impacts. No environmental assessment is required although environmental implications need to be reviewed.
- Category FI. A proposed project involves the investment of ADB funds to or through a financial intermediary. The financial intermediary must apply and maintain an environmental and social management system, unless all of the financial intermediary's business activities have minimal or no environmental impacts or risks.

55. **Policy Principles**: Ensures that the screening process is used for proposed project, as early as possible, to determine the appropriate extent and type of environmental assessment so that appropriate studies are undertaken and potential impacts and risks assessed. There are 11 guiding Policy Principals for environmental safeguards to ensure environmental soundness and sustainability of projects and to support the integration of environmental considerations into the project decision-making process. Environmental safeguards are triggered if the subproject is likely to have potential environmental risks. Their relevance to the subproject is discussed in Table 07.

Table 7: SPS Policy Principle

	Policy Principles	Met	Comments
1	Use a screening process for each proposed project, as early as possible, to determine the appropriate extent and type of environmental assessment so that appropriate studies are undertaken	✓	All screening for environmental, IR, IP carried out

	commensurate with the significance of Potential impacts and risks.		
2	Conduct an environmental assessment for each proposed project to identify potential direct, indirect, cumulative, and induced impacts and risks to physical, biological, socioeconomic (including impacts on livelihood through environmental media, health and safety, vulnerable groups, and gender issues), and physical cultural resources in the context of the project's area of influence. Assess potential trans boundary and global impacts, including climate Change. Use strategic environmental assessment where appropriate	✓	
3	Examine alternatives to the project's location, design, technology, and components and their potential environmental and social impacts and document the rationale for selecting the particular alternative proposed. Also consider the no project alternative.	✓	Location alternative was not considered.
4	Avoid, and where avoidance is not possible, minimize, mitigate, and/or offset adverse impacts and enhance positive impacts by means of environmental planning and management. Prepare an environmental management plan (EMP) that includes the proposed mitigation measures, environmental monitoring and reporting requirements, related institutional or organizational arrangements, capacity development and training measures, implementation schedule, cost estimates, and performance indicators. Key considerations for EMP preparation include mitigation of potential adverse impacts to the level of no significant harm to third parties, and the polluter pays principle.	✓	EMP prepared
5	Carry out meaningful consultation with affected people and facilitate their	✓	Stakeholder consultations were

	informed participation. Ensure women's participation in consultation. Involve stakeholders, including affected people and concerned nongovernment organizations, early in the project preparation process and ensure that their views and concerns are made known to and understood by decision makers and taken into account. Continue consultations with stakeholders throughout project implementation as necessary to address issues related to environmental assessment. Establish a grievance redress mechanism to receive and facilitate resolution of the affected people's concerns and grievances regarding the project's environmental performance.		carried out on 1st May 2018 and was attended by 23 people with no female representation. EMP recommends continuous stakeholder consultations with an emphasis on female's attendance.
6	Disclose a draft environmental assessment (including the EMP) in a timely manner, before project appraisal, in an accessible place and in a form and language(s) understandable to affected people and other stakeholders. Disclose the final environmental assessment, and its updates if any, to affected people and other stakeholders.	✓	Done
7	Implement the EMP and monitor its effectiveness. Document monitoring results, including the development and implementation of corrective actions, and disclose monitoring reports	X	EMP prepared for implementation but lacking in house capacity for implementation.
8	Do not implement project activities in areas of critical habitats, unless (i) there are no measurable adverse impacts on the critical habitat that could impair its ability to function, (ii) there is no reduction in the population of any recognized endangered or critically endangered species, and (iii) any lesser impacts are mitigated. If a project is located within a legally protected area, implement additional programs to promote and enhance the conservation aims of the protected area. In an area of natural habitats, there must be no significant conversion or degradation, unless (i)	X	Biodiversity assessment as it is a forested patch in ecologically important region. However, location itself is not within a protected area. .

	alternatives are not available, (ii) the overall benefits from the project substantially outweigh the environmental costs, and (iii) any conversion or degradation is appropriately mitigated. Use a precautionary approach to the use, development, and management of renewable natural resources.		
9	Apply pollution prevention and control technologies and practices consistent with international good practices as reflected in internationally recognized standards such as the World Bank Group's Environmental, Health and Safety Guidelines. Adopt cleaner production processes and good energy efficiency practices. Avoid pollution, or, when avoidance is not possible, minimize or control the intensity or load of pollutant emissions and discharges, including direct and indirect greenhouse gases emissions, waste generation, and release of hazardous materials from their production, transportation, handling, and storage. Avoid the use of hazardous materials subject to international bans or phase outs. Purchase, use, and manage pesticides based on integrated pest management approaches and reduce reliance on synthetic chemical pesticides.	X	National standards for air, noise and sewage discharge are below the IFC-WB EHS standards. Therefore, IEE recommend the adoption of more stringent standards.
10	Provide workers with safe and healthy working conditions and prevent accidents, injuries, and disease. Establish preventive and emergency preparedness and response measures to avoid, and where avoidance is not possible, to minimize, adverse impacts and risks to the health and safety of local communities	✓	IEE has in cooperated these conditions.
11	Conserve physical cultural resources and avoid destroying or damaging them by using field-based surveys that employ qualified and experienced experts during environmental assessment. Provide for the use of "chance find" procedures that include	✓	This land is not in an archaeologically sensitive area therefore chance find procedures do not apply under the local context. However, EMP will include a note

	a pre-approved management and conservation approach for materials that may be discovered during project implementation.		that in event of a chance find, all work at the site will be stopped and the Department of Archaeology be informed.

56. There are 12 IR Safeguard Policy Principles to avoid involuntary resettlement wherever possible; to minimize involuntary resettlement by exploring sub project and design alternatives; to enhance, or at least restore, the livelihoods of all displaced persons in real terms relative to pre-project levels; and to improve the standards of living of the displaced poor and other vulnerable groups. IR safeguards are triggered under physical displacement (relocation, loss of residential land, or loss of shelter) and economic displacement (loss of land, assets, access to assets, income sources, or means of livelihoods) as a result of (i) involuntary acquisition of land, or (ii) involuntary restrictions onland use or on access to legally designated parks and protected areas. It covers them whether such losses and involuntary restrictions are full or partial, permanent or temporary. The subproject was classified as Category C for IR safeguards.

57. IP Safeguards have 9 guiding Policy Principals to design and implement projects in a way that fosters full respect for Indigenous Peoples' identity, dignity human rights, livelihood systems, and cultural uniqueness as defined by the Indigenous Peoples. IP safeguards do not get triggered under this subproject or the overall project.

58. **Conclusion**: The proposed subproject environmental impacts are not adverse in nature and few of them are reversible and mitigation measures can be designed more readily for the identified impacts. As per the ADB's Safeguard Policy Statement the proposed FT subproject of SUSL was classified as Category 'B' for environment requiring an IEE. In order to meet Environmental Policy Principles 7, 8, and 9, additional activities and mitigations have been were identified where necessary. All other Policy Principles have been met.

IV. DESCRIPTION OF THE ENVIRONMENT

A. Methodology used for Baseline Study

59. Data for this study has been primarily collected through comprehensive literature survey, discussion with stakeholder agencies, and field visits to the proposed subproject site. The literature survey broadly covered the following:

- Subproject details, reports, maps, and other documents prepared by technical experts of the ADB PPTA team and discussions with technical experts of the PIU of SUSL team, relevant government agencies like CEA, NBRO, Imbulpe Divisional Secretariat, NWSDB, MOH office Imbulpe and Imbupe Pradeshya Saba etc.
- Secondary data from previous project reports and published articles, and literature on land use, soil, geology, hydrology, climate, socioeconomic profiles, and other planning documents collected from government agencies (including the resource profile for the area) and websites.
- A rapid biodiversity assessment was done at the selected site as it is situated in a high diversity area of the country.
- During the site visit, the REA, IP and IR checklists were filled, and the findings incorporated in the IEE. In addition, activities such as assessment of the existing

location and the surrounding environment identification of sensitive areas, key informant interviews were carried out.

B. Location Area and Connectivity

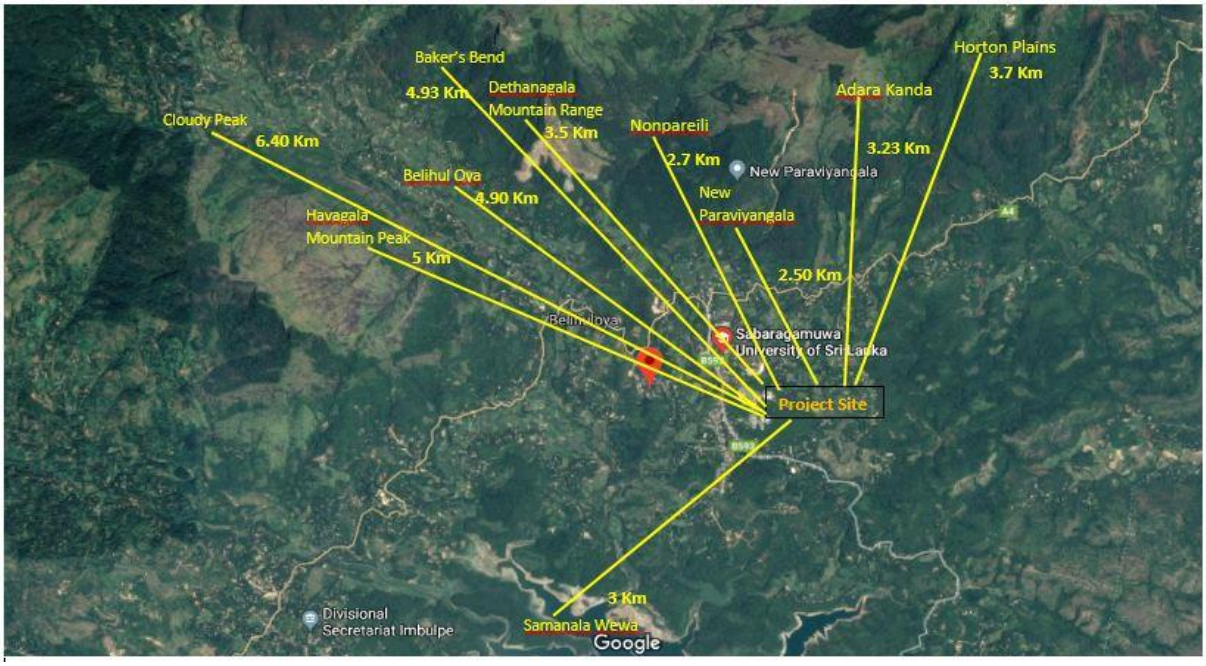
60. B 593 -Pambahinna-Kumbalgama-Rajawaka-Kapugala Rd connects SUSL to the main road -the Colombo Batticaloa A4 highway. Pambahinna-Kumbalgama-Rajawaka-Kapugala Rd also connects SUSL to the Samanala Wewa dam and the power station. The A4 road cuts across Belihuloya - Pambahinna area to destinations like Beragala, Haputale, Badulla, Nuwara Eliva. SUSL is 1.5 km from Belihul Oya town. It is 5.5km to the Imbulpe DS Office, 5.8km to Imbulpe sub post office, 2.5km to the Belihul Oya post office and 1.33km to the People's Bank.

61. Idalgasmulla railway station is 13 km from the subproject site. The subproject is 1km from the Pambahinna junction.

C. Area of influence

62. Imbulpe Division is one of the key residential areas located 6.5 km from the Balangoda town. The subproject site is 3.3km to Sri Lanka Samanala Wewa Metro Electric Power Project, 892m to the Buddhist Temple of Sabaragamuwa University of Sri Lanka, 1km to the Bodhi Rukkarama temple and 1.5km to the Karagasthalawa Sri Syila Gangarama rajamaha Viharaya. And 5.5km to Hindu temple (Aluth Nuwara Katharagama Dewalaya). See Figure 6 for the area of influence.

Figure 6: Map Show the Location of the Project and the Surrounding



Source: Prepared by TMS.

D. Land Use

63. Before development occurred in the area, Imbulpe was composed of forest cover. The land use pattern in the project area today, is residential with predominately mixed development. Project surrounding land (Muththetuwegama GND) can be categorized into residential and commercial area (6%), vegetation cover (52%) and streams (3%) plantation (39%). Proposed site is a forest patch. Majority of the vegetation cover in the Muththetuwegama GN division is composed of grass land (79.57%), forest (32.69%) followed by paddy fields. The high percentage of forest cover promotes recreation such as trekking, camping, bird watching, biological studies etc. The total land use coverage in Imbulpe is 23,140 ha. Table 8 highlights the land use patterns in the Muththettuwegama GND.

Table 8: Land use Pattern Observed in the Muththettuwegama GND

Land use Muththettuwegama GND		
Land Use	**Hectares**	**Percentage (%)**
Forest	270.34	32.69
Grasslands	658	79.57
Scrub	403.84	48.83
Garden	55.54	6.71
Paddy	153.86	18.6
Tea	68.21	8.24
Chena	62.2	7.52
Rubber	4.48	0.54
Other plantation	33.16	4
Stream	25.8	3.12

Source: Resource Profile.

E. Geology, Soil and Topography

64. The Imbulpe Divisional Secretariat is geologically composed of gravel (Quiet Sight, Granite Niaz, Janokayit, Marble and Unclassified highlands)[4]. The Layers in the sub surface identified as the thickness of the different layers at the borehole locations in FT. Proposed FT building is located on the small ridge with a slope varying from 10 – 25 degrees. During the time of investigation, the proposed land was fully occupied by vegetation[5]. According to the bore hole investigation, it consists of sandy materials upto the level of completely weathered rock which extend to a depth of around 0.00-7.70m from the existing ground level. The completely weathered rock layer extends up to the borehole termination level at the depth of about 28m which can be considered as a residual formation which would have been formed by in-situ. Water was not encountered in the borehole investigation (refer Annex 08 for soil report).

[4] Resource profile
[5] June 2018 Soil investigation report for the proposed building for faculty of technology phase I

65. The bearing capacity given in the report is only for the area covered with the two bore holes. If the building is place on cut and filled ground, differential settlements should be taken in account of foundation recommendation. The stability of the ground with building load cannot be assessed due to the unviability of design details of proposed building. Though the numerical figures suggest that the slope is safe and can with stand by its own, some failures could be expected there during a period of an excessive prolonged rainfall.[4]

F. Seismicity

66. The project is located in the Sabaragamuwa province of Sri Lanka which is within active seismic region. However, upon general inquiry from NBRO, SUSL site location is not a high risk zone, however, it was recommended that clearance be obtained from the Balangoda regional NBRO office. The stability of the bedrock and peat soil should be considered during building design.

G. Climate and Meteorology

67. The area lies within the intermediate zone and a narrow band lies between the wet and dry zones with parameters of rainfall, temperature and winds that are well suited for outdoor recreational activities. Imbulpe division lies within the moist semi-evergreen forest belonging to the Eastern Intermediate Zone of Sri Lanka. It experiences heavy rain to the south west to the low land wind ward slopes of the central high lands from South-West Monsoon from May to September, mean rainfall in project area is 83mm and optimum rainfall is 303mm. Minimum rainfall is 1400 mm per year and a maximum of over 2000 mm per year. June, July and August are considered dry with rainfall averaging 96 mm per month[6].

68. **Temperatur**e: The average annual temperature is 26^0C, with a low of 18^0C during the months of December and January. The hottest months in Belihul Oya are May, June, and July. [7] .

69. **Humidity** Low humidity and a non-polluted atmosphere with well tolerated temperature levels is common to this area. The most humid months in Belihul Oya are in July (56.6% relative humidity), and December (82.1%)[8].

70. **Wind speed and direction:** An average wind speed of 31 km/h has been recorded during the months of June to September. At times winds may appear somewhat gusty in the area. The wind blows in from the north west of the study area [9]. The windiest month is July, followed by June and August. July's average wind speed is around 6.3 knots (7.2 MPH or 11.6 KPH). Maximum sustained winds (the highest speed for the day lasting more than a few moments) were recorded in mid July where average top sustained speeds reached 11.3 knots.[10]. In 2016 Halpe, Belihuloya, 12 houses were damaged, injuring several children.[11]

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[6] K.V.D. Edirisooriya Manike Masters thesis on Recreational potential of Belhu oya Pabahinna area 2000.
[7] https://championtraveler.com/dates
[8] ibid
[9] K.V.D. Edirisooriya Manike Masters thesis on Recreational potential of Belhu oya Pabahinna area 2000
[10] https://championtraveler.com/dates
[11] One man killed, houses damaged in strong winds Sunday times Sunday, July 13, 2014

H. Ambient Air Quality

71. To draw up a baseline status of the ambient air quality, SUSL will take the measurements prior to the commencement of the subproject. To assess the baseline value for the background noise level, ambient noise monitoring will be conducted by the SUSL prior to the construction activities at the site.

I. Drainage and the River Systems:

72. The subproject is located in the Walwe basin and 3.3 km off from Samanala Wewa reservoir. The water supply intake point for the university is located upstream of Hirikatu Oya (Figure 7 show the surroundings of the stream) which is less than 1km from SUSL. Subproject is located in the upper reaches of the Udawalawe tank cascade system (Figure 8 shows drainage map and Figure 9 provides area map).

Figure 7: Hirikattu Oya

Figure 8: Drainage Map of Proposed Site

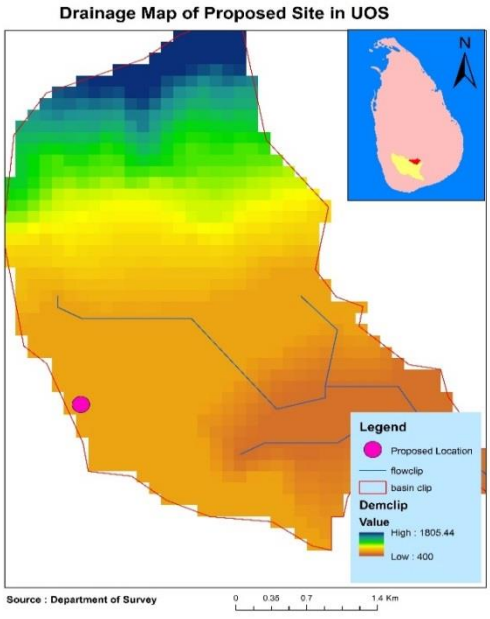
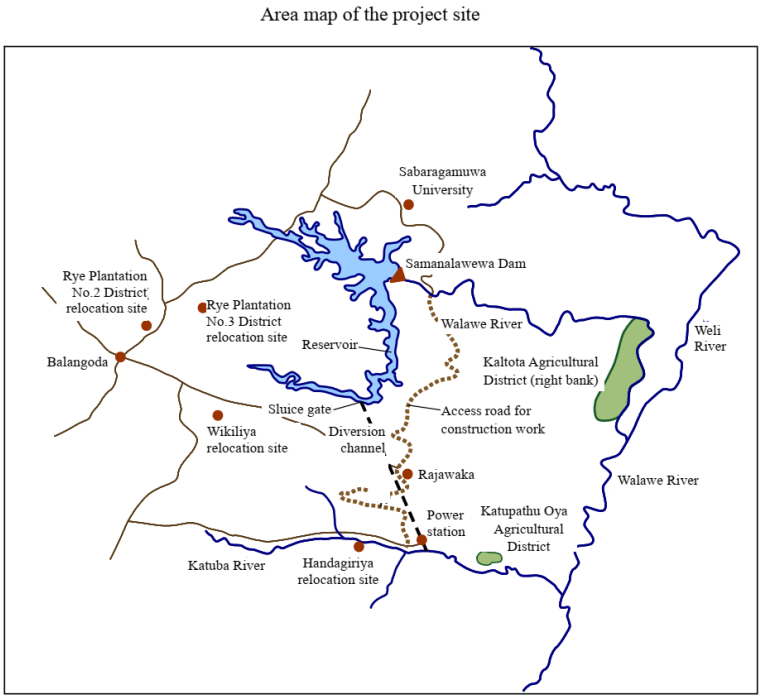


Figure 9: Area Map of Project Site

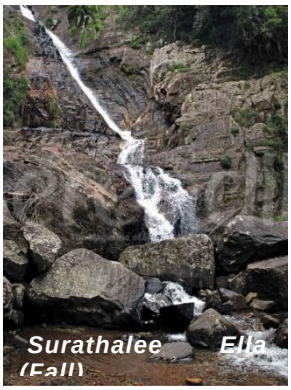


Source: Prepared by TMS.

J. Surface and Ground Water Quality

73. The Belihuloya - Pambahinna area has fresh water resources in the form of waterfalls, reservoirs, rivers and streams[12]. ***Belihuloya has an abundance of waterfalls including the the Bambarakanda Ella which is the highest in the country.*** Other waterfalls in the area include the Pahanthuda Fall shaped like an oil lamp and about 1.5km from Belihuloya and the Brampton Fall, 10km from Belihuloya.

Figure 10: Common surface waters in the region



[12] K.V.D. Edirisooriya Manike Masters thesis on Recreational potential of Belhu oya Pabahinna area 2000.

74. Water supply in the region has been an issue. Even though SUSL had been using the Water Purification Plant with the capacity for providing the daily needs of water for 1,500 persons constructed in the year 1986 under the Samanala Wewa project, it has been inactive since 2015. Since then, the water from Hirikatu Oya has been obtained direct to the tank and distributed by mixing with chlorine. Reports of the monthly tests carried out by the institution showed presence of bacteria in the water and the water did not conform to the required potable water quality. By May 2017, construction of the tube well remained partly constructed.[13]

75. Recently, however, with the Water Supply and Sanitation Improvement Project (WASSIP) at Pabahinna at cost of Rs. 1020 million under World Bank funding is expected to supply water to the region including SUSL. The project which was initiated in 2017 and completion dates are scheduled for 2019. This will have to be closely followed up.

K. Ecology and Biodiversity

1. Rapid Biodiversity Assessment

76. The proposed subproject area falls within the Intermediate Zone. Floristically it is classified under the "Eastern intermediate lowlands" floristic zone or Moist Mixed Evergreen Forest[14]. Tropical moist semi evergreen forests and savannah forests are the typical vegetation formations present in this zone. The main habitats observed within the proposed subproject site is a low canopy sparse vegetation dominated with "Spicate Eugenia" (Syzygium zeylanicum) and with some other shrubs, herbs, orchids and ferns. Further, the surrounding area is also consist with the same vegetation type Further, the subproject is located in a region that is ecologically importance due to its location in a bio geographical transition between the wet zone to the west and the dry, being located in a thin strip of the intermediate zone. The subproject site is also located on the second peneplain of the country between the World's End escarpment to the north ascending to the Horton Plains in the third (highest) peneplain, and the Handagiriya-Kalthota escarpment to the south descending to the first peneplain of the lowland coastal zone. Due to these bio geographical setting surrounded by physical and climatic barriers, the larger landscape in which the subproject site it situated carries a high biodiversity with a relatively high element of endemicity. [15] The distances to the important conservation areas in the region are provided in Table 09.

Table 9: Distance from Subproject to Important Conservation Areas

Description	Dist. between center line of the project and boundary wall of the monument	Protection Status
Samanalawewa reservoir	3 Km	Protected by Sri Lankan State under Ceylon Electricity Board
Adara Kanda	3 Km	Protected by Sri Lankan Forest Department
Horton plains	3.7 Km	Protected by Department of

[13] Auditor Generals report that was submitted to the parliament of Sri Lanka Sabaragamuwa University of Sri Lanka (refer annex 14)

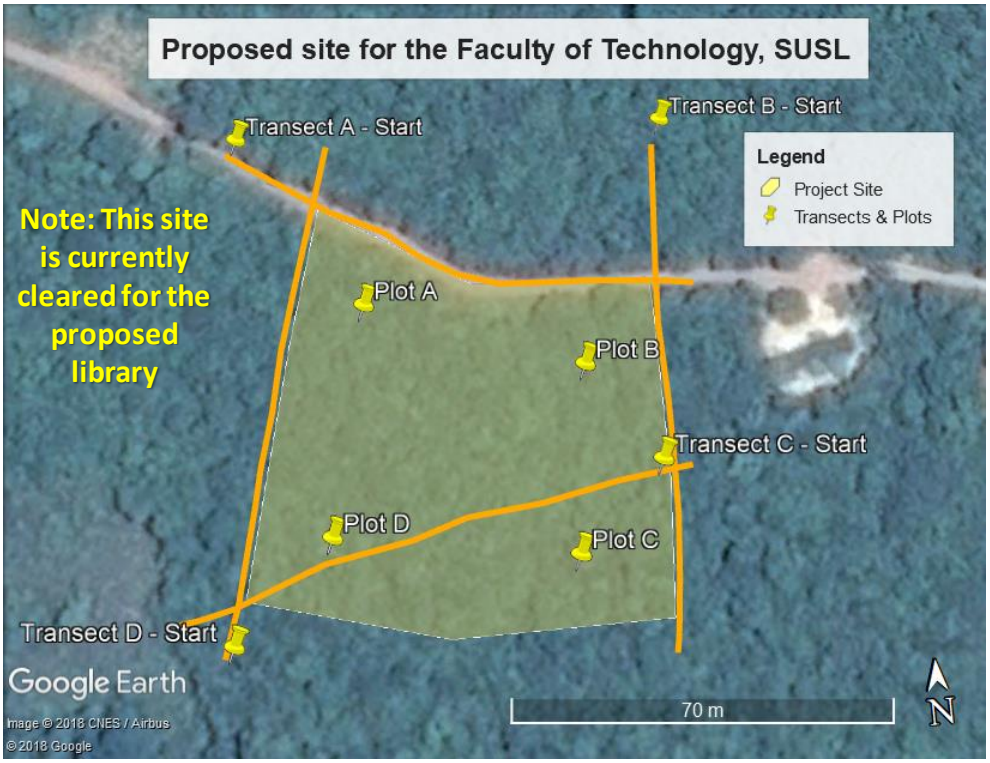
[14] Ashton, Mark S, Savitri Gunatilleke, Neela De Zoysa, MD Dassanayake, Nimal Gunatilleke, and Siril Wijesundera. 1997. A field guide to the common trees and shrubs of Sri Lanka: WHT Publications Colombo, Sri Lanka

[15] Rapid Biodiversity Assessment Report of the Proposed Site for the Technology Faculty of Sabaragamuwa University of Sri Lanka, 2018. Sabaragamuwa University of Sri Lanka, Belihul Oya.

		Wildlife conservation
Hirikatu oya Upper stream	950 m	Protected by Sri Lankan Forest Department
Dethanagala mountain range	3.5 Km	Protected by Sri Lankan Forest Department
Paraviyangala mountain	2.5 Km	Protected by Sri Lankan Forest Department

77. As a result, a rapid bio diversity assessment (RBA) was carried out in May, 2018 to assess whether there were any threatened or endemic species within the project area (Figure 11 shows the sampling points).

Figure 11: Location of the Subproject Area with the Sample Points



2. Summary of Findings

78. This section provides a summary of the RBA findings. The full report is provided in Annex 09. Fauna: The study reported 144 species including 98 vertebrate species representing 50 families and 46 species. 17 endemic species where recorded, while none of them are restricted-range species within the study area.

79. **Flora:** Typical savannah vegetation does not exist in the subproject site as most of the vegetation was highly modified due to climax vegetation. The Shannon wiener species diversity index for plant species (>10 dbh) was -1.08 and the Simpson's Index was 0.25 for the total survey area. The total number of the spontaneously occurring vascular plant species, which have been noted within the survey site represents 55 % of *Syzygium zeylanicum* and the rest were represented by *Acronychia pedunculata, Cinnamomum citriodorum, Pagiantha dichotoma*, and *Symplocos cochinchinensis*. Many of them were considered as Least Concern species

according to the National Red List 2012. Of the above, only *Cinnamomum citriodorum* was endemic and identified as vulnerable.

80. Of the flowering plants and lower plants, *Gyrinops walla* which is a native species is categorized as vulnerable. There were 2 other endemic species recorded, *Osbeckia octandra* and *Gaernera wakeri* of which the latter has been classified as near threatened. Few orchids were common to the studied area including Dendrobium aphyllum, and Polystachya concreta. The scanty ground layer consisted of some fern species such as *Schizia digitata* (near threatened), and *Lindsaea repens* (identified as critically endangered) etc. Further single epiphytic fern, *Drynaria quercifolia,* was present.

81. Considering the Medicinal values of these floral species, the tree Symplocos cochinchinensis (Bombu), and herb Clidemia hirta (Kata kalu bovitiya) has considerably high medicinal value when compared with the other recorded species. Many of the other higher plants and some of the herbs reported during the survey also have traditional medicinal values. However, there is no evidence that have been using such plant species for their medicinal requirements form the sub project location.

82. **Fauna:** The RBA shows a moderately high faunal species richness in the subproject location including an above average percentage of endemic species (11), but with a lower percentage of threatened species (3). The endemic and threatened species are recorded from less mobile taxa such as the land snails. According to the Shannon-Weiner Index, moderate to high diversity is shown for land snails and butterflies and also high diversity is observed for birds.

83. The study reported 143 species, including 97 species of vertebrates, representing 50 families and 46 species from the selected invertebrate taxa representing 11 families. These species were recorded to inhabit the moist-semi-evergreen forest patch in the subproject area and its periphery, as well as those disturbed/developed areas outside the immediate periphery. This includes 18 endemic species, while none of them are restricted-range species. 4 species were only identified to genus level as they were considered “data deficient”.

84. Of all the species recorded, 11 species fall within the nationally threatened category. They are provided in the Table 10. These species include 4 land snail, 2 butterfly, 2 bird and 3 mammal species.

Table 10: Nationally Threatened Fauna Found at Subproject Location (National Red List)

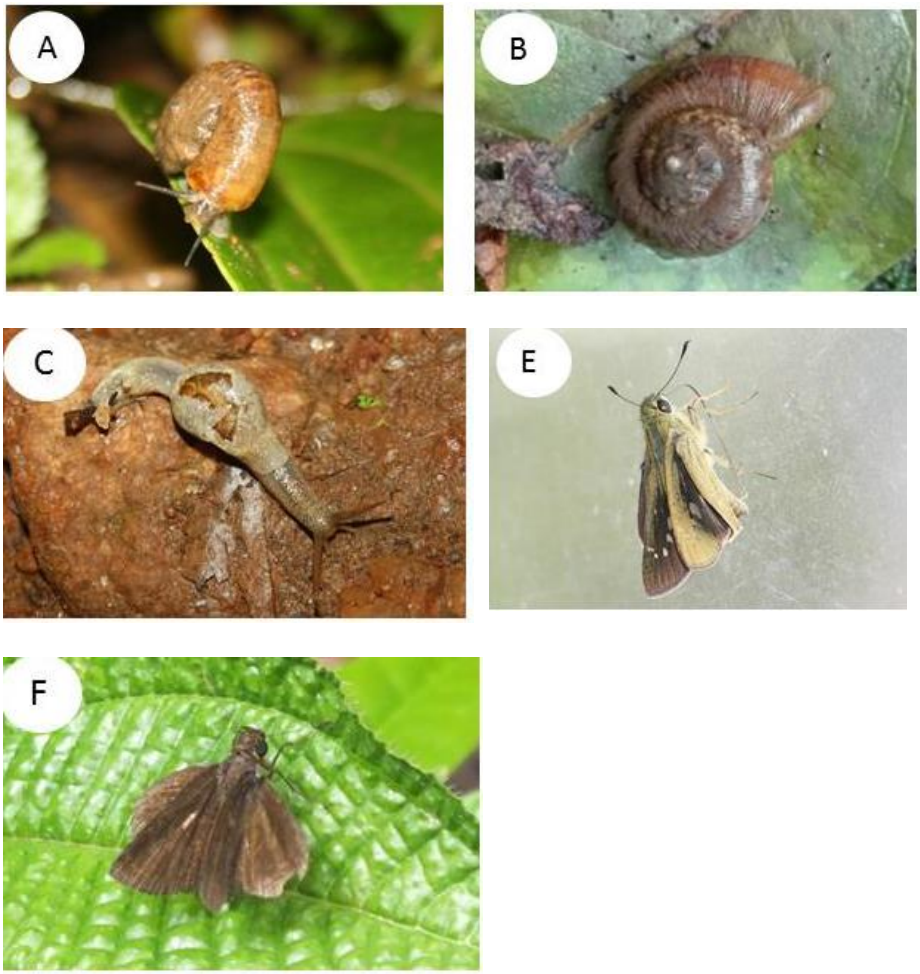
Family	Species	Common name	Conservation status
Ariophantidae	*Ratnadvipia irradians*	Sri Lanka Ratnadeepa Snail	Vulnerable
Camaenidae	*Beddomea trifasciatus*	Three-banded Beddomea Snail	Vulnerable
Cyclophoroidea	*Aulopoma itieri*	Itier’s Operculate Snail	Endangered
Cyclophoroidea	*Aulopoma sphaeroidium*	Sphaeroid’s Operculate Snail	Endangered
Hesperiidae	*Baracus vittatus*	Sri Lankan Hedge Hopper	Vulnerable
Hesperiidae	*Pelopidas conjuncta*	Conjoined Swift	Vulnerable
Meropidae	*Merops philippinus*	Blue-tailed Bee-eater	Critical
Rallidae	*Rallina eurizonoides*	Slaty-legged Crake	Vulnerable
Felidae	*Prionailurus viverrinus*	Fishing cat Ind	Endangered

Herpestidae VU	*Herpestes vitticollis*	Stripe-necked mongoose	Vulnerable
Vespertillionidae	*Pipistrellus coromandra*	Indian pipistrel	Vulnerable

Data extracted from RBA Report of the Proposed Site for the Technology Faculty of Sabaragamuwa University of Sri Lanka, 2018.

85. The natural forested area beyond the southern end of the subproject site, especially towards the south-east has been identified to harbour several important components of the biodiversity, especially of the animal groups with less dispersal abilities as well as for the shade loving endemic/native plant species and some epiphytic plant species.

Figure 12: Plates of some threatened species fund at subproject site



(A) *Aulopoma itieri* (Itier's Operculate Snail - an endemic and endangered land snail species),
(B) *A. sphaeroidium* (Sphaeroid's Operculate Snail - an endemic and endangered land snail species),
(C) *Ratnadvipia irradians* (Sri Lanka Ratnadeepa Snail - an endemic and vulnerable land snail species),
(E) *Pelopidas conjuncta* (Conjoined Swift -a vulnerable butterfly species),

(F) *Baracus vittatus* (Sri Lankan Hedge Hopper – an endemic and vulnerable butterfly species)

3. Conclusion:

86. The FT development location at SUSL harbors moderate levels of species richness in selected floral and faunal taxa. However, the proportions of endemic and/or threatened species in the project site and its periphery are not considered critical levels. Most of such species even when listed have been recorded from outside the area of direct impact from the project. Therefore, the study supports the argument that the area which is proposed to construct the new building complex of the FT, SUSL currently harbours a natural forest patch with moderate significance on ecological value in terms of floral and faunal diversity.

87. The natural forested area beyond the southern end of the project site, especially towards the south-east identified as the most diverse and area high in endimicity is proposed as a conservation area where the forest patch equal in areas to the forest extent loss due to the project will be maintained. None of the species identified in the subproject area are listed under the global IUCN Red List. The relevant officials related to protected areas are also consulted, and no permit is required.

L. Educational, Medical and Religious Properties

88. Within Imbulpe DSD there were 45 schools, 44 Buddhist dharma schools, 3 Christian Sunday schools, and 4 vocational training centers and one vidatha center. Balangoda base hospital is the main hospital in the area. Other than that, Belihuloya rural hospital, Marathanna estate rural hospital and Pinnawala central dipencery is ear by area. There are 29 doctors, 117 nurses, within the DS. There was one Ayurveda central dispensary within DS. Bodhi Rukkarama temple, Karagasthalawa Sri Syila Gangarama rajamaha Viharaya (1.5km). Hindu Temple (Aluth Nuwara Katharagama Dewalaya 5.5km) are the main important religious places within the DSD.

M. Demographic details of affected population

89. There is a total of 50 GN Divisions within the Imbulpe DS. The total DS population is 66,931 of which 48% is male and 52% is female. Imbulpe is predominantly a Sinhala area having 85% Sinhala, 14.2% Tamil, 22% Muslim, 0.01% other (including Indian Tamil, Burgher, Malay, Baratha, Lanka Chetty). When considering the religious constitution within the DSD, 83% of the population is Buddhist, 13% Hindu, 9% Islam, 2.84% are Christian and 1% is account as other category. There were 17,426 housing units and 826 households who don't have a proper housing unit.

90. **Industry and Economy**: Prehistorically, Imbulpe was famous for the cane, blacksmith industry, pottery and kithul based industry. However, in the modern context, Imbulpe DSD has developed in to a small scale to medium scale and large industries. Within the DSD, there were nearly 3000 people engaged in the industrial sector.

V. ANALYSIS OF ALTERNATIVES

91. Although the proposed FT is located in close proximity to a green cover, impacts associated with construction stage are temporary and short term. Any long-term impacts can be

managed by adhering to the EMP. Also, there is no other location that is more suitable in the vicinity that can be developed as an alternative to the proposed project. Therefore, examination of alternatives to the project‘s location was not done., Design and technology alternatives may have to be considered as required.

92. It can be concluded that “With” project scenario, with positive/beneficial impacts will greatly enhance social & economic development of the region and improve the environment, when compared to the “Without” project scenario, which will further deteriorate the existing environment and quality of life. Hence the “With” project scenario with some reversible impacts is an acceptable option rather than the “Without” project scenario. The implementation of the project therefore will contribute positively to improve the environmental quality in area and the associated surroundings. It will result holistic development of the economy and improve the region and the country. ‘With’ and ‘without’ project scenarios have been compared as shown in Table 11.

Table 11: Project Scenario

With Project		**Without Project**	
Impacts		**Impacts**	
Positive	**Negative**	**Positive**	**Negative**
Provision of facility to train graduates that are geared to job market and economic and best use of the available space	Forest cover reduced	Nil	Unemployed graduates who cannot secure jobs are trained which become a social problem of unrest.
Use of the land that could not be used for agriculture or as residential purpose is being used to improve the regional economy and education.	May contribute to increased landslides. .	Land widely available for wildlife and forest benefit for surrounding community	Nil
University procures modern state of the art facility with equipment	Land preparation and improvement activities increase soil erosion and slide	No impact on the site	No land development and economic development in the region
Improvement in ecology through maintenance of the natural drainage	Increased soil erosion and	Land is left unproductive and band	Increased soil erosion and degradation of the land Increased
Proper solid waste management plan is in place	Increased pollution due to solid waste disposal	Amount of solid waste generated is less	Nil
Regulated disposal of waste water and sludge	I	Amount of waste water generated is less	Unregulated disposal of waste water and sludge
Improved drainage in project site and the surrounding area	Nil	Land no developed and rainwater flows on natural drainage	Nil
Enhanced trade and commerce	Increase of noise during the construction and operational phase	Nil	Micro level trade in the area will be limited
The dust associated with vehicles movement on access earth roads will	Short term increase in dust due to earth work	Nil	Further deterioration of the project access road

also be eliminated			
Increased access to job markets	Nil	Nil	Reduced employment/ economic opportunities There is no additional employment
Employment to local workers during the execution of the project	Outsourcing people from other parts of the country will increase traffic congestion and demand for logistics	Nil	
Better access to other social services such as communication centers, and food cafes	More social networking facilities will create social unrest.	Nil	Nil
Strengthening of local economies and local industries	Nil	Nil	Nil

VI. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

93. The proposed work under FT Development Project will impact on the environment in three distinct phases. During the construction phase which may be regarded as temporary or short-term; the other during the operation stage which will have long term effects. The negative impacts can be reduced or minimized only if proper safeguards are put in place during the design and construction stage itself. These can include reducing pollutant discharge from waste at FT and enhancing the landscape to support the forest system. An effective mitigation strategy will utilize a combination of both options to arrive at practically implementable measures. Efforts will be worked out to minimize any adverse impacts on the various environmental and social components. Where the impacts on various environmental components are unavoidable, mitigation measures will be worked out to minimize the impacts. The mitigation measures recommended during the construction phase should be included in the contract agreement with the contractor and discussed with them to ensure smooth implementation from the beginning.

A. Land and Environment

94. Not much filling is anticipated at the current location however aggregate and sand will be procured from the authorized suppliers and prevalent rules will be followed for borrowing of soil. These will lead to impacts associated with sand mining and quarrying. However, the impact on geology of the region is not considered significant as a result of this subproject. The details of proposed borrow areas investigated with their respective locations would have to be given by the PIU and the site engineer concerned.

95. **Construction Impacts**:

- Alteration of current land use & change in existing profile of the land due to construction activities at proposed subproject location.
- Changes of topography due to indiscriminate quarrying for aggregate.
- River bank erosion due to unregulated sand mining.

96. **Mitigation:** Contractor needs to prepare / follow several mitigation / management plan / guidelines for various construction activities. These guidelines are listed below and detailed out in “Part-III EMP”. They also have to consider the following:

- ICTAD Guidelines for Siting and Layout of Construction Camp Guidelines for Siting. Storage of construction materials should be located sufficiently away from the road frontage. Sand, rubble, metal bitumen and cement should be covered. All cement, bitumen (barrels), oil and other chemicals should be stored and handled on an impervious surface above ground level (e.g. concrete slab) and should be enclosed ensuring that no storm water flows in to the structures. There should be adequate ventilation to avoid accumulation of fumes and offensive odour that could be harmful
- ICTAD Operation and Re-Development of Borrow Areas Guidelines for Siting, Extraction of construction materials should be undertaken only from mines and quarries approved by Geological Survey and Mines Bureau (GSMB). Gravel for the compaction and filling is supplied from government authorized pits. If new material extraction sites need to be located, those should exclude areas which are public and environmentally sensitive. Burrow areas shall not be opened without permission of the site engineer. Environmental requirements and guidelines issued by the CEA, GSMB and LAs should be followed with respect of locating material extraction sites, other operations and rehabilitation of extraction sites at the end of use. Transport, loading and unloading of construction materials should not cause a nuisance to surroundings by way of noise, vibration and dust. All drivers should have valid license for the category of vehicles they drive and follow the speed limits of roads. Construction materials should not exceed the carrying capacity of trucks and the local road.
- .ICTAD Operation and Re-development of Quarrying and Stone Crushing Operations
- ICTAD Guidelines for Siting and Management of Debris Disposal Site
- ICTAD Guidelines for Preparing Comprehensive Waste Management Plan

97. **Operational Impact**:

- In the operation phase, the temporarily modified land use pattern such as temporary construction camps / tents would be dismantled. The FT project, after completion of its construction, would consist of neat landscape pleasing environment.
- Likely change of land use due to site preparation including earth filling of the site and building in the project area.
- Likely change due to construction of the earth drains on the northern and the southern part of the boundary of the project site.

98. **Mitigation Measures:**

- Minimize land use change (clearance of forested are). Clear only the necessary area for development.

B. Water and Environment

1. Drainage and Hydrological Flow

99. **Impacts**:

- Since the project site is near the forest system and no proper storm water drainage systems are in place, there will be a risk of soil erosion during heavy rains with the slope and terrain at the project site.
- During the monsoon period newly, exposed solid subsurface layers without the vegetation cover will be easily subjected to forces of erosion. This may also increase the risk of earth slips unless adequate precaution is taken.
- Poor or non-availability of drainage facilities on the adjoining lands in the university without much green cover is another factor contributing to soil erosion.

100. **Mitigation Measures:** Construction activities will not aggravate soil erosion condition in the area if mitigation measures are followed by the contractor.

- Provide adequate building and roadside drains along property to facilitate its better maintenance. Propose a storm water drainage system around the FT complex to capture monsoonal drain waters during heavy rain and reduce runoff. Permanent and temporary work should be undertaken to control soil erosion
- Detailed drainage plan and soil erosion investigations need to be carried out and accordingly capacity of existing drainage works & cross drainage (CD) structures have to be duly augmented wherever necessary, to accommodate high discharges from the adjoining lands and to avoid possible formation of water pool at the project site. Consult NBRO when adopting these measures.
- Suitable drainage at construction site & camp will be provided to eliminate the chances of formation of stagnant water pools that leads to soil erosion & breeding of mosquitoes
- Top soil generated from construction sites should be stored properly.
- Construction activities including earth work and construction of cross drainages should be conducted during the dry season.
- Temporary earth drains should be provided during the construction activities.
- Design and maintenance of a suitable sewerage system for the FT so that it will not impact the ground water. Avoid construction of sanitation or other facilities that will use and store harmful materials. Geotechnical report recommendations should be considered.

2. Water Use

101. **Construction Impact:** During the construction period water is required for compaction of embankment, dust suppression, concrete mixing and domestic use in the labour camp. Non-availability of appropriate potable water will lead to worker dehydration. If groundwater is to be used, it may lead to over extraction.

102. **Mitigation:**

- The selected Contractor will draw up a water requirement and source plan before the commencement of work. The estimated tentative water requirement can be calculated using the table provided in Annex 10.
- Since there is no dedicated pipe borne water supply at SUSL, the contractor will arrange water required for construction in such a way that the water supply to nearby communities remains unaffected

- Contractor will have to make arrangements for the supply of adequate potable water from a reputed supplier. There should be a storage tank to ensure no scarcity is experienced by the workers.
- If groundwater is to be extracted, NWRB will have to be contacted for approval.

103. **Operation Impact**: Water has been a limiting resource at SUSL, and the current campus has experienced closure as a result of this in the past. Unless a proper water supply system is established there may be similar scarcities in the future. Currently, water is tapped from the upstream area of Hikattu Oya which will not be able to cater for the new development.

104. **Mitigation:**

- Once the detailed designs are in place, carry out an estimate for the FT water requirement.
- If tube-wells are to be bored, prior approval of the NWRB has to be obtained.
- Consult and get a letter of commitment from NWSDB on the World Bank funded WASSIP project. Discussions have been held and SUSL has been promised a water line in 2019.
- Adopt water saving technologies in sanitation. It is important that functional sanitary facilities are maintained with sufficient water in the university to avoid health risks and spread of disease.
- Water storage facilities such as provision of a adequate water storage tanks should be in place so that there will not be any shortage experienced during project implementation.
- Adopt "Ground Water Recharge Pit/ Rainwater Harvesting Structures: Unlined drain in the project may also be connected with the ground water recharge pit to facilitate the recharge of runoff water in to the ground, augmenting the water table of the project area. Ground water recharge pits shall be constructed to facilitate the infiltration of runoff water into the ground. Paved surface of the FT project will reduce the percolation of runoff water and decreases the ground water recharge. Location of proposed ground water recharge pits should be included in the detailed design. These locations should be permanent which shall be handed over to the university maintenance engineering body at the end of the project so that the water shortages can be reduced to a certain extent.
- Apart from provision of the mitigation measures, water quality shall be monitored to understand the effectiveness and further improvement in designs in reducing the concentration of pollutants. The monitoring plan shall be functional in construction as well as in operation stages. Once the detail pans are available monitoring points and the intervals will be decide by the Environmental Officer.

C. Air Environment

105. **Construction Impact:**

- Particulate matter would be the predominant pollutant affecting the air quality during the construction phase as it is likely to generate considerable quantities of dust, especially during dry condition. Dust will be generated mainly during excavation, backfilling, hauling & transportation activities to the site, loading/ unloading, spilling of material during transportation, and open storage of fine

construction materials. This may impact on SUSL community with increased health issues associated with dust.

- Undesirable gaseous pollutants will be generated mostly by the construction machineries. However, suspended dust particles may be coarse and will be settled within a short distance of construction area. Therefore, impact will be temporary and restricted within the closed vicinity of the FT and the access road only.

106. **Mitigation:**

- Wet down and spray water at construction site, quarries if required. Use dust screens especially since subproject location is in close proximity to other functional areas of SUSL.
- Dust emissions during transportation of construction materials should be controlled by enforcing speed limits on the vehicles and ensure transported material is covered with tarpaulin.
- Take steps to avoid dust emissions during loading and unloading of construction material. Tarpaulin covering is mandatory on trucks/lorries which are used for transporting materials
- All filling works are to be protected or covered in a manner to minimize dust generation.
- All vehicles, equipment, and machinery used for construction shall conform to the Sri Lankan government vehicle emission test. For equipment emission norms as specified in air emission gazette under NEA
- The Contractor shall maintain a record of pollution under control for all vehicles and machinery used during the contract period, which shall be produced for verification whenever required
- The air quality monitoring will be conducted as per the plan in chapter 8 and will follow IFC-WB EHS standards. This is in line with the SPS 2009 requirements. Refer Table 12 for air quality standards.

Table 12: Air Quality Standards Comparison

	NEA standards		IFC -WB EHS Guidelines	
	Averaging Period	**Guideline value in mg/m3**	**Averaging Period**	**Guideline value in mg/m3**
Sulfur dioxide (SO2)	24 hrs	80	24hrs	125 (Interim target-1)* 50 (Interim target-2) 20 (guideline
Nitrogen dioxide (NO2)	24hrs	100	1-year 1-hour	40 (guideline) 200 (guideline)
Ozone	8-hour daily Maximum	-	8-hour daily maximum	160 (Interim target-1) 100 (guideline

*Interim targets are provided in recognition of the need for a staged approach to achieving the recommended guidelines.

D. Noise Environment

107. **Construction Impact:**

- During the construction phase, noise will be generated due to movement of operation of light & heavy construction machineries (i.e., dozer, tipper, loader, excavator, grader, scraper, roller, concrete mixer, generator, pump, vibrator,

Drilling machines, crane, compressor etc.) that are known to emit sounds with moderate to high decibel value. Noise generated from sources mentioned above will be intermittent and mostly during daytime.

- Increase in noise level due to construction activities and operation of construction equipment will cause disturbance mainly to the SUSL student and staff community which is the main environmentally sensitive receptor. The other main receptors are the fauna associated with the forested areas.
- The workers are likely to be exposed to high noise levels that may affect them.
- Typical noise level of various activities associated with the subproject is presented below in Table 13 and Table 14 provides typical noise level associated with the operation of construction machinery.
- The construction noise is generally intermittent and depends on the type of operations location and function of the equipment and the equipment usage cycle, it attenuates quickly with increase in distance. However, since the site is fairly rural, sound may appear more.

Table 13: Noise Level of Road Construction Activities

Sl. No.	Construction Activity	Noise Level dB(A)
1.	Grading & Clearing	84
2.	Excavation	89
3.	Foundations	88
4.	Erection	79
5.	Finishing	84

Note: Measured at Leq assuming 70 dB(A) ambient noise level

Table 14: Typical Noise Level of Construction Equipment

Clearing		**Structure Construction**	
Equipment	**Noise Level dB(A)**	**Equipment**	**Noise Level dB(A)**
Bulldozer	80	Crane	75-77
Front end loader	72-84	Welding generator	71-82
Jack hammer	81-98	Concrete mixer	74-88
Crane with ball	75-87	Concrete pump	81-84
Concrete vibrator	76		
Excavation & Earth Moving	Air compressor	74-87	
Bulldozer	80	Pneumatic tools	81-98
Backhoe	72-93	Bulldozer	80
Front end loader	72-84	Cement & dump trucks	83-94
Dump truck	83-94	Front end loader	72-84
Jack hammer	81-98	Dump truck	83-94
Scraper	80-93	Paver	86-88
Grading & Compaction	**Landscaping and Cleanup**		
Grader	80-93	Bulldozer	80
Roller	73-75	Backhoe	72-93
Paving	Truck	83-94	
Paver	86-88	Front end loader	72-84
Truck	83-94	Dump truck	83-94
Tamper	74-77	Paver	86-88

U.S. Environmental Protection Agency, Noise from Construction Equipment and Operations. Building Equipment and Home Appliance. NJID.300.1. December 31, 1971

108. **Mitigation:**

- All machinery, equipment and vehicles should be maintained in a good condition by engaging skilled mechanics and regularly maintained in compliance with National Emission Standards (1994). Noise control regulations stipulated by the CEA in 1996 (Gazette Extra Ordinance, No 924/12) should strictly be implemented for crushers, construction vehicles and equipment.
- Contractor must ensure that all vehicles and equipment used in construction shall be fitted with exhaust silencers.
- At the construction sites, noisy construction work such as crushing, operation of diesel generator sets, use of high noise generation equipment shall be stopped during the night time between 10:00 p.m. to 6:00 a.m.
- The maximum permissible noise levels at boundaries of the land in which the sources of noise is located for construction activities will conform to IFC-WB EHS mix development standards. This is in line with the SPS 2009 requirements. These standards override the NEA standards. Refer Table 15 below.

Table 15: Comparison of Noise Level Standards

NEA standards			**IFC Guidelines**	
	Day time 6am-7pm	Night time 7pm-6am	Daytime 07:00 - 22:00	Nighttime 22:00 - 07:00
Commercial Areas	65	55	70	70
Industrial Area	70	60	70	70
Mixed Residential/ Residential; institutional; educational	65soil	55	55	45

E. Fauna and Flora

109. **Construction Impact** (The species richness presently in the subproject area and the surroundings are moderate to high and it is in close proximity to ecologically important locations and high biodiversity areas.)

- Activities such as site clearing, and removal of trees and green cover vegetation and will potentially impact on the ecological resources of the area by means of disturbing habitat, contribute towards deforestation, increase soil erosion and surface runoff.
- Construction will lead to noise and vibration at the subproject site disturbing the fauna in the forested area.
- There are very few invasive species in the area and there is a risk of construction machinery introducing them to area.

110. **Mitigation:** Adoption of certain practices of mitigation will ensure that the subproject land and its surrounding habitat will contribute toward minimal degradation.

- Only required land area (0.38ha according to the RBA) will be cleared for the development of the FT. In other areas the natural habitat will be maintained around the FT.
- Demarcate a Biodiversity Conservation Area within SUSL premises to compensate for the loss of forested area to assure the long-term sustenance of the threatened and endemic species identified at the subproject location.
- Carry out habitat enrichment during landscaping. Refer RBA carried out for SUSL subproject location for recommended species. For the habitat enrichment process, light demanding plant species such as *Macaranga peltata*, *Alstonia sp*. etc can be introduced for the newly opened areas. As a second step, more shade loving plant species such as *Cinnamomum citriodorum, Syzygium zeylanicum* etc. can also be introduced.
- Actions should be taken for speedy cleaning up of oil spills, fuel and toxic chemicals in the event of accidents.
- Care has to be taken not to introduce any alien invasive species to the area through construction machinery.
- All the construction workers and staff of the project unit should be made aware and educated about the value of the existing natural environment. Environmental awareness program should be provided to the Contractor, labours and all staff deployed at the site.
- All staff / workers should be instructed not to disturb or harm any fauna seen near the subproject area.
- Noise has to be kept under control by regular maintenance of equipment and vehicles. “No honking” board shall be placed near the boundaries. Noisy activity shall be prohibited during night time.
- Construction debris should not be dispose in the forested areas.

111. **Operational Impact:** Unless awareness is raised, and care is not taken, forested areas can be further degraded by dumping of garbage by students and workers. Also, unplanned expansions can also lead to deforestation and degrading of the environment.

112. **Mitigation:**

- SUSL themselves have recommended that a long-term biodiversity monitoring program in natural habitats left naturally within the proposed site/university premises be carried out, with the support of the Society of Natural Resources Studies (SNRS) under the guidance of the Department of the Natural Resources, Faculty of Applied Sciences, Sabaragamuwa University of Sri Lanka.
- Should demarcate clearly and make official the Biodiversity Conservation Area within SUSL.
- Sign boards should be put up declaring the need to protect the natural habitat and indicate that no dumping of garbage will be allowed.
- Signage of flora and fauna present in the forested areas will stimulate and encourage interest in students and staff in conservation and recreation activities related to the resources at hand.

F. Waste Disposal and Sanitation

1. Solid waste

113. **Construction Impact**

- Solid waste associated with construction and other related works (construction debris, spoil, and waste generated from labour camps, officer's accommodations) may impose several negative environmental and social impacts to the project affected area including impact on ecology, public health and scenic beauty. The local PHI. expressed concern on construction related waste disposal at the stakeholder meeting. Solid waste management is significant problem with the demographic growth and development experienced in the IPS area.
- Labour camps, garbage disposal sites and material storage yards provide favorable habitats for vectors of diseases like mosquitoes and rats. Decaying wastes attract pests such as rats and flies which become unhealthy, dirty, and unsightly. Contamination of water bodies with wastewater, construction debris and spoil will create significant impact on aquatic lives and people inhabiting the area.

114. **Mitigation**

- Contactor and the site engineers should consult the Imbulpe Pardeshya Sabha (IPS) at the onset of the project on waste collection and disposal. Coordinate with the PHI and develop a suitable mechanism for disposal.
- Selected disposal site by the contractor should exclude areas which are close to public and environmentally sensitive areas. Prior approval for the disposal site should be obtained from IPS via Grama Niladhari.
- All debris and residual spoil materials (soil, sand, rock, and deadwoods) generated from construction activities shall be re-used wherever possible for site leveling, back - filling under instruction of State Engineering Cooperation (SEC), Engineers from PIU. Dump materials should be placed without interference to the irrigation canals, water bodies, agricultural lands or any other environmentally sensitive sites
- Proper solid waste disposal, sanitation and sewerage facilities (drinking water, urinals, toilets and wash rooms) should be provided to the site of construction/labour camps. Location of labour camps should be approved by the SEC Engineer and comply with guidelines/recommendations issued by CEA and IPS.
- Colour coded bins be provided at the labour camps.
- No burning will be carried out on site
- Come to an agreement with the IPS on solid waste disposal until the Pilsaru project is implemented under with biodegradable waste will be handled .They need to introduce waste sorting I the campus.
- Clearing of construction camp and restoration. Contractor to prepare site restoration plans for approval by the engineer (PIU). The plan is to be implemented by the contractor prior to demobilization. On completion of the works, all temporary structures will be cleared away, at the contractor's expense, to the entire satisfaction of PIU.

115. **Operational Impact:** Waste disposal and sanitation becomes an important consideration with the occupancy level of the FT buildings. Currently SUSL is having problems with the disposal of its wastewater and sewage leading to contamination of waterways in the area according to the area MOH office. Domestic solid waste will be generated as a result of cooking activities within the canteens and consumption of packed food brought in by the students. As solid waste would not be disposed daily and since Imbulpe is already having a waste management problem, piling up of waste will obscure the environment and lead to health risks. Further solid waste from laboratories including e-waste, solar panels, etc will be generated.

116. **Mitigation:**

- Until a sustainable and self-sufficient solid waste management plan is developed within the FT enter into an agreement with the IPS for waste collection and disposal on a daily basis. Develop a schedule for collection with the consensus of the IPS. Provide the information to the janitorial staff within the FT. Allocate budgetary provisions within the FT budget for their services.
- Develop a composting mechanism for FT. Especially for the kitchen waste generated from the canteens. Establish a composting program and include a space provision in the design for this activity. Fast track the financial support and guidance offered by CEA for the composting project under the Pilisaru program.
- Train the students on importance of social responsibility and garbage disposal. Provide colour coded bins at several locations to encourage source separation.
- Ensure demarcated solid waste storage area with source separation for organic waste and other domestic non-organic waste. This storage facility should be able to accommodate solid waste up to 7 days until disposal. This should be incorporated in to the detailed design of the FT.
- Come to an agreement on with the services provider on disposal of mechanical waste generated as result of maintenance work on equipment and computers and machinery, solar panels etc. procured for FT.
- Illegal garbage dumping & firing is banned.

2. Waste water and sewage

117. **Impact:** Unregulated disposal of domestic waste water and sewage will impact the ground water table and surrounding waterways. Currently SUSL domestic waste water and sewage that has been collected is disposed to an open waste sludge tank within the university premises. The unregulated disposal of sludge has caused the leachate to pollute the ground water table and the surface water in the adjoining villages and the issue has been taken u by the MOH. Therefore, special attention and priority need to be given to the establishment of the wastewater treatment facility and sewage management.

118. **Mitigation**

- Waste water treatment plant needs to be established upon calculation of the water requirement (for about 500 people if only for the FT) and the out-flow rate. The wastewater treatment plan should be shared with ADB.
- Ensure that the domestic waste water is directed to waste water treatment plant in conformity with the CEA, Local Authority guidelines and should not be discharged to the environment prior to the treatment. See Table 16 for expected

standards. This is also applicable to any wastewater released for labour camps during construction. The proposed SLSI standards guideline is comparable to European Guidelines and is adopted nationally.

- Till discharge, sewage will be stored in sealed septic tanks. It is recommended that UOSL FT also looks into establishing a sewage treatment plant to address the current issue of leachate at SUSL.

Table 16: Waste Water Quality Standards

Parameter	Unit	Bathing Water	Raw water for Drinking	Agriculture Water
Colour	Pt units.	-	100	-
pH	-	6.0-9.0	6.0-9.0	6.0-8.5
Conductivity	dS/m	-	-	0.7
Nitrates	mg/l	5	5	5
Total phosphate	mg/l	0.7	0.7	0.7
BOD5	mg/l	4	5	5
Total coliform	MPN/100 ml, (*P=95%)	1000	5000	1000
Fecal coli form	MPN/100 ml, (*P=95%)	50	-	-
Aluminum	mg/l		0.2	0.5

- IPS should be consulted and an agreement should be in place as to who will empty the sewers and where it will be discharged. Any release of sanitary sewage discharge should conform to IFC-WB EHS standards which override the national standards. This is in line with the SPS 2009 requirements. Refer Table 17 for standards.

Table 17: Sanitary Sewage Discharge Water Quality Standards

NEA standards Tolerance limits for discharge of effluents into public sewers with central treatment plants			**IFC-WB EHS Guidelines 2007 Indicative Values for Treated Sanitary Sewage Discharges**	
	Unit type of limit	Tolerance limit values	Units	Guideline Value
pH			pH	6-9
BOD	mg/1, max.	350	mg/l	30
COD	mg/1, max.	850	mg/l	125
Total nitrogen	mg/1, max.	500	mg/l	10
Total phosphorus			mg/l	2
Oil and grease	mg/1, max.	30	mg/l	10
Total suspended solids	mg/1, max.	500	mg/l	50
Total coliform bacteria			MPNb / 100 ml	400a

- In instance of overflow, leaks, immediate repairs should be carried. Establish and collaborate with the Local Authority under such circumstances.
- Apart from provision of the mitigation measures, water quality shall be monitored to understand the effectiveness and further improvement in designs in reducing the concentration of pollutants. The monitoring plan shall be functional in

construction as well as in operation stages. Once the detail pans are available monitoring points and the intervals will be decided by the Environmental Officer.

G. Design of FT Buildings under the Green Building

119. **Impact:**

- Flaws in the FT design may lead several negative impacts that may influence the students' wellbeing and function of the university complex.
- In the absence of water conservation and energy efficiency of the building structure, it may lead to resource constrains and increase the running cost.
- Lack of thermal circulation and lighting condition within the school complex will increase the electricity requirement and cause occupational safety issues for the students and staff.
- In the absence of a properly designed waste water and solid waste disposal system in the university complex, it may lead to health and environmental degradation of the immediate surroundings. Lack of provision of adequate sanitary facilities for the maximum capacity of students and staff can lead to sanitation issues. This may lead to outbreaks of illnesses among the student population.
- In the absence of a disability access such as elevators or stair ways in the building design will prevent disable students from enrolling for the training program.
- Unavailability of geotechnical report did not allow recommended mitigations regarding design of building in relation to sub project site.
- All utilities such as water and electricity are in place, however, there may be disruptions within the SUSL complex when obtaining the utilities to the FT subproject site.

120. **Mitigation:**

- FT building design and layout will follow the guidelines of the Green Building SL certification systems so that it is designed for higher performance, lower environmental impact. Under this system a building would be evaluated under eight categories and these include Management (MN), Sustainable Sites (SS), Water Efficiency (WE), Energy & Atmosphere (EA), Material & Resources (MR) , Indoor Environment Quality (EQ) , Innovation & Design Process (ID) and Social & Cultural Awareness (SC) This includes incorporating engineering design which would consider the following:

  a. Usage of recyclable materials like wood substitutes
  b. Installation of sustainable energy efficiency certified equipment
  c. Usage of energy efficient lighting fixtures (LED)
  d. Provision of photovoltaic cells on roofs for solar power
  e. Rain water harvesting structures planned for ground water recharge and rain water collection

- Including safety and health measures with due regard to future maintenance and repairs. The labs and cafeteria kitchen should be equipped with fire alarms and fire extinguishers. Fire and emergency evacuation routes should be incorporated

sufficiently. Gas storage areas should be built in to the designed and should be placed in a place that is ventilated. Demarcate an area within the building design for storage of cleaning equipment and garbage storage until disposal. Though a general room has been identified in the lay out plan, there is no garbage collection area demarcated.

- Design a waste water sewage tank that has a low operation cost and requires minimal maintenance. It should be properly designed to separate the sewage and the bathing water so that it does not exceed the limits of the occupancy level of the building. The choice of technology will depend on volume of wastewater and sewage generated; economy of scale; regulatory requirements, etc. The PIU of SUSL has initiated the process reevaluating the building designs.
- All building in the proposed FT should be solid building on column structures that will withstand high wind conditions. The basement rock structure should be investigated with bore hole casting testing. SUSL need to obtain the geotechnical report and engage with CEA and the UDA to incited the green building process immediately. It is recommended that in the geo technical investigations the ultimate skin friction coefficient (fμ) should be found and it should be less than that recommended in the ICTAD guidelines (ICTAD/DEV/15).
- Contractor should prepare a contingency plan to include actions to be done in case of unintentional interruption of services occurs due to electrical work at the site.This also applies to water supply

H. Risk of Fire and Emergency Preparedness

121. **Operation Impact:** Once the FT building is in operation, there could be incidents of student unrest or technical errors in the laboratories that may trigger off fire**.** This may cause damage to property and risk lives.

122. **Mitigation**: Several mitigation measures can be adopted and these include adoption of disaster risk reduction strategy and preparedness. This would include: Identification of an emergency evacuation point and stairways in the building and placing emergency alarm system in the building to warn the student population of any such situations. Emergency evacuation points and plan should be designed and practiced. All buildings should be adorned with adequate fire extinguishers.

I. Occupational Health and Safety and General Public

123. **Construction Impact**: Absence of an emergency plan and the adoption of occupational safety measures can lead to illness or even death of workers.

124. **Mitigation:** ADB guidelines for contracted should be included in the contract issued to the contractor with any necessary modifications.

- Contractor should organize awareness programs about personal safety for workers. This should provide briefing and training on safety precautions, their responsibilities towards safety, etc.
- Contractor shall comply with requirements for the safety of the workmen as per the International Labour Organization (ILO) convention No. 62, Safety and Health regulations of the Factory Ordinance of Sri Lanka to the extent that is applicable to his contract. Other than that, the contractor has to comply with regulations

regarding safe scaffoldings, ladders, working platforms, gangways, stairwells, excavations, trenches, safe means or entry.

- All workers should be insured including indemnity cover.
- Use of licensed and trained vehicle operators, provision of protective footwear, helmets, goggles, eye-shields and clothes to workers depending on their duty (mixing asphalt, blasting, handling equipment) should be adopted.
- The construction labour camp should be equipped with first aid facilities and a trained personnel onsite in case of an injury.
- Ample lighting around the construction site should be provided during the night.
- Excavated areas for construction should be barricaded using barricading tapes, sign board should be placed. quarry operations, land excavations and blasting should be carried out and supervised by trained personnel.
- Regular safety checks for vehicles and equipment's, allocation of responsibility to relevant personnel, prohibition of alcoholic drinks and other substances which may impair judgment of workers engaged in construction activities, arrangement of proper first aid and transport facilities for injured people, installation of warning signs should be adopted.
- Onsite emergency plan for minor accidents and mishaps will be prepared by the contactor with the consultation of the PMU.
- Develop and implement comprehensive site-specific health and safety plan on Occupational Health and Safety. Include in the health and safety plan measures such as (i) type of hazards in the construction of the Faculty buildings, (ii) corresponding personal protective equipment for each identified hazard, (iii) health and safety training for the site personnel, (iv) procedures to be followed for all site activities, and (v) documentation of work-related accidents.
- Workers engaged in welding works will be provided with welder's protective eye shields.

J. Health and Safety of Trainees

125. **Impact:** There are no anticipated significant impacts during the operation and maintenance of the subproject. However, the students of the faculty may not be aware of occupational safety related issues and the impact associated with it. This may lead to injury and accidents during practical and training. When practical sessions are conducted in the labs, it may lead to emergencies and accidents.

126. **Mitigation:**

- An emergency plan should be in case of a serious accident.
- First aid should be available on site in each of the labs.
- Emergency switches should be properly covered and placed in each laboratory.

K. Food safety guidelines

127. **Impact:** Unless food and safety guideline are carefully adopted, there will be increased risk of health and hygiene of the food that is prepared within the kitchens. If students don't maintain personal hygiene, it could affect their studies as well as the university.

128. **Mitigation:**

- Adopt food safety regulation imposed by the Ministry of Health.
- Train the canteen operators and improve awareness on food and safety and the national guidelines. These include adoption of food safety handling measures.
- Ensure that the waiters and food service personnel practice regular hand washing during working hours especially when entering food handling area.
- Ensure that food service personnel maintain personal hygiene and inform the canteen operator in case there are sick or has an injury.
- Health checks to be done annually on the canteen operating staff.
- Adoption of canteen rules as covering of hair especially in the kitchen area.

L. Induced and Cumulative Impacts

129. According to the ADB Environment Safeguards Sourcebook cumulative impact is described as: “The combination of multiple impacts from existing subprojects, the proposed subproject and anticipated future subprojects that may result in significant adverse and / or beneficial impacts that cannot be expected in the case of a stand-alone subproject.” The sourcebook also describes induced impacts as: “Adverse and / or beneficial impacts on areas and communities from unintended but predictable developments caused by a subproject, which may occur later or at a different location.

- Economic activities supporting FT like lodging and restaurants are expected to increase with new student population and induce development in the subproject area. The subproject area has good infrastructure for training of highly skilled graduates in the technology field. Hence the subproject will train these students in the technology field to be involved in the industrial activities.
- Location of the subproject in Imbulpe supports non-academic staff requirement from the Sabaragamuwa province. Preference will be given to local community over other during recruitment for these positions. This will be especially true for janitorial services and security services.
- The construction of the FT will provide better technologically trained graduates to meet the future demands of the industry. This will lead to (i) Reduction in travel time to access well-resourced laboratories that are located in different places in the district (ii) state-of-the-art material science, micro biology, food science, electric and electronic labs and research labs to carry out education and research (iii) access to new teaching and learning methods (iv) competitive edge to secure quality job that ensures personnel security (v) being connected to proposed industrial areas, increased opportunities to collaborate with local and overseas companies engaged in logistics and supply chain management activities.
- In terms of environment safeguard issues, the subproject is expected to enhance the disturbed surroundings with habitat enriched green building on site. However, during the operation phase, the solid waste and waste water treatment will generate issues if not properly managed. Improvement in local economic conditions can also result in unorganized and illegal establishment of settlements and businesses adjacent to the subproject that may pose new problems of social issues. To address these potential problems, relevant local authorities will have to monitor developments and strictly enforce rules.
- To mitigate any negative impacts on the surrounding communities as a result of activities taking place at the FT, consultations should be continued with the

community from time to time. It is important to include all relevant stakeholders so that issues can be resolved early.

M. Climate Change Impact and Risk

130. Changes in the atmosphere have been detected that could drastically alter the climate system and the balance of ecosystems. Rising CO_2 concentrations increase the energy retention of Earth's atmosphere, leading to a gradual rise of average temperatures and global warming. This leads to unprecedented changes in the weather patterns including precipitation levels, intensities and frequencies.

- **High Precipitation Impacting soil stability:** Heavy rains can cause heavy erosion and runoff. Since the subproject is on a sloping exposed terrain. Severe runoff may lead to earth slips
- **Tornados and Lightening**: Due climatic condition of high wind tornados and precipitation lighting strike could be experienced. There is a risk of fire or property damage as the high tension electrical wires are located in close proximity to proposed industrial center at the FT.

131. **Mitigation**: Several mitigation measures can be adopted and these include adoption of temporary flood risk reduction strategy. This would include:

- A drainage management plan should be developed for the site to ensure protection from heavy runoff and erosion.
- Adopt measures suggested by CEA, and NBRO
- Building should be designed to withstand extreme weather condition such as high wind and rainfall.
- Precautions should be taken against landslides through the area is not identified directly as a risk area, there is always potential for the risk to develop the Balangoda region has reported landslides
- Ensure that the building and the equipment is properly insured for claims of natural disaster and lightning resistors installed. The building design be designed, and material used should withstand tornadoes and high wind speeds.

VII. PUBLIC CONSULTATION

A. Approach to Public Consultation

132. Public Consultation Meeting (PCM) provides an opportunity for the general public, private and community bodies to know the environmental and social impacts as a result of project implementation. Thus, the meeting was held for residents around the project areas, public sector and private sector agencies who are concerned with the project during the initial stage. Major purpose of the public consultation is to identify the environmental issues in the IEE study and to appraise the stakeholders on potential environmental impacts. This will provide an opportunity to collect their feedback so that adequate safeguards can be considered during the planning phases.

133. Venue for the meeting was fixed at the meeting room of SUSL. Affected communities and potential stakeholders such as an official from Imbulpe DSD, Grama Niladari from Muththettuwegama (location of the land), PHI (SUSL), FT students and academic staff, villagers from Muththettuwegama etc. were invited to attend the meeting. Effort was made to make the gathering representative of the local population directly or indirectly affected by the potential impacts. There were 23 stakeholders at the meeting. (Annex 11 provides the participant list). There was no female representation at this meeting. However, since the representation of the relevant authorities was thought not sufficient and also suppressed, the TA team consulted individuals over the phone for additional information.

B. Methodology

134. Discussions, Questions and Answers: In the meeting, the participants were informed of the proposed project and potential environmental impacts due to the project. Thereafter, time was allowed for questions and answers to facilitate interaction with the stakeholders, exchange of information, collect their opinion on the environmental issues and any other issues that needed addressing. See Figure 13.

135. **Collection of Feedback**: A feedback questionnaire in local language (sinhala) was presented at the common forum and then asked each of the stakeholders to express their views regarding the question. These questions were presented by the consultants conducting the meeting and answers sourced. (refer Annex 11)

136. 5 provides the list of questions presented. Participants were encouraged to provide their opinion through the feedback questionnaire, however it was kept voluntary. Some of the participants could not fill the forms as they could not read or write.

137. **Record of the Meeting**: General information of the participants such as Name, gender, and name of the organization the participant belongs to along with their signature was recorded during the public consultation meetings and is attached in the report as Annex 11. Registration was kept voluntary. Almost all of the participants registered themselves.

138. A total of 23 stakeholders participated in public consultation meeting. Information was gather on following topics. In the public consultations, while females are invited, there was no female participation, and a few female consultations are conducted individually after the public consultations.

- Perception of building stability and the lay out plan
- Perception on noise vibration and dust
- Perception on grown water quality in the area adjacent to the site
- Perception on the water drainage and soil erosion
- Perception on ecology and biodiversity issue
- Perception of the connectivity to the project site through the road network
- Perception of community befits as result for the FT complex
- Perception of the education offered at the faculty
- Perception of the solid waste management by the IPS
- Perception of the waste water management at the new FT premises
- Perception of the community settlement and access road usage for adjoin settlement at the project site
- Approval of green building certificate

139. **Outcome of the Public Consultative Meeting:** The following are the major points of concern of the participants of PCM. Detailed account of meeting is provided in Annex 11.

- Design and implement a drainage plan for the project and improve soil conservation measures. Importance of liaising with NBRO
- Reservation limits to be maintained minimize the impact of the project on the Samanala wewa.
- Managing noise, dust and vibration at the site.
- Importance of obtaining clearance from IPS, CEA, and UDA for the project.
- Contact IPS on the future plan concerning the solid waste management of the university. Enter into a temporary agreement on removal of solid waste until the composting program is established within the university.
- Establishment of a waste water treatment plant.
- Importance of students maintaining communal harmony with the local villagers

Figure 13: Plates of Stake Holder Meeting

VIII. GRIEVANCE REDRESS MECHANISM

A. GRM Process

140. The affected person(s)/aggrieved party can give their grievance verbally or in written form to the local site office of FT site at Belihul Oya. Grievances of affected person will first be brought to the attention of the site in charge, who can resolve the issue at the site level with immediate effect which should be addressed within 7 days. If the matter cannot be resolved at the site level it will be referred to project coordinator of SUSL PIU. In event that it is not solved within 7 days by the PIU (Project Coordinator), it will be brought to the Grievance Redress Committee (GRC) which will be appointed by the PMU of the MHECA. The GRC will comprise of State Secretary of MHECA, Project Director, religious leader from village, Grama Niladari, and community leader from village Complaints shall be submitted to the Project Director to be presented at GRC.

141. The GRC will take up any issues during its monthly meeting and provide a solution within two weeks. If the matter is not resolved by GRC at PMU level within stipulated time, it shall be referred to Land Use Committee of the region. It will meet at least once a month. The agenda of the meeting will be circulated to all the members and the affected persons/aggrieved party along with venue, date and time at least a week prior to the meeting.

142. Any aggrieved party may access the country's legal system at any stage. Legal redress can run parallel to the GRM and is not dependent on the negative outcome of the GRM.

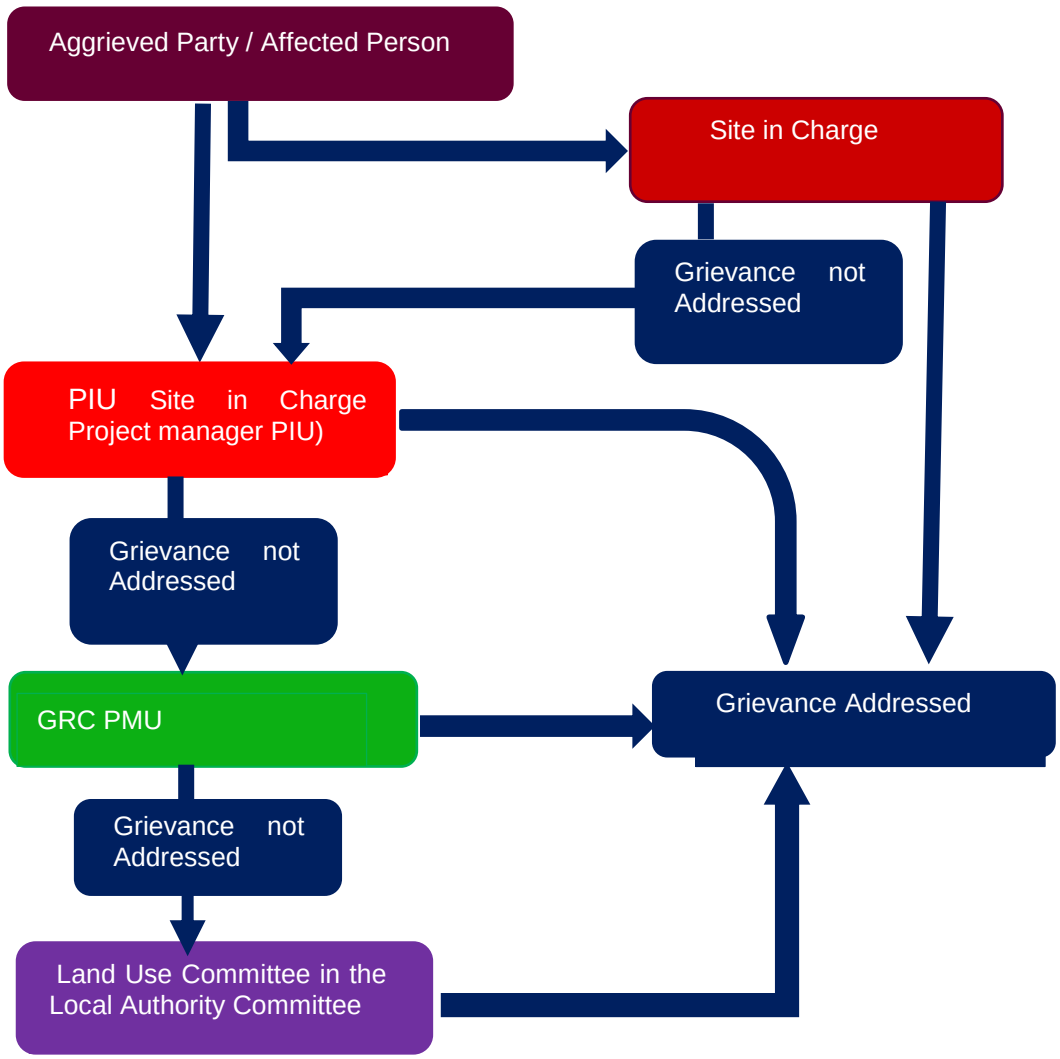
B. Registering Complaints

143. The PIU and site office shall keep records of all grievances received including contact details of complainant, date of receiving the complaint, nature of grievance, agreed corrective actions and the date these were affected and final outcome. For this a complaint register will be maintained at each sub-subproject site. The complaint will be registered by the aggrieved party by duly filling the form provided, (refer Annex 12) PIU established a public response center (PRC) helpline specifically addresses the issues arising out of subproject implementation. Compliant can be registered via any of the following means: Through Public Response Center Help Line.

Land Line Number:
Mobile No:
WhatsApp:
E-mail:

144. In the event that the complainant is illiterate, the complaint will be recorded with the assistance of site in charge. The cost for functioning of GRC will be accounted for by PMU of MHECA. The GRC mechanism may need further review once the implementation sets in. Figure 14 show the GRM implementation structure.

Figure 14: Grievance Redress Mechanism of SUSL



IX. ENVIRONMENTAL MANAGEMENT PLAN

A. Environmental Management Plan

145. An environmental management plan (EMP) has been developed to provide mitigation measures to reduce all negative impacts to acceptable levels (refer Part III). The EMP will guide the environmentally-sound construction of the subproject and ensure efficient lines of communication between MHECA, project management unit (PMU), project implementing unit (PIU), consultants and contractors. The EMP will (i) ensure that the activities are undertaken in a responsible non-detrimental manner; (i) provide a pro-active, feasible and practical working tool to enable the measurement and monitoring of environmental performance on site; (ii) guide and control the implementation of findings and recommendations of the environmental assessment conducted for the subproject; (iii) detail specific actions deemed necessary to assist in mitigating the environmental impact of the subproject; and (iv) ensure that safety recommendations are complied with. The EMP includes a monitoring program to measure the environmental condition and effectiveness of implementation of the mitigation measures. It will include observations on- and off-site, document checks, and interviews with workers and beneficiaries.

146. The contractor will be required to submit to PIU, for review and approval, a site environmental plan (SEP) including (i) proposed sites/locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous wastes; (ii) specific mitigation measures following the approved EMP; (iii) monitoring program as per SEP; and (iv) budget for SEP implementation. No work will commence prior to approval of SEP. A copy of the EMP/approved SEP will be kept at the site during the construction period at all times. The EMP will be included in the bid and contract documents. Non-compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance.

147. For civil works, the contractor will be required to (i) carry out all of the mitigation and monitoring measures set forth in the approved SEP; and (ii) implement any corrective or preventative actions set out in safeguards monitoring reports. The Environmental consultant will carry out quarterly reviews against the EMP. The contractor shall allocate budget for compliance with these SEP measures, requirements and actions.

B. Implementing Arrangement

148. MHECA of Government of Sri Lanka will be the Executing Agency for the Program, responsible for management, coordination and execution of all activities funded under the loan. A central Project Management Unit (PMU) attached to MHECA will be responsible for implementing the Technology and Human Resource Development Project. The PMU will be supported by Program Implementation Units (PIUs) such as SUSL with flexibility to re-deploy depending upon the implementation requirements. The PMU and PIUs will be supported by several teams of Design Consultants in preparation of preliminary engineering designs.

149. Project Management Consultant (PMC) centrally located at PMU and with field teams located in PIUs shall be responsible for implementation of the Program. All infrastructure contract will be procured through performance-based contracts (PBCs) and include build operate (BO) framework. Based on the preliminary designs prepared by Design Consultants, the DBO (design-build-operate). The preparation, review, and approval of subproject design and due diligence studies including bidding process is centralized at the PMU. PIU of SUSL will

provide necessary support to PMU in preparation, and will play main role in supervising the construction process.

150. The PMU of, MHECA has no capacity to manage the associated environmental impacts. Therefore, they will need to recruit an environmental safeguards consultant to carry out the reporting and monitoring process. The terms of reference (TOR) of the environmental safeguard consultant is drafted and enclosed as Annex 13. This will ensure that MHECA will comply with the requirements of the Government and ADB. PMU of MHECA will prepare a draft TOR for environmental safeguard consultant and send it to ADB for comments before loan negotiations.

151. The PMU will continue to monitor and measure the progress of EMP implementation. The monitoring activities will be corresponding with the subproject's risks and impacts identified in the IEEs for the subprojects. The PMU and PIU will continue to undertake site inspections, document review to verify compliance with the EMP and progress toward the final outcome and recording information of the work, deviation of work components from original scope. PMU will submit environmental safeguard reports to ADB. PMU and PIU will review the environmental safeguard reports and take necessary action to mitigate issues.

152. Safeguards consultant will submit quarterly monitoring and implementation reports to the project director at PMU during the construction phase which will be sent to ADB on a bi-annual basis. For operational phase the reporting requirement to ADB will be annual. Regular monitoring will have to be carried out by the PIU to ensure the compliance with the EMP. The PMU will submit semi-annual monitoring reports to ADB according to a suggested monitoring report format agreed by ADB for subprojects.

153. EMP budgets will reflect the costs of monitoring and reporting requirements. Monitoring reports will be posted in a location accessible to the public. The executing agency will document monitoring results, identify the necessary corrective actions, and reflect them in a corrective action plan. The MHECA, will study the compliance with the action plan developed in the previous review. Compliance with loan covenants will be screened by the executing agency.

154. ADB will review project performance against the MHECA's commitments as agreed in the legal documents. The extent of ADB's monitoring and supervision activities will be commensurate with the project's risks and impacts. Monitoring and supervising of social and environmental safeguards will be integrated into the project performance management system. ADB will monitor projects on an ongoing basis until a project completion report is issued. Any changes on the IEE based on the detailed design and/or due to any change in design, location, unanticipated impacts identified during the project implementation will be subject to ADB review and disclosure on ADB website. ADB will carry out the following monitoring actions to supervise project implementation:

- Conduct periodic site visits for projects with adverse environmental or social impact;
- Conduct supervision missions with detailed review by ADB's safeguard specialists/officers or consultants for projects with significant adverse social or environmental impact;
- Review the periodic monitoring reports submitted by executing agency to ensure that adverse impacts and risks are mitigated as planned and as agreed with ADB;

- Work with executing agency to rectify to the extent possible any failures to comply with their safeguard commitments, as covenanted in the legal agreements, and exercise remedies to re-establish compliance as appropriate;
- Prepare a project completion report that assesses whether the objective and desired outcomes of the safeguard plans have been achieved, taking into account the baseline conditions and the results of monitoring**.**

155. The costs for environmental safeguard activities which are responsibilities of the PMU and PIU are included in respective consultant packages. The cost of mitigation measures during construction stage will be incorporated into the contractor's costs. Thus, remaining costs related to environmental safeguards cover the following activities

- Preparing and submitting reports and public consultation and disclosure
- EPL applications
- Conduct of environmental monitoring for baseline data and long-term evaluation of the infrastructure
- Replacement and maintenance of trees, as necessary
- Conduct of environmental capacity-building lectures and workshop for improving awareness.

156. The budgetary provision for the implementation of the EMP of the subproject can be categorized in to two types and is presented below.

- Environmental Management Plan Works to be implemented by the contractor under civil works contracts
- Environmental Management Plan Works to be implemented by the FT.

157. A capital cost provision of about US$12500 has been kept towards implementation of the environmental management plan. Summary of environmental budget is presented in Table 18.

Table 18: Summary of Environmental Budget

Item	**Quantity**	**Unit Cost (US$)**	**Subtotal Cost (US$)**	**Source of Funds**
Administrative Cost				
Public Consultations	Bi annually	1000	4000	Project Cost - PMU Costs (to be paid under incremental administration cost)
Environmental Monitoring			4500	
Design Stage to establish baseline environmental data	Air, water and noise monitoring	1500		Project Cost - PMU Costs (to be done under the guidance of PMC / by PIU staff and accounted under incremental administration

				cost
Construction Phase	Air, water and noise monitoring	1500		Civil Works Contractor Costs
O & M	Air, water and noise monitoring	1500		PIU/PMU cost
Landscaping and tree-planting		2500	2500	
Capacity Building Expenses		1500	1500	On job training is done by PIU Any other workshops and/or sessions on these will be under Project Cost -PMU Costs and accounted under Capacity Building expenditure
Total Cost			**12500**	

Table 19: Monitoring Plan for FT for Preconstruction, Construction, and Operation Phases

Sl No	**Field environment attribute**	**Phase**	**Parameters to be monitored**	**Location**	**Frequency a**	**Responsibility**
1	Air quality	During preconstruction	IFC-WB EHS standards in chapter 6	FT construction at SUSL	Once in the preconstruction phase to establish baseline	Contractor through approved monitoring agency
		During construction phase			Once in every 3 months (except monsoon season) during construction phase (24 months construction phase)	
		During operation phase			Once bi-annually except during monsoon season during first 2 years	

2	Water quality	Preconstruction	IFC-WB EHS and SLSI standards in chapter 6	FT or SUSL groundwater	Once to establish the groundwater quality before construction	Contractor through approved monitoring agency
3		During construction Phase			Once in every three month during construction phase	
4		During operation phase			Once every year except during monsoon during two years	
5	Noise levels	During preconstruction phase	IFC-WB EHS standards in chapter 6	FT or SUSL construction site	Once in the preconstruction phase to establish baseline	Contractor through approved monitoring agency
6		During construction phase			Once in every 3 months (except monsoon season) during construction phase	
7		During operation phase			Once every season except monsoon season for first 2 year	

C. Environmental Monitoring and Reporting

158. The FT at SUSL will monitor and measure the progress of EMP implementation while supervising civil construction activities. PIU will undertake site inspections and document review to verify compliance with the EMP and progress toward the final outcome. PIU will submit quarterly EMP monitoring and implementation reports to PMU of the MHECA, who will take follow-up actions, if necessary. The MHECA will review and consolidate the quarterly reports to prepare bi-annual monitoring reports to ADB during construction and thereafter, on an annual basis.

159. ADB will review subproject performance against the executing agency's commitments as agreed in the loan documents. The extent of ADB's monitoring and supervision activities will be commensurate with the subproject's risks and impacts. Monitoring and supervising of social and environmental safeguards will be integrated into the subproject performance management system. ADB will monitor subprojects on an ongoing basis until a project completion report is submitted.

D. Consultation and Information Disclosure

160. Consultation. To ensure continued public and stakeholder participation in the FT subproject life cycle, periodic consultations shall be taken up at regular intervals at site during implementation. This participatory process will ensure that all views of the people are adequately reviewed and suitably incorporated in the design and implementation process.

161. Once the IEE is approved by the ADB, an electronic version of the IEE will be placed in the official websites of ADB. Upon written request, any person seeking information can obtain a hard copy of the complete IEE document by paying for its photocopying cost. The PMU will issue notification on the disclosure mechanism in local newspapers, ahead of initiation of implementation of the subproject, providing information on the subproject, start dates, etc. The notice will be issued by the PMU in local newspapers 1 month ahead of the implementation works. This will create awareness of the subproject implementation among the public. In addition, any revisions to the IEE will be disclosed to the project stakeholders.

X. CONCLUSION AND RECOMMENDATIONS

A. Conclusion

162. The IEE study did not find an adverse incompatibility with the surrounding physical, biological, socio-economic or cultural environment and does not pose any significant long term environmental threat if all identified mitigation measures are carefully attended to. The most likely impacts during the construction phase are expected to be temporary in nature and could be mitigated with proper management and good practices. The GRM and EMP provide appropriate guidance for suitable environmental and social safeguards. Accordingly, the proposed project can be recommended for implementation with strict adherence to the EMP and GRM provided in this IEE.

163. The main environmental impacts that need close mitigation identified for the FT subproject at SUSL are the management of waste, erosion and loss of biodiversity through deforestation for construction. Therefore, specific recommendations have been made towards mitigating or minimizing the impacts of these issues.

164. As per the Government of Sri Lanka regulation, an IEE not required for the proposed project under the National Environmental Act. However, EPL Clearance from CEA, NBRO clearance, Imbulpe Divisional Secretaries clearance, Imbulpe Pradeshiya Saba clearance, UDA green building certificate will be required before start of construction. Already provisional zoning approval has been obtained for the establishment of the FT.

B. Recommendations:

165. **Waste Management:** A comprehensive solid waste management plan should be designed geared towards reduction in waste generation and processing. THE FT should expedite the approved Pilisaru program of CEA (already awarded). As a technology faculty that is trying out modern technology, research should be directed to develop a mechanism that is suitable for solid waste disposal that has no carbon foot printing and zero emissions. Until this is established, SUSL should seek an agreement with the IPS to receive solid waste and dispose of it.

166. A wastewater treatment facility should be designed and implemented without delay for the FT location. It is recommended that a solution to the existing wastewater and sewage issue at SUSL also be resolved without delay. Wastewater treatment facility should be designed to cater for the anticipated outflow rate based on water usage estimates to be calculated after the detailed design. There should be adequate funding allocated for the operation of the facility though out FT operation and its maintenance. The sewage management also needs to be discussed. Instead of dumping in an open pit, discussions should be made with IPS on removal of the sewage sludge through gully bowsers from time to time. All effluent should adhere to either the national standards or the IFC-WB EHS standards.

167. It is also recommended that SUSL look into a swage management facility for the overall campus if not at least for the FT as there is currently a problem that need to be resolved urgently.

168. **Erosion and possible earth slips**: A water drainage plan should be developed for the site with proper drains. Preventive measures should be adopted by FT to minimize soil being transported to the southern boundary where the forest is located. This erosion control plan should include measures to improve the soil condition and NBRO Balangoda Regional Office should be consulted to obtain their clearance and possible recommendations. Since the drainage systems play an important role in the hydrology of the project associated area, SUSL should follow up and develop a schedule to clean and ensure maintenance of drainage at the site and surrounding areas. Funds within the FT should be allocated for such management activities. Precautions should be taken against potential landslides in planning for the future.

169. **Biodiversity and habitat enrichment**: The RBA indicates a moderately high biodiversity at the subproject site. Therefore, it is recommended that minimal clearing be carried out and habitat enrichment be carried out in the opened-up spaces following recommendations in the RBA. It is recommended to demarcate a conservation area within the most diverse forest patch within SUSL premises (close to the southern border) and to commence a biodiversity monitoring program of the forested areas within SUSL. The landscaping of the FT should be done to incorporate the natural environment as much as possible.

170. **Provision of water**: It should be ensured that the construction workers are provided with adequate drinking water from the onset of the construction phase. Due to the water scarcities associated with the site, it is important to secure a water supply through the WASSIP program to be commissioned in 2019.

171. **Clearances:** SUSL FT needs to take measures to initiate the Green Building Certification process with the UDA.

172. **Stability of the foundation**: Since the geo technical information currently available, does not clearly provide information on the recommended structural intervention, it is recommended that it is re-visited once the detailed design is in place.

ANNEX 1: SITE REPORT
(NEW TECHNOLOGY FACULTY DEVELOPMENT PROJECT IN SABARAGAMUWA UNIVERSITY OF SRI LANKA BRIEF SITE INSPECTION REPORT 23 MARCH 2017)

The establishment of a new Technology Faculty is to train undergraduate and graduate students in Engineering Technology and Bio Systems Technology. The site that is identified for development is located within the Sabaragamuwa University of Sri Lanka premises in Rathnapura District, Sabaragamwa Province. See Figure 1.

Sabaragamuwa University of Sri Lanka commenced in 1991 as an affiliated collage to the University of Sri Jayawarhanapura. In 1995 Sabaragamuwa Affiliated University Collage was converted in to National University as the twelfth national university of the country under the Act No.16 of 1978. At present there are six faculties and the total land area of the university is 56 acres.

History of the University

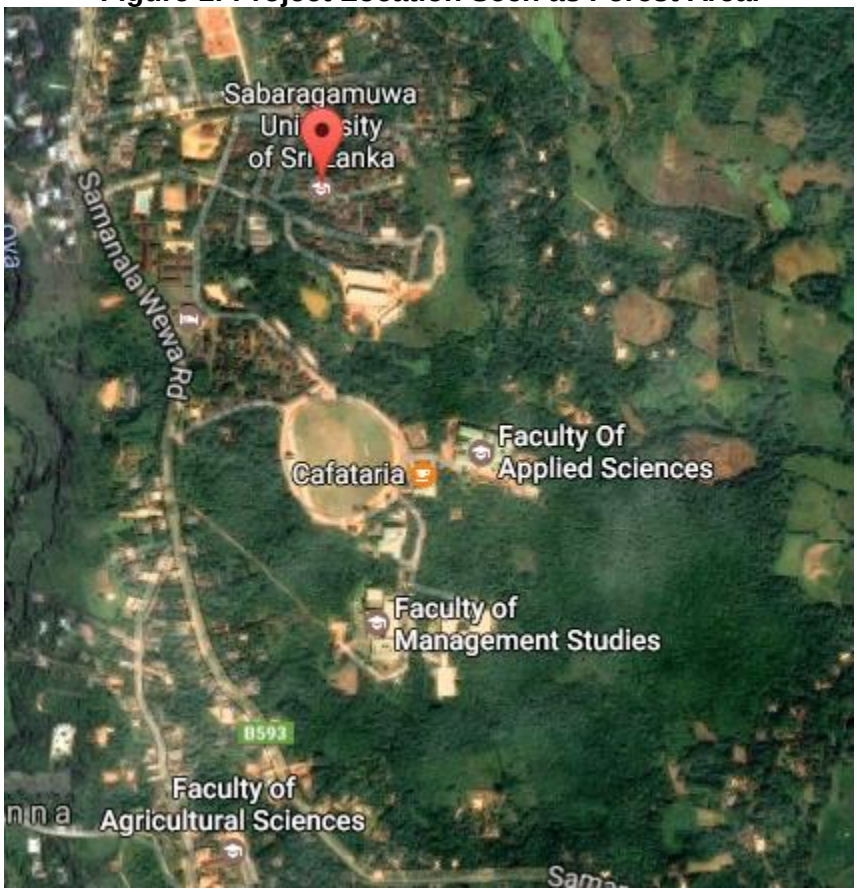
There is a relatively short history for Sabaragamuwa University of Sri Lanka (SUSL) started in 1991 as an affiliated university college to University of Sri Jayewardenepura. The University was given the former Japanese Expatriate Village of Samanalawewa Project in Belihuloya. Academic programs were started form 1992, with three study areas namely; Travel and Tourism Management, Accounting & Finance, and English. The first batch of students was limited to 225 and was served by an academic staff of about 10 with several visiting lecturers from other Universities and Institutions. In 1993, 166 students covering all ethnic groups were taken in and the Department of Study in Travel and Tourism Management was also introduced. In 1995, when the Sabaragamuwa University became a National University, it already had the following facilities: Lecture Halls, an Auditorium, Computer and Language Laboratories and Reading Rooms, Welfare and Medical Centers, an Open-Air Theatre and a Herbarium. The facilities that existed at the premises when taking over from CEB viz, the housing complex, the residences, offices, Gymnasium, Swimming Pool, Tennis Courts and a pipe borne water supply scheme, have made it possible to fulfill as many of the requisites and basic needs of a University". Sabaragamuwa University of Sri Lanka was established on November 07, 1995 as a University under the section 21 of the Universities Act No. 16 of 1978 and was ceremonially opened on February 2, 1996, with four faculties. It was subsequently decided to amalgamate the Uva Affiliated University at Rahangala and Buttala Affiliated University as Faculties of Agricultural Sciences and Applied Sciences, respectively. The Faculty of Agricultural Sciences at Rahangala was shifted to Belihuloya in 2001. Faculty of Geomatics was then established as the fifth faculty, in 2004. The Faculty of Applied Sciences, which was located at Buttala, was also shifted to the main campus in Belihuloya in 2008. At present, SUSL is operating with five faculties and 19 Departments, offering 27-degree programs.

The Sabaragamuwa University of Sri Lanka is located about 162 km away from Colombo along the Colombo - Badulla main road. The main campus of Sabaragamuwa University in Belihuloya possesses sufficient land for future development. It consists of approximately 232 acres as detailed below:

- Main university premises transferred by the Ceylon Electricity Board - 66 acres
- Main playground and building complex (proposed) premises – 56 acres
- University Farm premises – 31 acres

- Non Pareil land – 50 acres
- Other lands – 29 acres (water pumping and purification unit, hostels, nature park and reserve)

Figure 1: Project Location Seen as Forest Area.

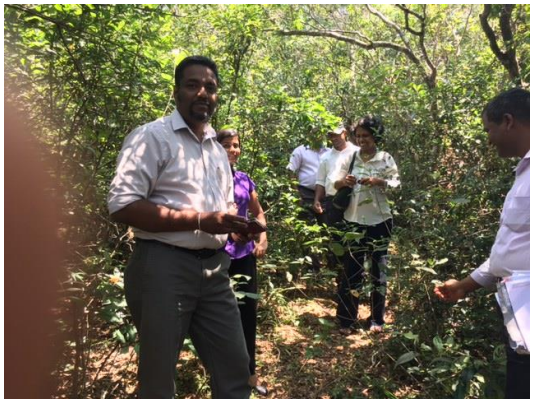


Site Description:

The proposed land for development is owned by University and it is located within the University premises. The new faculty area will occupy an area of more than 25,000 square meters in size (around 6 acres) and will be positioned close to the Faculty of Applied Science. Existing land consist with dry mixed semi evergreen forest patch. The soil is rocky and there is medium slope of about 30-40 degrees.

The proposed development land consists of 2 plots (given in the site survey plan). The land is bounded on the northern side by the lot D, F, E, H, I, J. Eastern boundary is consisting with lot No 51, 75,572,299,360,304,323. The southern boundary adjoins with lot No 360,303,323,322,321 and 320. The western boundary is adjacent to Lot 322,321,320 and lot A, D F, and E.

Figure 2: Proposed Development Land



Proposed Plan

Initial stage of the project will include the construction of the two departments, (Engineering Technology and Department of Bio-systems Technology) under the Faculty of Technology. Annually, 150 students will be enrolled to the proposed new faculty where the faculty will eventually accommodate 600 students during the four-year degree program.

The construction of new faculty building is planned to commence in August 2017. The new Faculty will be constructed in three phases along with the annual intake. The first phase (Phase 1) will be a four story building of 44,000 sq. ft which will include the Dean's Office (1080 sq.ft) with two department offices (360 sq. ft) for administration. In total, 24 academic staff will be recruited at the end of 2018, thus 24 staff rooms (each 60 sq.ft/room) will be constructed during Phase 1. Further, four class rooms (2000 sq. ft in total) and computer laboratory 3000 sq. ft to be used by 100 students at a time.

Two laboratories (6200 sq. ft) will be built for the department of engineering technology and department of bio systems technology. Additionally, a reading room and a student room (1000 and 1600 sq. ft, respectively) will be provided with a capacity for 50 students at a time to carry out their assignments. There will be an auditorium (6000 sq. ft), library (3000 sq. ft), and cafeteria (1600 sq. ft). All development identified above will fall under Phase 1 which is expected to be completed by the end of the third quarter of 2018.

The second phase of building construction will be started in the second quarter of 2018 these buildings for the third and fourth year students. This phase develops four class rooms, eight science laboratories, additional staff rooms for another thirty academic staff members and a reading room.

Third phase of building construction (30,000 sq. ft) is planned for the second quarter of 2019. Activities such as research centers, post graduate studies and research related spaces are planned for the third phase. This development will provide six research centers for nanotechnology, robotics, bioengineering etc. Further, it will include six staff rooms, four class rooms and a reading room.

Recommendations:

We recommend that an IEE be carried out for this site, however, we urge the Sabaragamuwa University of Sri Lanka to obtain government approval as an immediate action. This includes obtaining approval from the CEA and the Forest Department since this will involve the conversion of forest cover exceeding one 1 hectare into non-forest use. Upon these two clearances, there will be a clear definition as to what type of EA (IEE or EIA) will be required under the national legislation.

First a proper assessment need to be carried with respect to the economic viability of the project and the cost involved. It is recommended that a planning specialist with expertise on designing of such a faculty be sought with respect to space allocation and function of rooms that are demarcated. We feel that first stage of development should focus more on providing student training and not building for administrative purpose. This should be done with respect to student intake and cost estimations. The plan that was presented to us during our initial screening focused more on the administrative purposes rather than the actual training of the students.

A proper Biodiversity Assessment needs to be carried out prior to any site clearance. Incomplete studies undertaken by outside parties indicate that there are endemic and threatened fauna found in university forest premises. However, this needs to be confirmed and if so proper measures taken for the conservation of such species during the development.

The proposed development plan should be done with the consultation of ICT regulation bodies in Sri Lanka as well as leaders in that trade. All the and relevant local authority's approval should also be obtained.

It is recommended that the IEE give special attention to the following:

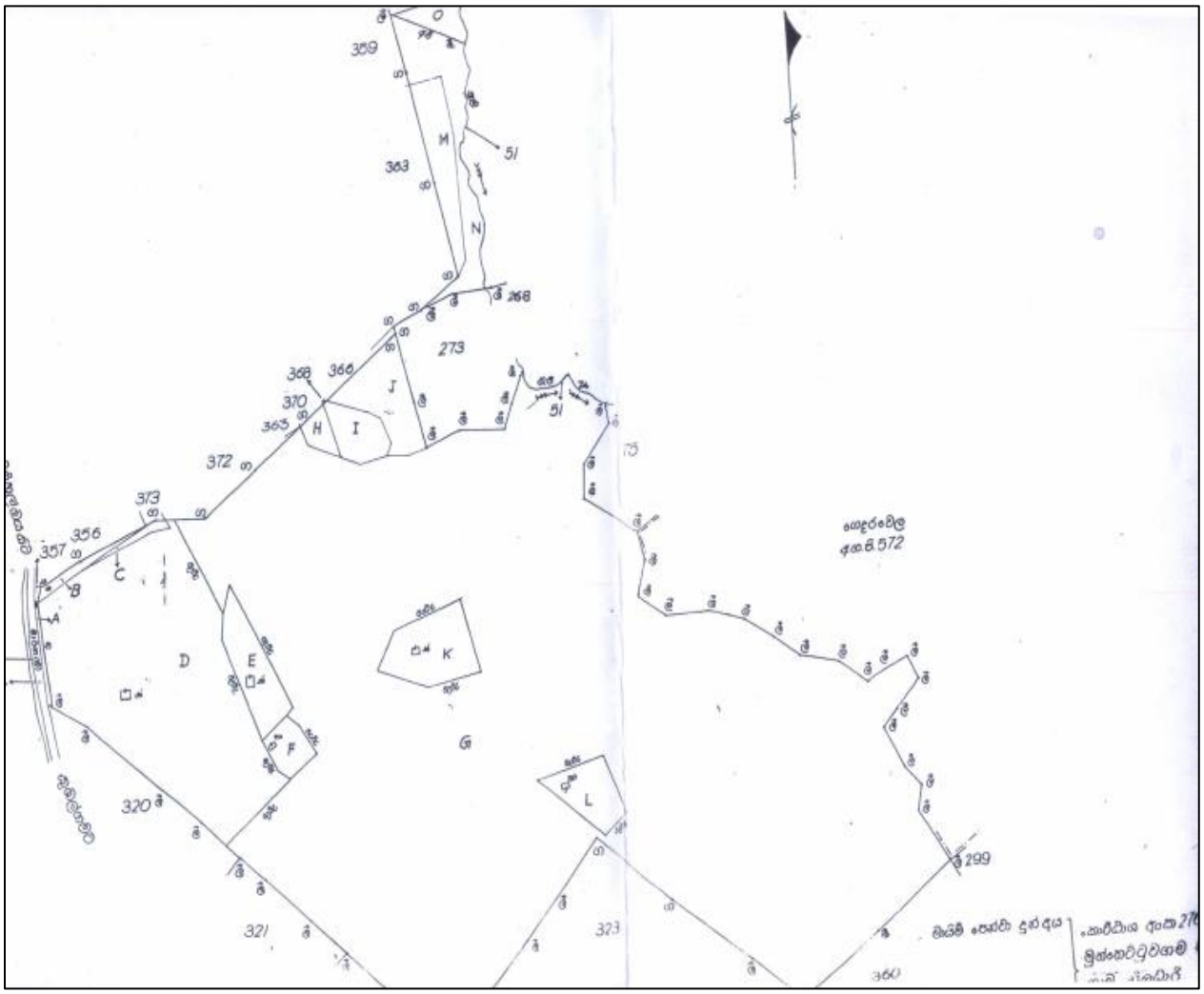
a. Review environmental recommendations provided by the Forest Department and CEA. Considering the magnitude of the project this will be called for an IEE under the national regulations as well at a minimum.
b. Assess the economic viability of the selected site for the purpose with respect to the other available option.
c. Submit an initial screening form to CEA providing particulars of the project (fill out a BIQ for the project) prior to any site clearance or project commencement.
d. Cost estimation and a need assessment for the project (this should include projected intakes of student and the final outcome of such training).
e. Carry out a biodiversity assessment of the flora and fauna in the site. Current studies indicate that endemic fauna is present. It should include conservation significance of a forest patch as a research and practical site for the university and its courses.
f. Review any other work related to water drainage and landslide risk in this area. Avoid the building design on extreme slopes.
g. Provide a soil report with assessment of suitable design. Review of building design and layout to ensure conformity with environmental and social requirements.
h. Management of various categories of waste (domestic liquid and solid waste, laboratory waste, e-waste, etc.) Solid waste and sewage disposal is currently a problem: As a residential university, the whole student population of SUSL is provided with hostel facilities in university hostels or rented houses. Night soil accumulated in these hostels is frequently emptied from the septic tank systems. Proper solid waste and night soil disposal system is a high priority requirement for SUSL. Further, maintaining cleanliness at the university premises appears to be

rather neglected at the moment. The developmental activities that are planned, parallel expansion of these facilities should be considered and proposed.

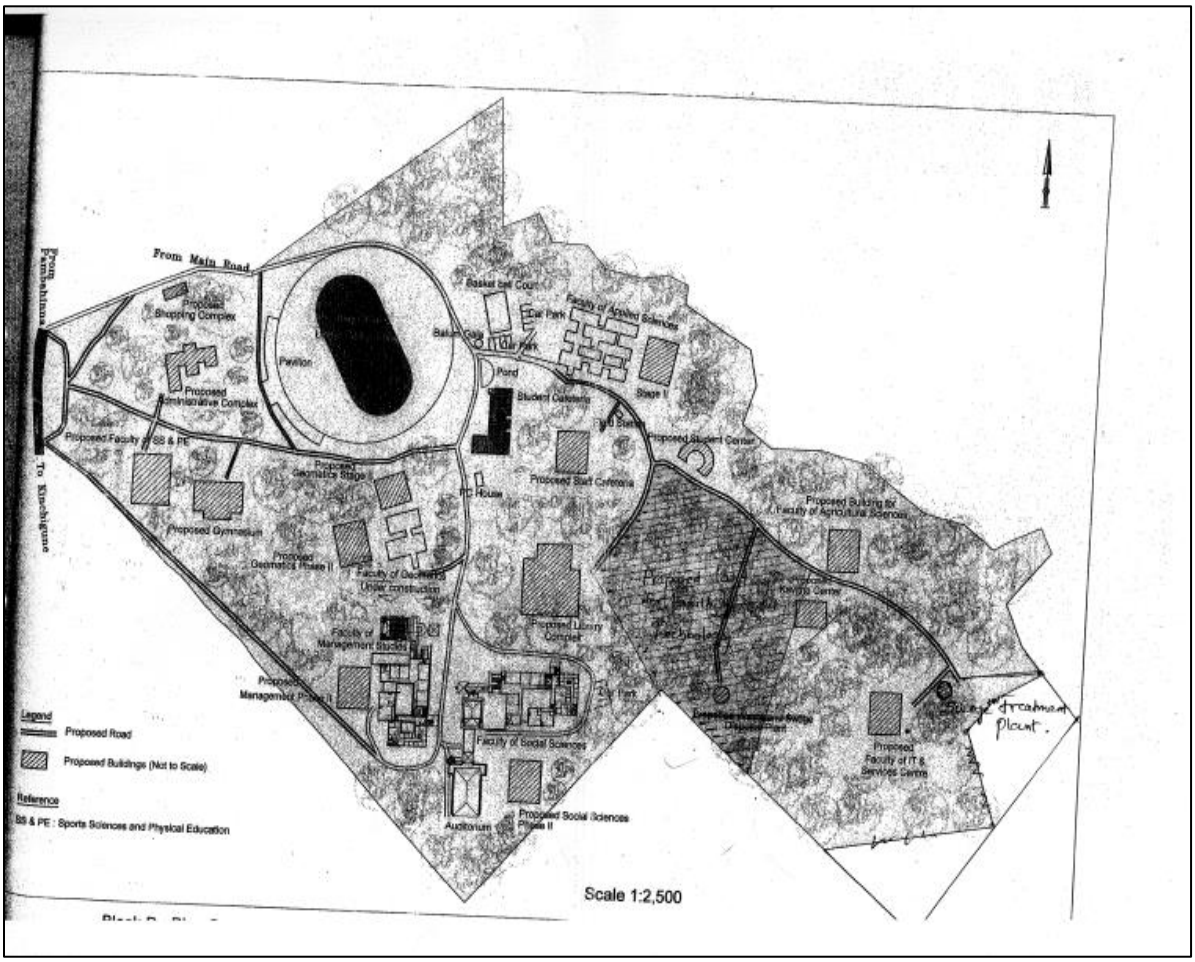
i. Assessment of availability of water for such a facility (since sometimes the university is closed down due to lack of water availability)
The present-day bottleneck of the development of SUSL is limited water supply. As per the recent data in 2015 about the water consumption by the university at present capacity, daily requirement exceeds 300,000 liters, out of which, around 120,000 liters are supplied by ground water wells and the rest is by Hirikatuoya. However, as is the case for 2015, extended dry periods can reduce the supply of Hirikatuoya to less than 30% of its capacity. Resultant severe water shortage is, in part, solved by bringing water from sources elsewhere (i.e. Kalupahana area), which are also thinning out by dry periods. Future expansions of SUSL should therefore be in parallel with the expansion of the water supply.

j. Assessment of uninterrupted power supply: The Ceylon Electricity Board (CEB) has provided a separate power exchange for the University. However, the University experiences frequent power failures and therefore alternative sources of power supply should be thought in view of this future development.

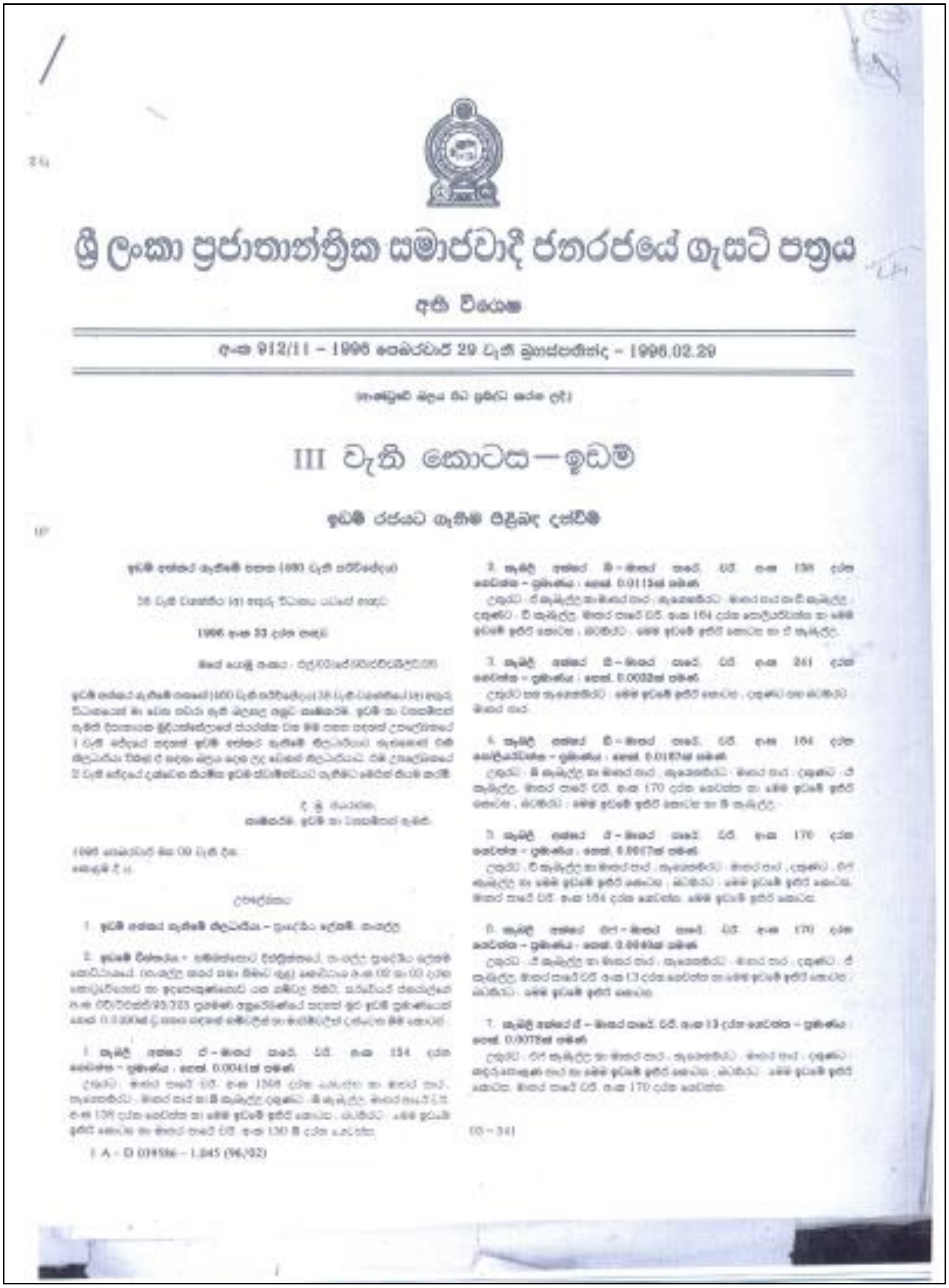
ANNEX 2: SURVEY PLAN



ANNEX 3: MASTER PLAN



ANNEX 4: GAZZETE NOTIFICATION OF THE LAND



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III වැනි කොටස — ඉඩම්

ඉඩම් රජයට ගැනීම පිළිබඳ දැන්වීම

6. ඇමිති අනෙක් "ආර්" – සෙල්ලපල්ලෙකුයටිය – ප්‍රමිණය : හෙක්. 0.0025ක් පමණ.

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7. ඇමිති අනෙක් "ඩී" – සෙල්ලපල්ලෙකුයටිය – ප්‍රමිණය : හෙක්. 0.0210ක් පමණ.

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8. ඇමිති අනෙක් "එම්" – සෙල්ලපල්ලෙකුයටිය – ප්‍රමිණය : හෙක්. 0.0100ක් පමණ.

උතුරට : ඉහත ඉඩමේ ඉතිරි කොටස ; නැගෙනහිරට : පිණ්ඩු ; දකුණට : ඉහත ඉඩමේ ඉතිරි කොටස ; බටහිරට : ඉහත ඉඩමේ ඉතිරි කොටස සහ ඇමිති අනෙක් "ජී".

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ඉඩම් අත්පත් කිරීමේ පනත (මෙහි) 1969 වැනි පරිච්ඡේදය

38 වැනි වගන්තිය (අ) සලද, පිටපතය යටතේ නෙළා

1998 අංක 32 දරන නෙළුව

මිහිත් සෙනෙ පංකාය : එල්.ඩී.සෝ/සී/සී/2004.

ඉඩම් අත්පත් කිරීමේ පනතෙහි (මෙහි) 1969 වැනි පරිච්ඡේදයේ 38 වැනි වගන්තියේ (අ) ඡේදය විධානයෙන් මිහි සඩහා සඩහා ඇති බලතල අනුව සංඛ්‍යාවේ. ඉඩම් හා වාහනවිභාග ඇමිති විධානයෙන් මුදල්ලේඛ්‍යාගේ එකඟතිය ඩිස මහි පනත යටතේ උපලේඛනයේ I වැනි තීරුවේ සඳහන් ඉඩම් අත්පත් කිරීමේ නිලධාරියා ලෙසත්, එම තීරුවේ එදිරිපිහිටා දක්වා ඇති ඉඩම් අත්පත් කිරීමේ නිලධාරියා ලෙසත් එම උපලේඛනයේ II වැනි තීරුවේ උපලේඛන තීරුමිහි ඉඩම් සම්බන්ධයෙන් ඇමතෙන් බලය පවරා තිබෙන බැවින්,

ද් ශ්‍රී ජයන්ත
තණිකරුවිල්, ඉඩම් හා වාහනවිභාග ඇමති.

1998 පෙබරවාරි මස 27 වැනි දින.

පෙළඳලෙය

1. ඉඩම් අත්පත් කළමනා නිලධාරිය – ප්‍රදේශීය ලේකම්, ඉඩම්දාර.

2. ඉඩමේ විස්තරය – පළාත්පල්, පළාත්, ග්‍රාමසේවා වසම්පාලකයා, ඉඩම්දාර ප්‍රාදේශීය ලේකම්කාරයා, සඩහන්වන්තයා, ලුක් කොට්ඨාසයේ ඉඩම්කටයුත්තේ වගකී නිලධාරී, සර්වේයර් ජනරාල්ගේ කාර්යාලයේ නියෝජිත නිලධාරියා සහ ඉහත ඉඩම්වල සිමා දක්වා ඉඩම්කාරයාගේ ඇමිති අත්පත් ඒ නිව් ඒ දක්වා කොල්ලුම් සහ ඉහත ඉඩම්කාරයාගේ කොන්ත්‍රාත් 32 2000ක් යන්න වැනි ඉඩම්කාරයා ඉඩමෙහි ඉඩම් කොටස්වලට බැඳේ.

1. ඇමිති අත්පත් ඒ – බිහිසූනිත ඉඩම්දාර – ප්‍රමිණය : හෙක්. 0.0490ක් පමණ.

උතුරට : ඇමිති අංක 337 ; නැගෙනහිරට : ඇමිති අත්පත් ඒ, දකුණට : ඇමිති අංක 339 ; බටහිරට : මාර්ගය.

2. ඇමිති අත්පත් බී – බිහිසූනිත ඉඩම්දාර – ප්‍රමිණය : හෙක්. 0.0550ක් පමණ.

උතුරට : ඇමිති අංක ඒ 337 හා 338 ; නැගෙනහිරට සහ දකුණට : ඇමිති අත්පත් බී සහ ඒ, බටහිරට : ඇමිති අංක ඒ 337 හා 338.

3. ඇමිති අත්පත් සී – බිහිසූනිත ඉඩම්දාර – ප්‍රමිණය : හෙක්. 0.0480ක් පමණ.

උතුරට : ඇමිති අංක බී 336 හා 373 ; නැගෙනහිරට : ඇමිති අංක 373, 372 සහ ඇමිති අත්පත් ඒ ; දකුණට : ඇමිති අත්පත් බී ; බටහිරට : ඇමිති අත්පත් බී 306 සහ 370.

4. ඇමිති අත්පත් ඩී – බිහිසූනිත ඉඩම්දාර – ප්‍රමිණය : හෙක්. 0.0070ක් පමණ.

උතුරට : ඇමිති අත්පත් ඕ, ඊ සහ ඇමිති අංක 370, ඇමිති අත්පත් ඒ, ඩී සහ එම්, නැගෙනහිරට : ඇමිති අංක 372 ඇමිති අත්පත් ඒ, ඊ සහ එම්, දකුණට : ඇමිති අංක ඒ 368 සහ ඇමිති අත්පත් එම්, බටහිරට : ඇමිති අංක 220, ඇමිති අත්පත් එම් සහ ඩී.

5. ඇමිති අත්පත් ඊ – බිහිසූනිත ඉඩම්දාර – ප්‍රමිණය : හෙක්. 0.4200ක් පමණ.

උතුරට : ඇමිති අත්පත් ඊ සහ ජී, නැගෙනහිරට : ඇමිති අත්පත් ඊ සහ එම්, දකුණට : ඇමිති අත්පත් ජී, එම් සහ ඊ, බටහිරට : ඇමිති ඇමිති අත්පත් ඊ සහ ඒ.

6. ඇමිති අත්පත් එම් – බිහිසූනිත ඉඩම්දාර – ප්‍රමිණය : හෙක්. 0.1810ක් පමණ.

උතුරට : ඇමිති අත්පත් ඊ සහ ජී, නැගෙනහිරට : ඇමිති අත්පත් ජී, දකුණට : ඇමිති අත්පත් ජී සහ ඊ, බටහිරට : ඇමිති අත්පත් ඊ සහ ඒ.

7. ඇමිති අත්පත් ජී – බිහිසූනිත ඉඩම්දාර – ප්‍රමිණය : හෙක්. 33.1000ක් පමණ.

උතුරට : ඇමිති අත්පත් ඊ, එම්, ජී, ඇමිති අංක 372, 362, ඇමිති අත්පත් ඉඩම්, කේ, ඒම්, ඇමිති අංක 373, 51, 73 සහ ඉ.ප.ජ. 372 ; නැගෙනහිරට : ඇමිති අංක 51, 73, ඉ.ප.ජ. 372, 299, 360, 304 සහ 323 ; දකුණට : ඇමිති අංක 360, 304, 322, 321 සහ 320 ; බටහිරට : ඇමිති අංක 322, 321, 320, ඇමිති අත්පත් ඊ, එම් සහ ඇමිති අංක 373.

8. ඇමිති අත්පත් එම් – බිහිසූනිත ඉඩම්දාර – ප්‍රමිණය : හෙක්. 0.1030ක් පමණ.

උතුරට : ඇමිති අංක 370, 368 සහ ඇමිති අත්පත් ඔම් ; නැගෙනහිරට : ඇමිති අත්පත් ඔම් ; දකුණට : ඇමිති අත්පත් ඊ ; බටහිරට : ඇමිති අත්පත් ඊ, ඇමිති අංක 373, 383 සහ 370.

9. ඇමිති අත්පත් ඔම් – බිහිසූනිත ඉඩම්දාර – ප්‍රමිණය : හෙක්. 0.2810ක් පමණ.

උතුරට : ඇමිති අංක 309, 368 සහ ඇමිති අත්පත් ඒම් ; නැගෙනහිරට : ඇමිති අත්පත් ඒම් ; දකුණට : ඇමිති අත්පත් ඒම් සහ ඊ, එම් ; බටහිරට : ඇමිති අත්පත් ඊ, එම්, ඇමිති අංක 370 සහ 368.

10. ඇමිති අත්පත් ඒම් – බිහිසූනිත ඉඩම්දාර – ප්‍රමිණය : හෙක්. 0.4990ක් පමණ.

උතුරට : ඇමිති අංක 309 සහ 373 ; නැගෙනහිරට : ඇමිති අංක 373 සහ ඇමිති අත්පත් ඊ ; දකුණට : ඇමිති අත්පත් ඊ සහ එම් ; බටහිරට : ඇමිති අත්පත් එම්, ඇමිති අංක 368 සහ 366.

11. ඇමිති අත්පත් ඒම් – බිහිසූනිත ඉඩම්දාර – ප්‍රමිණය : හෙක්. 0.3090ක් පමණ.

උතුරට : නැගෙනහිරට, දකුණට සහ බටහිරට : ඇමිති අත්පත් ඊ.

12. ඇමිති අත්පත් ඔම් – බිහිසූනිත ඉඩම්දාර – ප්‍රමිණය : හෙක්. 0.3900ක් පමණ.

උතුරට, නැගෙනහිරට, දකුණට සහ බටහිරට : ඇමිති අත්පත් ඊ.

13. ඇමිති අත්පත් එම් – බිහිසූනිත ඉඩම්දාර – ප්‍රමිණය : හෙක්. 0.4130ක් පමණ.

උතුරට සහ නැගෙනහිරට : ඇමිති අත්පත් එම් ; දකුණට : ඇමිති අත්පත් එම් සහ ඇමිති අංක 363 ; බටහිරට : ඇමිති අංක 363 සහ ඇමිති අත්පත් එම්.

14. ඇමිති අත්පත් එම් – බිහිසූනිත ඉඩම්දාර – ප්‍රමිණය : හෙක්. 0.6084ක් පමණ.

උතුරට : ඇමිති අංක 383, 359, 360 ඇමිති අත්පත් ඕ සහ ඇමිති අංක 31 ; නැගෙනහිරට : ඇමිති අත්පත් ඕ සහ 31 ; දකුණට : ඇමිති අංක 373, 363 සහ 359 ; බටහිරට : ඇමිති අංක 363, ඇමිති අත්පත් එම් සහ ඇමිති අංක 359.

15. ඇමිති අත්පත් ඕ – බිහිසූනිත ඉඩම්දාර – ප්‍රමිණය : හෙක්. 0.1840ක් පමණ.

උතුරට : ඇමිති අංක 360 සහ 31 ; නැගෙනහිරට : ඇමිති අංක 31 ; දකුණට : ඇමිති අංක 31 සහ ඇමිති අත්පත් එම් ; බටහිරට : ඇමිති අත්පත් එම්, ඇමිති අංක 359 සහ 360.

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ANNEX 5: APPLICABLE ENVIRONMENTAL LEGISLATIONS

A. Environmental Impact Assessment

1. Sri Lankan Government recognizes Environmental Impact Assessment as an effective tool for the purpose of integrating environmental considerations with development planning. EIA/IEE considered as a means of ensuring that the likely effects of new development projects on the environment are understood before development is allowed to proceed.

2. The legal provision for EIA in Sri Lanka was first included in the Coast Conservation Act No. 57 of 1981 (see below). The broader legal framework for the EIA process in Sri Lanka was laid down by the amendments made to NEA in 1988 through National Environmental (Amendment) Act No. 56 of 1988. The provision relating to EIA is contained in Part IV C of the National Environmental Act. The procedure stipulated in the Act for the approval of projects provides for the submission of two types of reports Initial Environmental Examination (IEE) report and Environmental Impact Assessment (EIA) report. Such reports are required in respect of "prescribed projects" included in a Schedule in an Order published by the Minister of Environment in terms of section 23 Z of the act in the Gazette Extra Ordinary No. 772/22 dated 24th June 1993. This amendment makes EIA mandatory for whole of Sri Lanka and transformed Central Environment Authority (CEA) into enforcement and implementing agency.

3. Any developmental activity of any description whatsoever proposed to be established within one mile of the boundary of any National Reserve, should receive the prior written approval of the Director of Wildlife Conservation. EIA/IEE will be requires if the project is located near FFPO designated five categories of protected areas.

4. The EIA process is implemented through designated Project Approving Agencies (PAAs). PAA's are those organizations that are directly connected with such a prescribed project. At present, 23 state agencies have been recognized by the Minister as PAA's including Ceylon Tourist Board. A given organization cannot act both as the PAA as well as the project proponent. In such cases the CEA will designate an appropriate PAA. Similarly, when there are more than one PAA the CEA must determine the appropriate PAA. In the event of doubt or difficulty in identifying the appropriate PAA, CEA itself will function as the PAA. At present, there are 31 such PAAs to deal with review and approval of environmental plans
In order for a project to be approved the project proponent should submit either an Initial Environmental Examination (IEE) report or an Environmental Impact Assessment (EIA) report. Once an EIA report has been submitted there is mandatory period of 30 days during which the public can inspect the document and comment on the report. Further, a public hearing may be held to provide an opportunity to any member of the public to voice their concerns. A decision whether to approve the project will be made only after public consultation is done and necessary major issues are resolved.

B. Environmental Protection License

5. The Environmental Protection License (EPL) is a regulatory/legal tool under the provisions of the National Environmental Act. The CEA issues Environmental Protection Licenses (EPL) to medium and high polluting industries under section 23(A) of the NEA. The regulations are gazette under Gazette Extraordinary No. 1533/16 dated January 25,2008, for a variety of sectors involving in manufacturing, construction or services which need to obtain Environment Protection Licenses (EPL) The Environmental License (EPL) procedure for the

control of pollution. Regulations pertaining to this process have been published in 1990 and are available with the CEA. The EPL issued to an industry or development activity and is legally binding and violation of conditions in the license is a punishable offence under the NEA. EPLs are issued by the CEA or a designated body which can be local authorities for low polluting industries, Board of Investment (BOI) for BOI industries. In the North Western Province, where a separate Provincial Environmental Authority exists, the EPLs are issued by the North Western Provincial Environmental Authority (NWPEA).

6. The EPL procedure has been introduced to prevent or minimize the release of discharges and emissions into the environment from industrial activities in compliance with national discharge and emission standards, to provide guidance on pollution control for polluting processes and to encourage the use of pollution abatement technology such as cleaner production, waste minimization etc. Here the industries are classified into three lists named A, B and C. List A comprise of 80 potentially high polluting industries, List B comprise of 33 medium polluting industries and List C comprise of 25 low polluting industrial activities. These projects will come under List B or List C.

7. EPL's for List A and List B industries are issued by the relevant Provincial/ District offices of the CEA while EPL; s for List C industries are issued by the relevant local authority. The EPL issued for List A industries are valid for a period of one year while List B and List C industries are valid for a period of three years, from the effective day of the issue of license.

8. For List A and List B industries the project proponent must submit a duly filled application (can be obtained from CEA headquarters, provincial and district offices or downloaded from www.cea.lk) for each prescribed activity to provincial or district office of CEA who will evaluate the application and determine the relevancy of issuing an EPL and the adequacy of the details furnished and determine and appropriate inspection fee. Then the project proponent must pay the prescribed fee to CEA headquarters, provincial or district office of CEA and submit the receipt to the relevant provincial or district office of the CEA. Then a team of officers will carry out an inspection and submit a report based on the site visit and the information provided. If the Issue of EPL is recommended the project proponent can obtain the EPL upon payment of license fee.

9. For List C industries issue of EPL is delegated to local authorities (Municipal councils, Urban councils or Pradeshiya Sabha). The procedure to be followed is the same except the Local Authority will appoint a Technical Evaluation Committee (TEC) that will make the final decision regarding the issue of EPL based on the field assessment report and information furnished by the industrialist. The EPL can be renewed by submitting a renewal application three month prior to the date of expiry to the relevant authority who will conduct afield inspection and determine whether the EPL should be renewed.

C. Fauna and Flora Protection Ordinance (FFPO) Amended Act No. 49 of 1993

10. EIA provisions are also included in the Fauna and Flora (Amended) Act No. 49 of 1993. According to this Act, any development activity of any description what so ever proposed to be established within one mile from the boundary of any National Reserve, is required to be subjected to EIA/IEE, and written approval should be obtained from the Director General, Department of Wildlife Conservation prior to implementation of such projects. The EIA/IEE process under the FFPO is similar to that described in the NEA.

11. Under the FFPO five categories of protected areas are established viz, Strict nature reserve, National parks, Nature reserve, Jungle Corridors etc. According to the act any development activity of any description what so ever proposed to be established within a national reserve of within one mile of any boundary of any national reserve is required to be subjected to EIA/IEE and written approval should be obtained from the Director general Department of Wild life and Conservation prior to implementation of such projects. The FFPO follows a similar process as the NEA in conducting scoping, setting the TOR, preparation of EA, review of EA, public consultation and disclosure.

D. The Constitution of Sri Lanka (Articles 18, 27(14), Articles 154 (A), 9, 19 and (III) 17)

12. The Constitution of Sri Lanka contains several provisions relating to the environment such as Article 18 (“It is the duty of every person of Sri Lanka to protect nature and conserve its riches”) and Article 27 (14) (” The state shall protect, preserve and improve the environment for the benefit of the community”). The 13th Amendment to the Constitution created new institution at the provincial level for environmental protection and management. Each provincial government under this Amendment has legislative and executive powers over environmental matters (Articles 154 (A), 9, 19 and (III) 17). Using such provincial legislative and executive powers, the North Western Provincial Council adopted the North Western Provincial Environmental Authority to supervise and monitor environmental activities in the North Western Province of Sri Lanka.

E. Pradeshiya Sabha Act No. 15 of 1987

13. Section 12 (2) of the Pradeshiya Sabha Act authorizes the appointment of a committee at the divisional level to advice on environmental matters. Section 105 of the Act prohibits polluting water or any streams, while Section 106 refers to pollution caused by industry and related offences. The Pradeshiya Sabha grants permission for construction activities within its jurisdiction. Such construction will have to comply with environmental requirements stipulated with permits. It also ensures that public health issues are efficiently dealt with and solid waste collection and disposal are appropriately done under this Act.

F. Flood Protection Ordinance, Act No. 22 of 1955

14. This ordinance provides necessary provisions to acquire land or buildings or part of any land or building for the purpose of flood protection.

G. Irrigation (Amendment) Act (No. 48 of 1968)

15. Part VI section 75 is mentioning about the Liability where irrigation work is damaged, or water is used without authority or is wasted by a person who cannot be identified.

> (1) Where water from any ela, channel, watercourse or other irrigation work is obtained in any manner not authorized or is allowed to run to waste, and the person who obtained such water or allowed such water to run to waste cannot be identified, then, if any land has derived any benefit from such water, the proprietor of such land shall be liable to pay for such water at such rate as the Government Agent may determine.
>
> (2) Where any act is committed whereby damage is caused to any irrigation work and the person who committed such act cannot be identified, then, if any land has derived any

benefit as a result of the commission of such act, the proprietor of such land shall be liable to pay to the Government Agent the expenses incurred in repairing such damage.

(3) If default is made in the payment of any sum due under this section, such sum shall be recoverable in the manner provided in Part VII.

H. State Land Ordinance, Act No. 13 of 1949

16. The State Land Ordinance provides guidelines for:

(i) The protection of natural water springs, reservoirs, lakes, ponds, lagoons, creeks, canals, and aqueducts.
(ii) The protection of the source, course and bed of public streams.
(iii) The construction or protection of roads, paths, railways, and other means of internal communication systems.
(iv) The prevention of soil erosion.
(v) The preservation of water supply sources.

17. Section 75 of the Ordinance highlights riparian proprietors' rights and duties. The occupier of land on the banks of any public lake or public stream has the right to use water in that water body for domestic purpose, but cannot diverted water through a channel, drain or pipe or by any other mechanical device.

I. Soil Conservation Act, No. 25 of 1951

18. The Soil Conservation Act provides for the conservation of soil resources, prevention or mitigation of soil erosion, and for the protection of land against damage by floods and droughts. Under the Act, it is possible to declare any area defined as an erodible area and prohibit any physical construction. The following activities are also prohibited under Act:

(i) weeding of land or other agricultural practices that cause soil erosion;
(ii) use of land for agriculture purposes within water sources and banks of streams; and
(iii) Exploitation of forests and grassland resources and setting fire in restricted areas.

J. Sri Lanka Land Reclamation and Development Corporation Act No 15 of 1968

19. The act provides for the establishment of Sri Lanka Land Reclamation and Development Corporation for the development and reclamation of land according to the National policy relating to land Reclamation and Development. It has powers to prohibit the reclamation of development areas. Has powers to declare a wetland to a low line area if it is identified as significant in terms of ecology or environmentally. As per the recent amendment to the act, by act no. 35 of 2006 the corporation will be empowered to take legal action against unauthorized reclamation activities and pollution of inland water bodies as well.

K. Mines and Minerals Act No. 33 of 1992

20. Under this Act, mining falls within the purview of the Geological Survey and Mines Bureau (GSMB). Mining of minerals including sand must be done with a license issued by the GSMB. Mining is not permitted within archaeological reserves or within specified distances from such monuments. New mining licenses are subject to the EIA process, if the type and extent of mining

is listed under the EIA regulations. Additionally, GSMB has the power to stipulate conditions including cash deposits and insurance policy for the protection of environment. Regulations made by GSMB under the Act cover a variety of environmental stipulations, criteria and conditions for licensing and operating mines. This also covers the disposal of mine wastes. The Act also deals with the health, safety and welfare of miners. Mining rights on public and private land are subject to licensing by GSMB, and all minerals wherever situated belonging to the State. The right to mine public land parcels are subjected to the EA procedures.

L. Forest Ordinance, No 17 of 1907 (and amendments)

21. The Forest Ordinance of Sri Lanka is the law for conservation, protection and management of forest and forest resources. It regulates tree felling, transport of timber, and other forest related matters. The Forest Ordinance was amended by several Acts - Act 34 of 1951, No. 49 of 1954, Act 13 of 1966, Act 56 of 1979, Act 13 of 1982, and Act 84 of 1988. The Act 23 of 1995 replaced the old Ordinance. Under Section 4 of Act 23 of 1995, the Minister who is in charge of forests can declare any specified area of government land or the whole or any specified part of any reserve forest which has unique ecosystems, genetic resources or a habitat or rare and endemic species of flora, fauna, and microorganisms and of threatened species which need to be preserved in order to achieve an ecological balance in the area by preventing landslides and fire hazards. Under Section 5 of the Act, a Forest Officer has powers to stop any public or private watercourse which goes through a reserved forest. It shall be lawful for the District Secretary to determine the amount of compensation to be paid in case that the water course adversely affects the interests or one or more individuals.

22. Under Section 6 of the Act, the following activities are prohibited:

(i) trespassing or permits cattle to trespass;
(ii) damage by negligence in felling any tree, cutting or dragging any timber;
(iii) willfully strips off the bark or leaves from, or girdles, lop, taps, burns or otherwise damages any trees;
(iv) poisons water;
(v) mine stone, burns lime or charcoal, or collects any forest produce; and
(vi) extracts coral or shells or digs or mines for gems or other minerals

M. National Water Supply and Drainage Board Law of No. 2 of 1974

23. The National Water Supply and Drainage Board (NWSDB) is the principle water supply and sanitation agency in Sri Lanka. It was established in January 1975 under the Law No. 2 of 1974. NWSDB develops, provides, operates and controls water supply and distributes water for public, domestic and industrial purpose.

N. Department of Agrarian Services act No46 of 2000

24. Department of Agrarian Services started on 01st of October 1957 with an idea of providing supply services that are initial for Agriculture schemes. In section 83 it mentioning the if the blocked up, obstructed or encroached upon or caused to be blocked up, obstructed or encroached upon, damaged or caused to be damaged, any irrigation channel, water course, bund, bank, reservation tank, dam, tank-reach or irrigation reserve make an order requiring such person to take such remedial measures as arc specified in the order by the commissioner.
In section 84nit mentioning the No person shall release, cause to be released, or allow the flow of, waste matter into any channel, canal, water course, irrigation reservation or paddy land. And

in section 85 it mentioning that the No person shall dump any waste matter into any channel, canal, watercourse, irrigation reservation or paddy land.

O. National Policy for Rural Water Supply and Sanitation of 2001

25. The National Policy for Rural Water Supply and Sanitation, approved by the cabinet in 2001, has laid down a framework for water supply and sanitation services to the rural sector, which is defined as any Grama Niladhari Division within a Pradeshiya Sabha area except for those in former town council areas. It provides guidelines on the delivery of minimum water requirements to ensure health, and on levels of service in terms of quantity of water, haulage distance, adequacy of the source, equity, quality, flexibility for upgrade, and acceptable safe water supply systems.

26. The Policy prescribes ventilated, improved pit latrines as basic sanitation facilities and defines other acceptable options that include piped sewer with treatment, septic tanks with soakage pits, and water-sealed latrines with disposable pits. For rural water supply and sanitation, the Policy defines the roles and responsibilities of the government, provincial councils, local authorities, community-based organizations (CBO), non-governmental organizations (NGOs), private sector, and international donors. It also sets the scope of regulations for which the provincial councils and local authorities can enact statutes and by–laws.

P. Prevention of Mosquito Breeding, Act No. 11 of 2007

27. This Act was enacted to prevent and eradicate mosquito-borne diseases such as dengue. Under this Act, it shall be the duty of every owner or occupier of any premises to remove and destroy open tins, bottles, boxes, coconut shells, split coconuts, used tires, or any other article or receptacle found in such premises, and to maintain water wells in such premises to prevent breeding of mosquitoes. People are also bound to empty any artificial pond or pools at least once in a week. Shrubs, undergrowth and all other types of vegetation other than ornamental vegetation and food plants are to be removed.

Q. The Urban Development Authority, Law, No 41 of 1978

28. The Urban Development Authority (UDA) promotes integrated planning and implementation of social, economic and physical development of areas which are declared as urban development areas under the UDA Act. UDA provides technical support to local councils who require assistance in developing plans. It has the authority to develop plans when local authorities fail to do. The UDA monitors urban areas, including 1 km. inland from the coasts in all areas of the coastal zone, and develops land use policies for designated development areas.

R. Municipal Council Ordinances and Acts – Urban Council Ordinance 61 of 1939, Act 29 of 1947, Act 18 of 1979, and Act 13 of 1979

29. The Municipal Councils and Urban Councils share with Pradeshiya Sabhas powers regarding the approval of buildings plans, control of solid waste disposal, sewerage and other public utilities. Under these laws, new constructions and modifications to current buildings require approval of Municipal or Urban Council or Pradeshiya Sabha. Municipal and Urban councils follow planning and building guidelines of UDA.

30. The Environmental Policy, NEA and its amendments, and several other pieces of legislation relevant to SSEP outlined above show that environmental policies and the legal or

regulatory framework is comprehensive and adequate to address and manage potential environmental impacts and risks associated with its refurbishment and construction activities.

S. Land Acquisition Act No. 09 in 1950 and subsequent amendments in 1983 1nd 1986

31. Land Acquisition act No 9 of 1950 provides a detailed procedure for acquiring land and sets out a process with inbuilt safeguards. The Act makes provision for the acquisition of land for public purpose. The actual public purpose can result from development programs initiated by various government Departments and agencies from a multitude of sectors. Under the Act land could be acquired either through a normal procedure or expedited process. In terms of regular process there is provision for the calling of objections from the public prior to proceeding with the acquisition. Land Acquisition Act provides limited grievance mechanism. The Act provides compensation based on market value. It also provides a mechanism through which objections to an acquisition of land can be made. A limited grievance mechanism is available relating to the quantum of compensation to be received.

T. Land Acquisition Regulations, 2008

32. These regulations may be cited as the Land Acquisition Regulations, 2008.The basis of assessing the market value of any land or the compensation for any injurious affection caused by the acquisition of any land under this Act.

33. These Regulations establish the basis for assessing the market value of any land or the compensation for any injurious affection caused by the acquisition of land. Market Value should be assessed as follows: in case part of a land is acquired and when its value as a separate entity deems to realize a value proportionately lower than the Market Value of the main land the compensation should be proportionate to the value of the main land. When the date of intention to acquire was published, the building is used or is intended to be used for occupation and or business purposes, the difference between the cost of re-construction and the value of building, based for determination of Market Value under Section 1.1, should be paid as an additional compensation. Value based on development potential could be considered for paddy lands acquired where permission to fill such lands have been granted by the Agrarian Services Commissioner General. When an acquired building is occupied by a tenant/statutory tenant protected under the provisions of the Rent Act, No. 7 of 1972 (as amended thereafter) the compensation should be ascertained in proportion having regard to the provisions of Rent (Amendment) Act, No. 26 of 2006.

U. Ceylon Electricity Board Act (No. l7of L969)

34. An Act to provide for the establishment of an electricity board for the development and co-ordination of the generation, supply and distribution of electrical energy; for the transfer to such board of the government electrical undertakings, and, in certain circumstances, of the electrical undertakings of local authorities; for the employment by the board of employees of the department of government electrical undertakings; for the entering into joint schemes by such board with any government department or approved body for the generation of electrical energy, the irrigation of lands, the control of floods or other like objects; and to make provision for all matters.

35. There are five parts in the act as follows:

Part 1: - Constitution, Powers and Duties of the Ceylon Electricity Board

Part 2: - Transfer to the Board of the Government Electrical Undertakings
Part 3: - Staff of the Board
Part 4: - Finance, Auditing and Annual Report

ANNEX 6: GREEN BUILDING APPLICATION

කාර්යාලීය ප්‍රයෝජනය සඳහා
ලියාපදිංචි අංකය :
ගොනු අංකය :
දිනය :

නාගරික සංවර්ධන අධිකාරිය

හරිත ගොඩනැගිලි සඳහා අයදුම්පත්‍රය

සභාපති
නාගරික සංවර්ධන අධිකාරිය.

01. **ඉල්ලුම්කරුගේ තොරතුරු :-**

ඉදිකිරීමට යෝජිත ගොඩනැගිල්ල අයත් ආයතනය :..

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ලිපිනය:..

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ANNEX 7: BIQ

Central Environmental Authority

BASICINFORMATIONQUESTIONNAIRE

Essential information to determine the environmental approval requirement of projects

(Note: Use separate esheets as and when required)

1. BACKGROUND INFORMATION

1.1. Project Title: Proposed building for Faculty of Technology Sabaragamuwa University of Sri Lanka

1.2. Name of the Project Proponent: Sabaragamuwa University of Sri Lanka (Company/Firm/Individual)

1.3. Details of the Project Proponent: Faculty of Technology Dr Ampitiyawaththa & Dr Kawinga Koswatte

Postal Address: Sabaragamuwa University of Sri Lanka, P.O. Box 02, Belihuloya, Sri Lanka
Phone No: 0452280087, 04452280014, 0452280178
Fax No:
E-mail Address:

1.4. Details of the Contact Person:

Name: Dr A. Ampitiyawaththa
Designation: Dean of the Faculty of Technology
Phone No: 0715346990
Fax No:
E-mail Address: ampitiyawaththa@gmail.com

2. PROJECT LOCATION DETAILS

2.1. Location of the project:

Province/s: Sabaragamuwa Province

District/s: Rathnapura District

Divisional Secretariat Division/s: Imbulpe

Local Authority/s: Imbulpe Pradeshiya Saba

(***Provide location in1:50,000scale Toposheet)***

2.2. Physical scale or the extent of the project site (in ha): 2.4281138534ha
(*Provide Survey plan*)

2.3. Does the project wholly or partly fall within any area specified below?

Area	Yes	No	Remarks
100m from the boundaries of or within any area declared under the National Heritage Wilderness Act No.4 of 1988		✓	
100m from the boundaries of or within any area declared under the Forest Ordinance (Chapter451)	✓		
Coastal Zone as defined in the Coast Conservation Act. No.57 of1981		✓	
Any erodible area declared under the Soil Conservation Act (Chapter450)		✓	
Any flood area declared under the Flood Protection Ordinance (Chapter449)		✓	
Any flood protection area declared under the Sri Lanka Land Reclamation and Development Corporation Act No.15 of 1968 as amended by Act No.52 0f1982		✓	
60meters from the bank of a public stream as defined in the Crown Lands Ordinance (Chapter 454) and having width of more than 25 meters at any point of its course.		✓	
Any reservation beyond the full supply level of a reservoir.		✓	
Any archaeological reserve, ancient or protected monuments as defined or declared under the Antiques Ordinance (Chapter188)		✓	
Any area declared under the Botanic Gardens Ordinance (Chapter446)	✓		
Within 100meters from the boundaries of or within, any area declared as a Sanctuary under the Fauna and Flora Protection Ordinance (Chapter469)	✓		
Within 100meters from the high flood level contour of or within a public lake as defined in the Crowns Lands Ordinance (Chapter 454) including those declared under section 71 of the said Ordinance		✓	
Within a distance of one mile of the boundary of a National Reserve declared under the Fauna and Flora Protection Ordinance		✓	

2.4. Present ownership of the project site:

State	Private	Other (Specify)
✓		

(If state owned, please submit a letter of consent of the release of land from the state agency)

2.5 Present land use type of the project site (approximate % of the total project site):

Land use type	**%**	**Land use type**	**%**
Marsh/mangrove		Bare land	
Water bodies	3.12	Paddy	19
Dense forest	33	Tea	68
Sparse forest		Rubber	0.54
Scrub forest	49	Coconut	
Grass land	80	Built-up area	
Home gardens	7	Any other (Specify)	

3. PROJECT DETAILS

3.1. Objective/s of the project:

This project aims to increase the engineering-oriented work force which will contribute to transform Sri Lankans growing economy. Under this Project the Sabaragamuwa University of Sri Lanka (SUSL) will build a new Faculty of Technology (FT) within the University Establishment of the FT with training on subjects such as Bio Systems Technology and Engineering Technology. will improve the job security for these graduates in the local as well as global job market. Graduates from University of SUSL Faculty of Technology will have a competitive edge to secure jobs in the future. It will be geared to fill job in industries such as Biotechnology, biopharmaceuticals, agrochemical, ecosystem protection, aquatic resource management, bio machinery, alternative energy enterprises, automobile & mechanical engineering, technical experts, apparel, manufacturing, energy and constructions. This will ensure that these graduates will have a competitive edge to secure jobs both locally and internationally.

3.2. Present stage of the project in the project cycle:

(i)	Pre-feasibility	✓
(ii)	Feasibility	Done
(iii)	Design	Completed
(iv)	Other (specify)	Not yet

3.3. Type of the project (Please tick the relevant cage/s):

Land development/clearing	✓	Hotels /Recreational Facilities	
Timber extraction/tree felling	✓	Housing and building	
Reclamation of Land/wetland		Resettlement	
Conversion of forests into non-forest uses	✓	Laying of gas and liquid (excluding water) transferring pipe lines	
Urban development	✓	Mining	
Portand Harbour Development		Tunneling	

Transportation system		Fisheries and aquaculture	
River basin development/Irrigation		Disposal of solid/liquid/hazardous wastes	✓
Power generation and transmission		Salterns	
Surface/ground water extraction		Any other (Specify)	
Industry/Industrial Estates and Parks			

3.4. Physical scale or the magnitude of the project:

The extent of the building is:

Indicative requirements for Buildings (Technology Faculty)- Phase 1			
Spaces	**Seating Capacity**	**Floor Area in Sq. F**	**Number of Rooms**
Class rooms	100	2000	4
Computer laboratory	100	3000	1
Chemistry lab (100 students)	100	3400	1
Physics lab	100	3120	1
Biology lab	100	4650	1
Staff rooms	1	120	24
Departments	4	700	2
Dean office	6	2460	1
Reading room	50	1200	2
Student common room	50	800	1
Auditorium	200	5000	1
Computer admin office		200	1
Staff common/dining room	650	650	1
UI Collaboration center	25	1850	1
Library	50	3230	1
Exam halls	100	4000	2
Cafeteria	50	3230	1
Security office	10	1000	1
Other (25%)			
TOTAL AREA		**40610**	
Car park	**30**	**225**	**30**
Indicative requirements for Buildings (Technology Faculty)- Phase 2			
Spaces	**Seating Capacity**	**Floor Area in Sq. F**	**Number of Rooms**

Class rooms	100	2,000	4
Mechanical Lab	40	5,000	1
Electrical Lab	25	2,500	1
Automobile Lab	25	2,500	1
Biotechnology Lab	50	2,600	1
Pharmacology Lab	25	2,150	1
Bioenergy Lab	25	2,500	
Microbiology Lab	50	2,600	1
Workshop	25	2,000	1
Staff rooms	1	120	30
Staff rooms with attached washrooms	1	150	10
Reading room	50	1,000	1
Conference and Journal office	100	2,692	1
Generator house		600	1
Commercialization center	15	2,000	1
Other (25%)			
TOTAL AREA		**30,412**	
Indicative requirements for Buildings (Technology Faculty)- Phase 3			
Spaces	**Seating Capacity**	**Floor Area in Sq. F**	**Number of Rooms**
Nano Tech Research Center	25	2,475	1
Robotics Research Center	40	1,600	1
Measurement Research Center	25	1,950	1
Food Technology Research Center	50	2,600	1
Pharmaceuticals Research Center	25	2,850	1
Energy Lab	25	2,500	1
		500	6
		120	6
		1,930	1
Class rooms	25	5,000	1
Staff rooms	1	6,000	
Reading room	50	**27,525**	

Total Area during phase I and II - 71,022 sq ft[16]

3.5. Major components of the project:

The proposed FT Development project will involve construction of a new faculty with facilities to conduct lectures for Technology students. The FT will be with several storied buildings and will be constructed in two phases. It will include laboratory facilities for Bio pharmacology and pharmaceutical production technology, bioenergy and alternative energy, food processing, bio technology and micro biology, bio fiber processing, fundamental studies, engineering workshops, physics, mechanical engineering, automobile engineering and electrical engineering. It will also include xxx computer labs that will train xxx students at a time

3.6. Project layout plan (Conceptual):

3.7. Project process/s in terms of:

Inputs including resources such as raw materials, water, and energy used in construction/operational phases of the project and source of such resources

Outputs (including products and by-products)

Major types of equipment/technology to be used

Please contact contractor of the project & detailed design engineers and the PIU for details and fill in

3.8. Does the project involve any of the following activities other than the major project activities?

	Activity	**Yes**	**No**	**If yes please quantify**
(i)	Reclamation of land/wetland		✓	
(ii)	Conversion of forests into non-forest uses	✓		
(iii)	Clearing of lands	✓		
(iv)	Extraction of timber	✓		
(v)	Mining and mineral extraction		✓	
(vi)	Lying of pipelines	✓		
(vii)	Tunneling		✓	
(viii)	Power generation & transmission		✓	

[16] SUSL del

(ix)	Resettlement		✓	
(x)	Extraction of surface/groundwater	✓		
(xi)	Disposal of wastes(solid/liquid/hazardous)	✓		

3.9. Amount of capital investment: The estimated cost is USD 2,572,656 for the. whole project which will be funded by ADB. There is no government contribution for the project

Foreign: (ADB loan)	
Local:	
Phase 1	
Phase 11	

3.10. Proposed timing and schedule including phased development: need to develop by the PIU

3.11. Details of availability of following services/infrastructure facilities:

(i) Roads/access (Specify): Colombo – Batticaloa Hwy
(ii) Water (Specify): liters per day
(iii) Power (Specify): CEB grid and generator
(iv) Telecommunication(Specify): Sri Lanka Telecom
(v) Common waste water treatment facilities (To be filled by SUSL):
(vi) Common solid waste management facilities (Specify):
(vii) Any other (Specify):

3.12. Will the development result in displacement of people or property: (Quantify)? yes

3.13. Will the development result in change of way of life of local people? Yes. Project associated community could provide lodging and other services such as catering for students and provision of telecommunication facilities and photocopying.

3.14. Will the project have plans for future expansion with/without land/space: demands?

Yes. The land would be fully utilized for development during the three phases of construction of FT.

3.15. Information on likely impacts of the project (Please tick the relevant cage/s):

Impact/s	Yes	No	Short term	Medium term	Long term
● Impacts on people & human health	✓		✓		
● Impacts on fauna/flora/sensitive habitats	✓		✓		
● Impacts on soils and land use	✓		✓		

● Impacts on water quality (surface and ground)	✓			✓	✓
● Impacts on drainage/hydrology	✓			✓	✓
● Impacts on air quality	✓		✓	✓	
● Generation of excessive noise and vibration	✓		✓	✓	
● Impacts on landscape/visual environment	✓				✓
● Impacts on historical and cultural resources		✓	-		
● Presence and aggravation of hazards		✓	-		
● Any other (Specify)					

3.16. Information and measures being considered to mitigate likely impacts of the project cited under: with the supervision of the consultant appointed for this project-Building department. EMP provides the mitigation that will be adopted (Refer volume III of the IEE)

3.17. Relationship with other existing /planned: developments:

The FT graduates will be able to gain industrial training in Hambanthota development projects. FT is located in close proximity Colombo - Batticaloa High Level Road and the Pambahinna – Kubalgama – Rajawaka - Kapugala Road.

3.18. Details of any other permits required for the project:

- Environment Clearance CEA
- Solid waste disposal approval without the open dumping practice
- Clarence for waste water treatment plant and sludge removal from the septic tanks–
- Consent from relevant government agencies –Imbulpe Pradeshiya Saba, and Development approval on the design plans
- Green building certificate- UDA

4. OTHER

Provide any other information that may be relevant

I…… certify that the information provided above is true and correct to the best of my knowledge. I am aware that this information will be utilized indecision making.

Name: .....Designation: .....

Signature: ..... Date: .....

For Office Only

1. Date of receipt of the application:
2. Payment of EIA administration fee: Date of payment:
   Amount: Receipt No: Code No:
3. Site inspection information: Date of inspection:

   Name/s of the officers:
   Special comments regarding significant environmental concerns (based on the site inspection:

4. Required approval under Part IVC of NEA:

Yes	No

5. If need to go through the EIA process appropriate PAA:

6. Other remarks:

ANNEX 8: SOIL REPORT

1. INTRODUCTION

Sabaragamuwa University of Sri Lanka intends to construct a new building for the Faculty of Technology (Phase I) at the University premises in Belihuloya. Hence, the Vice Chancellor of the Sabaragamuwa University requested National Building Research Organization (NBRO) to submit a quotation for carrying out soil investigation for the same by his letter dated 15th May 2017 in order to assess the suitability of the selected site location for construction in terms of bearing capacity of soil and stability of slope.

In response to the request, Geotechnical Engineering Division of NBRO submitted an initial cost estimate on 21st July 2017 for the same.

Upon acceptance of the quotation and releasing of advance payment by the client, field investigations were commenced on 09th December 2017.

The suggestions and recommendations given in this report are based on site reconnaissance, field investigations, laboratory testing and analysis.

2. OBJECTIVES

The objective of the geotechnical investigation is to provide information on subsurface conditions of the site to confirm the suitability of selected location for construction works determining bearing capacity of the sub-soil for construction and with respect to safety of land.

3. SCOPE OF WORK

In order to achieve the above objective/s, the following scope of work was adopted:

- Advance two boreholes using rotary core drilling technique.
- Conduct Standard Penetration Tests (SPT) at 1.0 m depth intervals and collection of disturbed soil samples down to rock level.
- Conduct laboratory tests to determine soil physical and mechanical properties.
- Determining parameters required to calculate the bearing capacity.
- Assessment on stability of the slope and preparation of report with recommendations.

4. PROPOSED STRUCTURE

According to the information provided by the client, it is proposed to construct four storied buildings for Faculty of Technology, **Phase I**. Structural details such as service column loads and column spacing were not available at the time of preparation of this report.

The site plans in each site with the borehole locations is presented as **Figure I** in **Appendix I.**

5. GENERAL SITE DESCRIPTION

The land for the proposed building is located within the Sabaragamuwa University premises, and it has been planned to construct at the South - East Direction to the existing building complex of the Faculty of Applied Sciences (Figure 5.1). The site is accessible through the Pambahinna-Kumbalgama road, proceeding about 1 km from the Pambahinna Junction.

It is observed that the proposed land area is located on a small ridge with slope varies from 10 to 25 degrees. During the time of investigation the proposed land is fully occupied by natural vegetation.

Figure 5.1 Site for the proposed building

6. FIELDINVESTIGATIONS

6.1. Codes and Standards

All field and laboratory tests were carried out in accordance with the following specifications.

BS 5930	British Standard for Site Investigation (2015)
BS 1377	British Standard for Field & Laboratory testing

6.2. Level of Supervision

The fieldwork for the soil investigation was carried out under the overview of project engineer and technical officer of NBRO who is responsible for nominating and directing all sampling and providing field logs of the soil profiles encountered.

6.3. Drilling

The objective of the drilling was to obtain geo-technical information and to grasp the sub-soil conditions. Two (02) numbers of boreholes were drilled using core drilling technique at the locations shown in **Figure I** in **Appendix I**. Core drilling technique was adopted to advance all the boreholes and Bentonite slurry was used to eliminate the collapsing of walls of the boreholes.

Details of boreholes advanced at the site are summarised in **Table 6.1.** The logs of boreholes are attached in **Appendix II**.

Table 6.1: Summary of borehole investigation for Faculty of Technology, Phase I

Description	Borehole No.	
	BH 01	BH 02
Date of commenced of Drilling	10/12/2017	19/12/2017
Date of completed of Drilling	17/12/2017	05/01/2018
Depth of Termination (m)	28.55 m	27.65 m
Depth of ground water level (m)	-	-
Thickness of drilling through overburden (m)	28.55 m	27.05 m
Thickness of drilling through rock (m)	-	0.60 m

6.4. Standard Penetration Tests

Standard Penetration Tests (SPTs) were conducted within the boreholes at every 1.0 m depth intervals. Log of the borehole along with the explanation sheets describing the terms and symbols used and the graphical representation of SPT values is presented in **Appendix II.**

For the purpose of preparing the log of borehole, compactness/consistency was classified according to the following **Table 6.2 & Table 6.3.**

Table 6.2: Cohesion less soil

Compactness	SPT No.
Very loose	0 - 4
Loose	4 - 10
Medium dense	10 - 30
Dense	30 - 50
Very dense	>50

Table 6.3: Cohesive soil

Consistency	SPT No.
Very soft	0 - 2
Soft	2 - 4
Firm	4 - 8
Stiff	8 - 15
Very Stiff	15 - 30
Hard	>30

6.5. Soil Sampling and Classification

Disturbed soil samples were collected at every 1.0 m depth intervals in borehole by using the split spoon sampler having a sharp cutting edge at its lowered end is forced into the ground by dynamic impact. Visual classification of the soils was done in the field in accordance with British Standard by NBRO personals.

6.6. Ground Water Table

Ground water table of the borehole was observed during the period of field investigation. Then, depth of water table was measured from the ground surface and recorded in all borehole logs in **Appendix II**. The level of water table was measured daily and recorded before boring to be continued next day morning.

6.7. Soil Profile

Logs of the boreholes along with the explanation sheets describing the terms and symbols used are given in **Appendix II**. The borehole logs also include the SPT results from the field. The vertical subsoil profiles through boreholes are given on **Figure II** in **Appendix I.**

7. ENGINEERING APPRECIATION OF SUB SOIL CONDITIONS

7.1. Condition of Subsurface

The layers in the subsurface may be identified as given below. The thickness of different layers at the borehole locations are given in **Table 7.1**.

Layer 1 - Loose to medium dense sandy SILT/SILT (Top Soil)
Layer 2a - Dense to very dense silty SAND/ sandy SILT
Layer 2b - Washing sample
Layer 3a - Medium dense to vey dense silty SAND/ sandy SILT (Completely Weathered Rock)
Layer 3b - Highly weathered insitu boulder
Layer 4 - Weak GARNET BIOTITE GNEISS

Table7.1: Thickness of the different layers at the borehole locations and the observed SPT

BH 01				BH 02			
From	To	N_{avg}	Layer	From	To	N_{avg}	Layer
0.00	5.80	12	Layer 1	0.00	5.60	16	Layer 1
5.80	6.70	41	Layer 2a	5.60	7.00	50	Layer 2a
6.70	7.45	40	Layer 3a	7.00	7.70	-	Layer 2b
7.45	8.35	-	Layer 3b	7.70	10.30	43	Layer 3a
8.35	28.55	40	Layer 3a	10.30	13.75	-	Layer 2b
Borehole terminated at depth of 28.55 m				13.75	16.20	43	Layer 3a
				16.20	20.80	-	Layer 2b
				20.80	27.05	43	Layer 3a
				Borehole terminated at depth of 27.05 m			

The assumed vertical subsurface profiles through boreholes were drawn and are shown in **Figure II** in **Appendix I**.

7.2. Condition of the Bedrock

Bedrock was cored at locations of BH 01 the reported Core Recovery (CR) and Rock Quality Designation (RQD) of the rock are given in **Table 7.2**.

Table 7.2: Quality of the bedrock

Depth (m)		CR	RQD	Layer
From	To	(%)	(%)	
27.05	27.65	18	Nill	Layer 4

8. INTERPRETATIONS OF THE RESULTS OF THE SITE INVESTIGATION

8.1. Soil Strength and Compressibility Parameters

The energy method of SPT correction (Bowles, 1996) was used to estimate the soil strength parameters of the soil layers. The energy method of SPT correction uses the following relationship to determine the N'_{70} from the field SPT blow counts (N_{Field}):

$$N'_{70} = N_{Field} C_N \eta_1 \eta_2 \eta_3 \eta_4$$

Where

$$C_N = \sqrt{\frac{95.76}{P'_o}} \quad \eta_1 = \frac{E_r}{70}$$

P'_o = Effective overburden pressure at the test level

E_r = Efficiency of the hammer used (taken as 55%)

η_{ii} = Modification factors (Bowles, 1996)

The estimated N'_{70} together with the particle size can be used to estimate the soil strength parameters at respective depths. The estimated soil strength parameters are drained (with drainage) parameters for sand and undrained (without drainage) parameters for clay. **Table 8.1, Table 8.2 & Table 8.3** give the estimated soil strength parameters from the SPT as outlined above with the corresponding observed soil types present at the SPT locations.

Table 8.1: Soil strength parameters with the depth at the locations of the borehole

Depth (m)	BH 01						BH 02					
	Corrected N'_{70}	Drained		Undrained	Soil type	State	Corrected N'_{70}	Drained		Undrained	Soil type	State
		ϕ' (deg)	c' (kPa)	c_u (kPa)				ϕ' (deg)	c' (kPa)	c_u (kPa)		
0.30	20	36			MS	Loose	20	36			MS	Loose
1.30	12	33			MS	Loose	15	34			MS	M.dense

2.30	9	31			MS	Loose	13	33			MS	M.dense
3.30	5	29			MH	Loose	10	32			MS	M.dense
4.30	13	33			MS	M.dense	20	36			MS	M.dense
5.30	17	35			MS	M.dense	18	35			MS	M.dense
6.30	29	39			MS	Dense	35	40			SM	V.dense
7.30	32	39			SM	V.dense						
8.30	-	-				-	30	39			SM	V.dense
9.30	21	36			MS	Dense	30	39			SM	V.dense
10.30	11	32			MS	M.dense	29	39			SM	V.dense
11.30	14	34			MS	M.dense						
12.30	12	33			MS	M.dense						
13.30	16	35			MS	Dense						
14.30	20	36			MS	Dense	9	32			SM	M.dense
15.30	20	36			MS	Dense	23	37			MS	V.dense
16.30	23	37			MS	V.dense	23	37			MS	V.dense
17.30	16	35			MS	Dense						
18.30	10	32			MS	M.dense						
19.30	20	36			SM	Dense						
20.30	15	34			MS	Dense						
21.30	13	33			MS	Dense	20	36			MS	V.dense
22.30	19	35			MS	V.dense	19	36			MS	V.dense
23.30	19	35			MS	V.dense	6	30			MS	M.dense
24.30	13	33			MS	Dense	8	32			MS	M.dense
25.30	18	35			MS	V.dense	18	35			SM	V.dense
26.30	18	35			SM	V.dense	18	35			SM	V.dense
27.30	18	35			SM	V.dense	18	35			SM	V.dense
28.30	17	35			SM	V.dense						

Appendix I - Figures

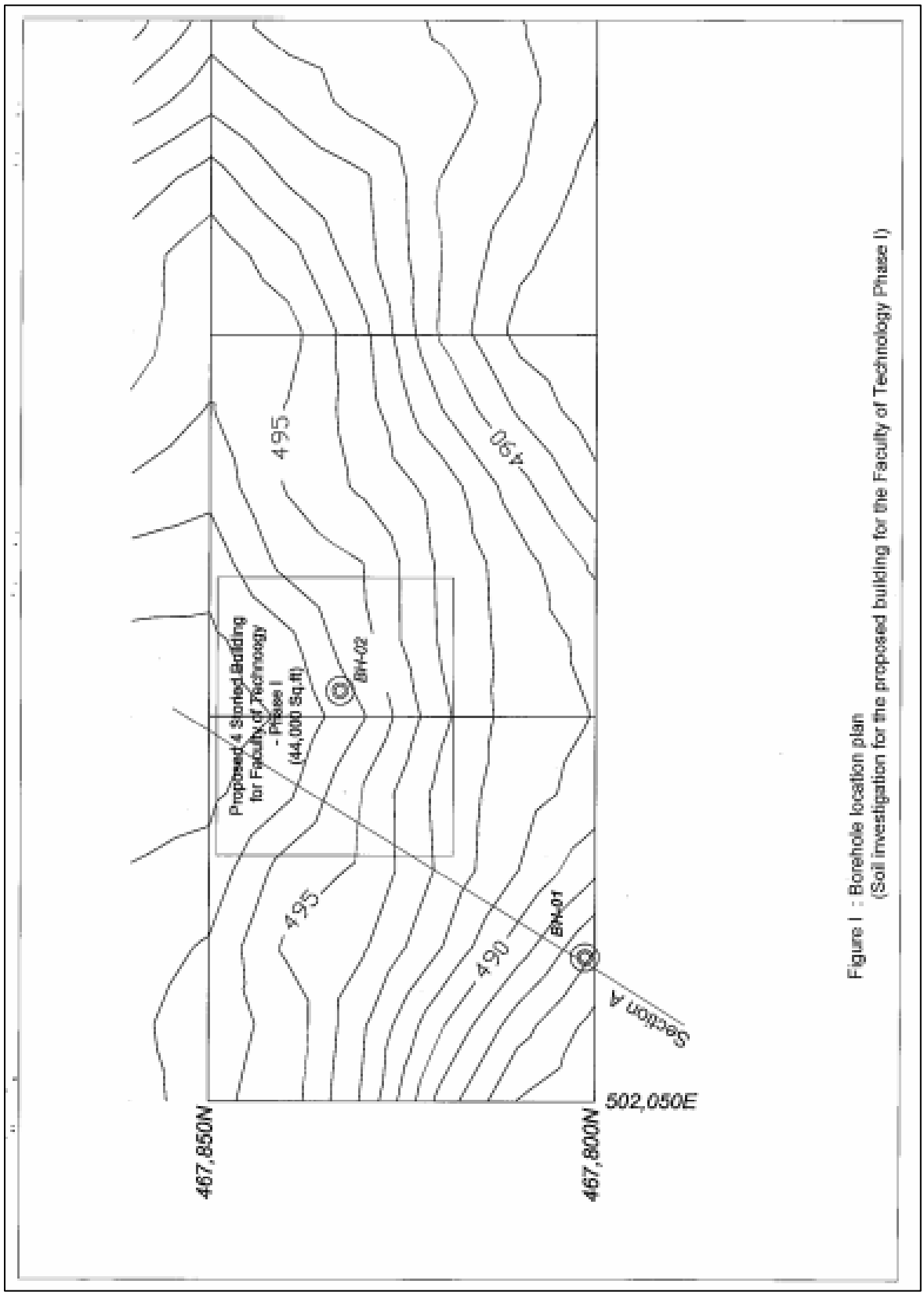


Figure I : Borehole location plan
(Soil investigation for the proposed building for the Faculty of Technology Phase I)

ANNEX 9: RAPID BIO DIVERSITY ASSESSMENT REPORT

Introduction

Sabaragamuwa University of Sri Lanka is currently in a process of developing new infrastructure facilities with a view to uplifting the quality of the undergraduate and the postgraduate education to match with the development needs in the country. In this context, the university administration is also committed to be positioned as an environmental friendly higher educational institute in Sri Lanka. However, the development agenda of the university is in need of new building complexes for the emerging faculties to strengthen its academic capacity, at the expense of patches of natural vegetation available within the land belonging to it. Nevertheless, being a responsible government institute, it is important to identify and understand the natural environment before making development interventions. This understanding will provide an immense benefit to the institution as it will be able to identify the long-term consequences of their activities, hence; adopt measures to enhance the quality of the surrounding natural ecosystem and their ecosystem functions.

The rapid biodiversity assessment (RBA) techniques were developed in 1990s by Conservation International, leading among many other contributors, to collect biological information to inform conservation decision-making (Alonso et al. 2011). RBA methods are designed to rapidly assess the biodiversity of highly diverse areas, identify the threats to this biodiversity, identify priority areas for conservation, strengthen community involvement and participation in conservation management, train local scientists in biodiversity survey techniques, and to develop management policies and sustainability options. Criteria used to identify priority areas for conservation include: overall species richness, presence of local endemics, rare species, threatened species, and habitat condition (Patrick et al. 2014).

In this context, the RBA reported here is an attempt to understand the ecological significance of the proposed site to be cleared for the construction of a new building complex for the Faculty of Technology, Sabaragamuwa University of Sri Lanka.

Objective and scope of the assessment

The prime objective of the rapid bio diversity assessment was to check whether there were any threatened or endemic species within the project area. Thus, this study was carried out over a period of one week from 04th to 12th May 2018.

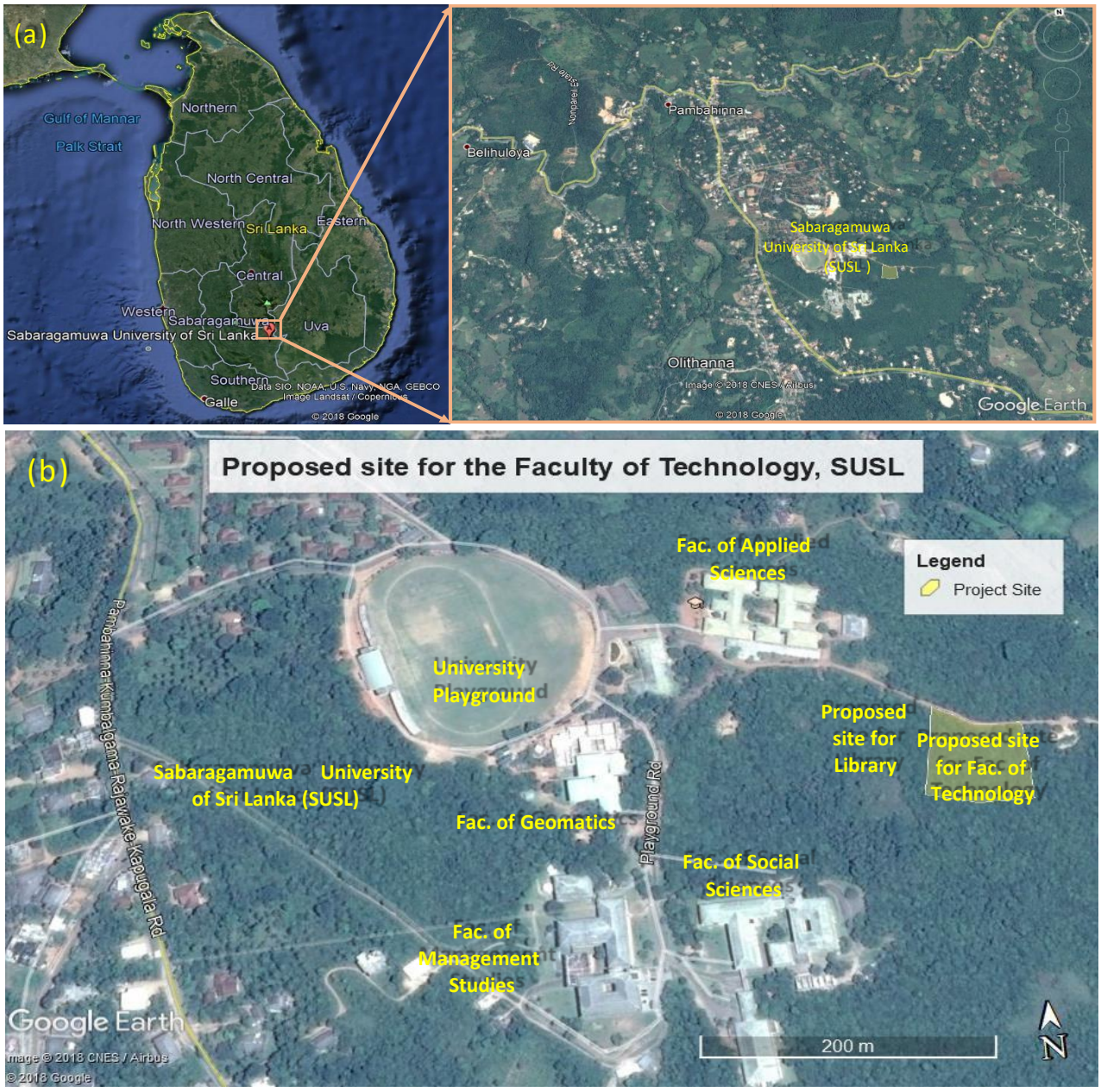
Proposed development project

Construction of a new building complex for the Faculty of Technology, Sabaragamuwa University of Sri Lanka has been proposed and approved by the Government of Sri Lanka. A site for the building complex has been identified by the university administration. An overview of the project area and the extent and scope of clearing are provided below.

Overview of the project area

The proposed site for the development of the Faculty of Technology of the Sabaragamuwa University of Sri Lanka (SUSL) [Project Site hereafter; See Figure 1(a) and 1(b)] comprises a patch of moist semi-evergreen forest belonging to the Eastern Intermediate Zone of Sri Lanka (Ashton and Gunatilleke 1987).

Figure 1: Location of the Proposed Site for the Development of the Faculty of Technology of the Sabaragamuwa University of Sri Lanka



Topography, geology and the climate

Proposed site is in the elevation of about 584 mean sea level (MSL) of the southern foothills of the central mountain range and 162 km away from Colombo, on the Colombo–Badulla (A4) road. Administratively, the site belongs to the Imbulpe Divisional Secretariat (DSD) and to the Ratnapura District in the Sabaragamuwa Province. The site is approximately 1. 5 km from the Pambahinna Junction, on the A4 highway this runs through Belihuloya. The closest city to the proposed site is Balangoda (20 km), the closest railway station is Haputale (32 km), while Bandarawela is only 42 km from the proposed site. Geologically the region consists of rocks belonging to Highland group, which comprises quartzites, marbles and undifferentiated meta

sediments (TEAMS 1992; Udayakumara et al. 2010, 2012). The mean annual rainfall varies from 900 to 3175 mm and the mean annual temperature of the study area varies from 25 to 28.8C^0 in the study area.

People and Landscape

The population of the surrounding area of the proposed site is not evenly distributed because of its terrain and land-use pattern (TEAMS 1992a, 1992b). The proposed project site and the surroundings are absolutely owned by the university and currently covered by a sparely forest as detailed below. Hence, there are no households or a community living in the immediate proximity to the project site. The land use pattern in and around the project site is rural with predominately agricultural lands. Project surrounding land can be categorized into residential, commercial, industrial and agricultural. When considering the land extent of the Muttettuwegama GN division there are agricultural lands (39%), forest area (33%) and streams (3 %) and other (25%). Further, the surrounding Muttettuwegama communities' dependence on the direct uses from the vegetation in the project site is minimal.

Habitat structure

Biogeographically, the proposed project area fallen within the intermediate zone. Floristically it is classified under the "Eastern intermediate lowlands" floristic zone or Moist Mixed Evergreen Forest (MMEF) (Ashton et al. 1997). Tropical moist semi evergreen forests and Savannah forests are the typical vegetation formations present in the "Eastern intermediate lowlands" floristic zone. The main habitats observed within the proposed project site is a low canopy sparse vegetation dominated with "Spicate Eugenia" (*Syzygium zeylanicum*) (Table 5) and with some other shrubs, herbs, orchids and ferns. Further, the surrounding area also consist with the same vegetation type (Table 6).

Status of biodiversity in the project area and conservation issues

The biodiversity prevailing in the project area is of importance due to its location in a bio geographical transition between the wet zone to the west and the dry zone to the east, being located in a thin strip of the intermediate zone. Further the project site is located on the second peneplain of the country again within a thin strip of the same between the World's End escarpment to the north ascending to the Horton Plains in the third (highest) peneplain, and the Handagiriya-Kalthota escarpment to the south descending to the first peneplain of lowland coastal zone. Due to these bio geographical setting surrounded by physical and climatic barriers the larger landscape in which the project site it situated carries and important biodiversity with a high element of endemicty, although not high as in the lowland and montane wet zones of the country. Status of the species diversity within the project site and the vulnerable components of biodiversity within the project site are further discussed in the results section.

The extent and scope of clearing

Even though the extent of the proposed project site is 2.4ha, only about 0.38 ha (15.8%) will nearly be utilized for the proposed buildings (Class rooms, laboratories, staff rooms, departments, dean's office, reading rooms, student common room, auditorium, computer admin office room, library, exam halls, cafeteria, security office etc.).

Rapid Biodiversity Assessment Methodology

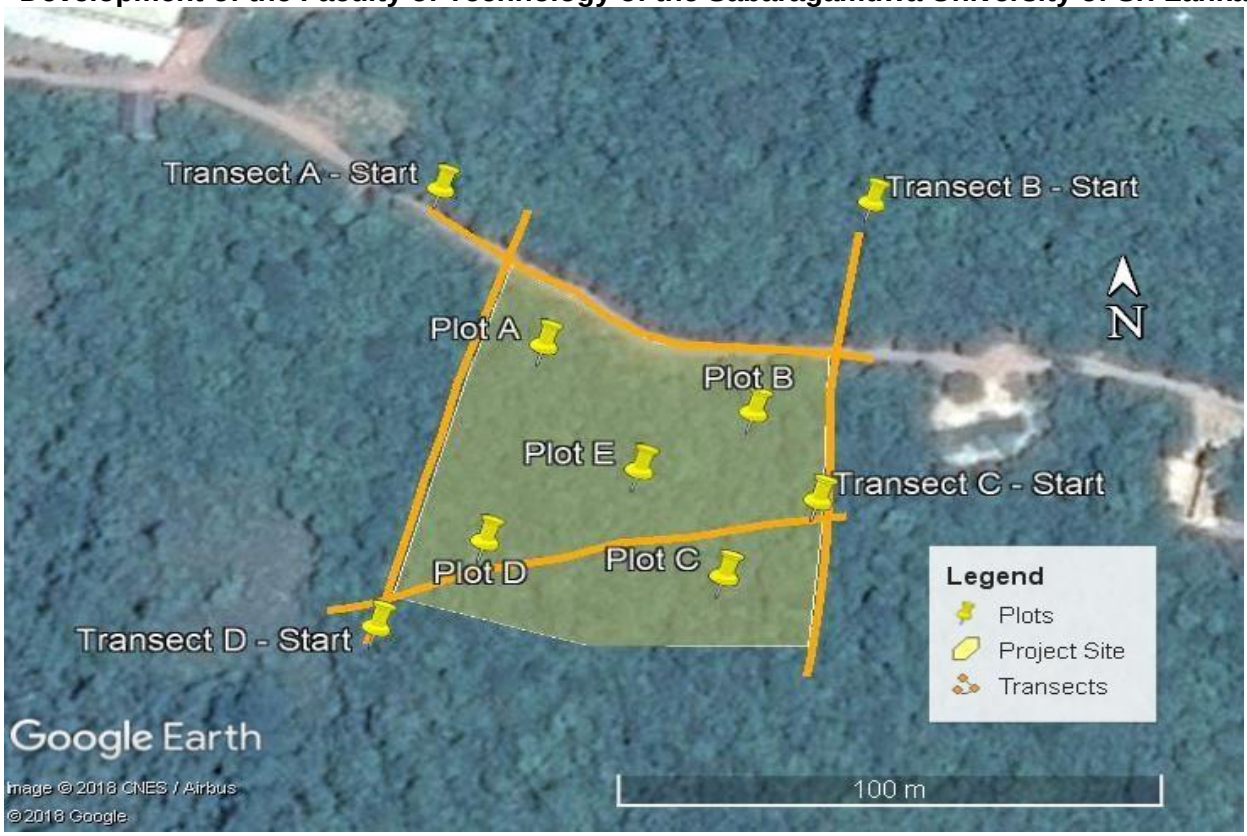
This RBA was conducted over a period of one week from 04thto 12thMay 2018, with at least two repeated sampling in each of the demarcated transacts and/or plots. The study was generally based on visual encounter surveys including diurnal as well as nocturnal sampling for animals also including live trapping attempts for small mammals. Further details of the methodology are discussed separately for flora and fauna.

Study methods for flora

Quadrate sampling method was used for the plant diversity analysis. Five sampling quadrates (20m x 10m) were demarcated at four edges and on the middle representing the proposed faculty area (Plots A to E in Figure 2 and Table 1).

The number of individual trees (whose dbh is ≥ 10 cm) was marked in site and tree data sheets by assigning each individual a number. For each individual tree, the tree height and the diameter were measured. Further presence of the other important plant species including grasses, orchids, herbs and lianas were recorded. All plants were identified with the help of herbarium specimens, published books and checklists (Senaratna 2001). A Global Positioning System receiver (Garmin-Etrex) was used in recording the spatial geo-coordinates of observations.

Figure 2: Placement of Sampling Sites (Transects and Plots) in Proposed Site for the Development of the Faculty of Technology of the Sabaragamuwa University of Sri Lanka



(Plots A to E for flora, Transects A to D for fauna with high dispersal ability and Litter Plots A to D for land snails – i.e. fauna with low dispersal ability)

Table 1: Systematic Sampling Quadrates Investigated During the Rapid Biodiversity Assessment in Proposed Site for the Development of the Faculty of Technology of the Sabaragamuwa University of Sri Lanka

Sample site	GPS coordinates (at start)	Habitat	Taxa sampled in
Plot A	6°42'35.71"N; 80°47'33.76"E	Forest Interior	Plants
Plot B	6°42'35.22"N; 80°47'35.09"E	Forest Interior	Plants
Plot C	6°42'34.08"N; 80°47'34.93"E	Forest Interior	Plants

Plot D	6°42'34.33"N; 80°47'33.45"E	Forest Interior	Plants
Plot E	6°42'34.25"N; 80°47'34.47"E	Forest Interior	Plants

Figure 3: Habitats Sampled at Each Sampling Sites (Transects and Plots) in the Proposed Site for the Development of the Faculty of Technology of the Sabaragamuwa University of Sri Lanka (Plot A to E and at the Start of Each Transect A to D).

A. Upper left corner of the site (Plot A); B. Left corner of the site demarcating the cleared road down to the bottom margin of the proposed site (Plot A to B); C. inside the proposed area cleared for the line transects; D. *Syzygium zeylanicum* (Yakada Maran) and E. Large trees of *Cinnamomum citriodorum* (Pangiri Kurundu).

Study methods for fauna

Surrogate taxa

All vertebrate groups and few selected groups of invertebrates were selected as surrogate taxa to represent the animal diversity in the project site. Among the vertebrate taxa freshwater fish were not included in the study as the project area lacks any permanent aquatic habitats, while temporary water holes created during the rainy seasons were investigated to record the amphibian fauna. References used in species identification for each taxa are listed in the Table 2, while the taxonomy and species traits such as endemism, winter visitor status, etc. follows the latest publication under each taxa. Here we followed the traditional classification of five vertebrate classes including the class Reptilia, not considering the recent phylogenetic classification in Amniotes, in which Reptilia is paraphyletic. Conservation status of each species follows the latest national red list of threatened species (MOE 2012).

Table 2: References Used in Species Identification for Each Taxa. Please Note that the Taxonomy and Species Traits Follows the Latest Publication Under Each Taxa

Taxonomic Group	References
Butterflies	(Jayasinghe, Rajapakshe, and De Alwis 2015; Van der Poorten and Van der Poorten 2016)
Dragonflies and Damselflies	(Bedjanič et al. 2014; Sumanapala 2017)
Land Snails	(Naggs and Raheem 2000)
Amphibians	(Manamendra-Arachchi and Pethiyagoda 2006)
Reptiles	(Somaweera 2006; Somaweera and Somaweera 2009)
Birds	(Harrison 2011; Kotagama and Ratnavira 2010)
Mammals	(Phillips 1980)

Overall sampling techniques for Fauna

Visual Encounter Survey (VES) method was used as the primary technique in recording the fauna in project site during the first half of May 2018. The faunal survey and was carried out during both day and night to record all possibly identified animal species belonging to the taxonomic groups we selected for the study. Almost all the less mobile animals encountered during the VES were hand captured and/or photographed for accurate species identification. Further, an advance technique of live trapping (using Sherman traps) was used to record small mammals. Sherman traps were baited with roasted coconut and dry fish to attract small mammals in to it. In addition to the use of traps, active searching in micro-habitats preferred by the surrogate animal groups improved the detection probability of animals during the VES. Such opportunistic searching was performed in leaf litter and spaces under decaying logs (especially for land snails, skinks, soil snakes, some amphibians), tree-holes (especially for amphibians, geckos and tree mice), and temporary water holes (especially for amphibians) in order to locate cryptic animals, where and whenever possible during both the day and night. Nocturnal sampling was aided with powerful torches and head lamps, while binoculars (Nikon – Action 8×42) were used during the diurnal observations on birds and other arboreal species. A Global Positioning System receiver (Garmin – Etrex) was used in recording the spatial geo-coordinates of observations. Most of the specimens found on low mobile and small groups of animals were photographed with a digital SLR camera (Cannon ESO 1000D) and used for confirmation of field identification, with expert opinions when necessary.

Systematic sampling of fauna

While the VES opportunistic observations populated the checklists for selected surrogate taxa, systematic sampling was also conducted in order to calculate Shannon-Wiener and Simpson indices of species diversity. Four 100m line transects (for all surrogate taxa except for mammals and reptiles) and four 100m^2 litter plots (for land snails) were established to represent two major habitat features in the area, i.e. the forest edge and the forest interior (see Figure 2). Only the land snails were studies within plots among the faunal groups due to their lower mobility, all other surrogate taxa were of considerably high mobility and hence sampled along the same transects although with different transect widths appropriate to the faunal group.

The project site does not comprise any other major habitat type within it. Hence the main habitat gradient to direct transects within the project site was the elevation. Therefore, transects A and C were established roughly along the contour while transects B and D were directed by the elevation gradient. GPS coordinates and habitat details of the sampling locations (transects and plots) are provided in the Table 3. Shannon-Wiener and Simpson indices of species diversity were calculated for all systematic sampling attempts in transects and litter plots using True Diversity (Goepel 2012). Finally, individual sample indices were averaged for each taxonomic group after pooling all samples as the forest interior and forest edge samples did not differ significantly. Additionally, opportunistic observations were conducted in the disturbed/developed areas in the periphery of the project site, while previous observations made by the field team during the past three years and any published information were also used to supplemented the checklists. Specific techniques used in recording species in each group are given in Table 4.

Table 3: Systematic Sampling Transects and Litter Plots Investigated During the Rapid Biodiversity Assessment in Proposed Site for the Development of the Faculty of Technology of the Sabaragamuwa University of Sri Lanka

Sample site	GPS coordinates (at start)	Habitat	Taxa sampled in
Transect A	6°42'36.95"N; 80°47'32.99"E	Forest Edge	Birds, Amphibians, Butterflies, Dragonflies & Damselflies (Odonates), Land snails
Transect B	6°42'36.87"N; 80°47'35.81"E	Forest Interior	Birds, Amphibians, Butterflies, Odonates
Transect C	6°42'34.60"N; 80°47'35.50"E	Forest Interior	Birds, Amphibians, Butterflies, Odonates
Transect D	6°42'33.75"N; 80°47'32.81"E	Forest Edge	Birds, Amphibians, Butterflies, Odonates
Plot A	6°42'35.71"N; 80°47'33.76"E	Forest Interior	Land snails
Plot B	6°42'35.22"N; 80°47'35.09"E	Forest Interior	Land snails
Plot C	6°42'34.08"N; 80°47'34.93"E	Forest Interior	Land snails
Plot D	6°42'34.33"N; 80°47'33.45"E	Forest Interior	Land snails

Table 4: Taxonomic Groups and Relevant Methods Used for the Rapid Biodiversity Assessment

Taxonomic Group	Methods used	Details of Sampling

Butterflies	Time restricted line transects (100m × 5m; 30 minutes) Opportunistic observations Previous records	5 diurnal transects: Forest edge (A on two days, D once); Forest interior (B & C once each)
Dragonflies and Damselflies	Time restricted line transects (100m × 5m; 30 minutes) Opportunistic observations	5 diurnal transects: Forest edge (A on two days, D once); Forest interior (B & C once each)
Land Snails	Time restricted line transects (100m × 5m; 30 minutes) Time restricted litter plots (10m × 10m; 30 minutes) Opportunistic observations	2 diurnal litter plots: Forest interior (A & D); 2 nocturnal litter plots: Forest interior (B & C); 2 nocturnal transects: Forest edge (A on two nights)
Amphibians	Time restricted line transects (100m × 5m; 30 minutes) Opportunistic observations	5 nocturnal transects: Forest edge (A on two days, D once); Forest interior (B & C once each)
Reptiles	Opportunistic observations Previous records	Not relevant
Birds	Time restricted line transects (100m ×30m; minutes) Opportunistic observations Previous records Published information	4 transects in the dawn (A & D on two days); 2transects in the afternoon (A on two days)
Mammals	Sherman Trapping Opportunistic observations Previous records	Nocturnal Sherman trapping (200 trap hours)

Data Analysis

Results of the counts of individuals belonging to each species during the VES are enumerated in the results tables while two prominently used indices to indicate the species diversity, *viz.*Shannon-Wiener diversity index and the Simpson's diversity index were calculated as elaborated below.

Calculation of Shannon-Wiener species diversity index

Shannon wiener species diversity index was employed in order to calculate the Bio Diversity Index. The index has been used to measure the effects of habitat quality such as habitat disturbance. The result in a diversity value (H') range between 0 and 4. Shannon wiener species diversity index was calculated for plants which are significant indicator for habitat changes.

H'- Shannon-Wiener Diversity Index

$$H = -\sum_{i=1}^{k} p_i \log p_i$$

P_i - Proportion of each species in the sample

Calculation of Simpson's index (D)

Simpson's diversity index was calculated using the following equation.

$$D = \frac{\Sigma\, n(n-1)}{N(N-1)}$$

Where,

n = the total number of organisms of a particular species N = the total number of organisms of all species

Results

Vegetation type and floral composition

Typical savannah vegetation does not exist in this area as most of the vegetation was highly modified due to climax vegetation. The Shannon wiener species diversity index for plant species (>10 dbh) was -1.08 and the Simpson's Index was 0.25 for the total survey area (Table 7). This value indicates significantly low plant species diversity in the proposed site.

The total number of the spontaneously occurring vascular plant species, which have been noted within the survey site represents 55 % of *Syzygium zeylanicum* and the rest were represented by *Acronychia pedunculata*, *Cinnamomum citriodorum*, *Pagiantha dichotoma*, and *Symplocos cochinchinensis*. Many of them were considered as Least Concern species according to the National Red List 2012 (Table 5). Further few trees species found with less than 10 cm dbh (Table 6).

Further, higher number of shrubs including *Dianella enzifolia*, *Gaertnera walkeri* and herbs including *Osbeckia ochtandra, Clidemia hirta* were consisted in the area. The climbers are uncommon and *Smilax zeylanica* was found as a one species. Few orchids were common to the studied area including *Dendrobium aphyllum*, and *Polystachya concreta*. The scanty ground layer was consisted of some fern species such as *Schizia digitata,* and *Lindsaea repense* etc. Further single epiphytic fern was found as *Drynaria quercifolia* (Table 6) (Figure 3). Further the species *Clidemia hirta* was found as an invasive species.

Figure 4: Some Recorded Plant Species at the Proposed Site of Technology Faculty

A. *Clidermia hirta* (Katakalu Bovitiya); B. Unknown Grass; C. *Osbeckia octandra* (Heen Bovitiya); D. *Dianella ensifolia* (Monara Pethan); E. *Syzygium zeylanicum* (Yakada Maran); F: *Lasianthus sp.*; G. *Dendrobium aphyllum* (Poson Mal) and H. *Smilax zeylanica* (Kabaressa)

Table 5: Detailed checklist of flowering plants those having more than 10 cm diameter of the stem observed at the proposed site for the development of the Faculty of Technology of the Sabaragamuwa University of Sri Lanka in Belihuloya

FAMILY	SPECIES	COMMON NAME	Avg. Height (m)	Avg. DBH (cm)	% Abundance	No. of Species	EVOLUTIONARY STATUS	CONSERVATION STATUS	RECORDED FROM		
									Project Site	Periphery	Outside
Rutaceae	*Acronychia pedunculata*	Ankenda	16.7	7.00	8.89	01	Native	LC	√		√
Lauraceae	*Cinnamomum citriodorum*	Pangiri Kurundu	21.5	6.35	22.22	10	Endemic	VU	√	√	√
Apocynaceae	*Pagiantha dichotoma*	Divi Kaduru	14.8	7.00	6.67	03	Native	LC	√		√
Symplocaceae	*Symplocos cochinchinensis*	Bombu	13.0	6.50	4.44	02	Native	LC	√		
Myrtaceae	*Syzygium zeylanicum*	Yakada Maran	16.0	4.88	55.50	25	Native	LC	√	√	√
Myrtaceae	*Syzygium* sp.		10.0	3.50	2.20	01			√		√

Abbreviations used: NCS - National Conservation Status_Red List 2012; **LC** - Least Concern; **VU** - Vulnerable.

Table 6: Detailed checklist of other flowering plants and lower plants observed at the proposed site for the development of the Faculty of Technology of the Sabaragamuwa University of Sri Lanka in Belihuloya

FAMILY	SPECIES	COMMON NAME	No. of Species	EVOLUTIONARY STATUS	CONSERVATION STATUS	RECORDED FROM		
						Project Site	Periphery	Outside
Tree species (< 10 cm DBH)								
Ochnaceae	*Gomphia serrata*	Mal keera	03	Native	LC	√		√
Thymelaeaceae	*Gyrinops walla*	Walla Patta	02	Native	VU	√	√	√
Rubiaceae	*Psychotria nigra*		03	Native	LC	√		√
Climbers								
Smilacaceae	*Smilax zeylanica*	Kabaressa	05	Native	LC	√	√	√
Shrubs/Herbs								
Xanthorrhoeaceae	*Dianella ensifolia*	Monara pethan	06	Native	LC	√	√	√
Melastomataceae	*Osbeckia octandra*	Heen Bovitiya	05	Endemic	LC	√	√	√
Melastomataceae	*Clidemia hirta*	Katakalu Bovitiya	15	Introduced	LC	√	√	√
Rubiaceae	*Gaertnera walkeri*		02	Endemic	NT	√		√
Iridaceae	*Aristea* sp.		02			√		√
Rubiaceae	*Lasianthus* sp.		01			√		√
Orchids								
Orchidaceae	*Dendrobium aphyllum*	Poson Mal	08	Native	LC	√		√
Orchidaceae	*Polystachya concreta*		10	Native	LC	√		√
Ferns								

Polypodiaceae	*Drynaria quercifolia*	Benduru	08	Native	LC	√		√
Lindsaeaceae	*Lindsaea repens*		15	Native	CR	√	√	√
Schizaeaceae	*Schizaea digitata*		12	Native	NT	√	√	√

Abbreviations used: NCS - National Conservation Status_Red List 2012; CR - Critically Endangered; **LC** - Least Concern; **NT** - Near Threatened; VU - Vulnerable.

Table 7: Shannon and Simpson's diversity indices of different floral categories observed at the proposed site for the development of the Faculty of Technology of the Sabaragamuwa University of Sri Lanka in Belihuloya

Species Category	Shannon's Diversity Index (H)	Simpson's Index (D)
Tress< 10cm diameter	1.0822	0.2500
Shrubs and Herbs	1.4278	0.2838
Ferns	0.6869	0.4771
Orchids	1.0674	0.3344

Composition of Fauna

The study reported 143 species, including 97 species of vertebrates, representing 50 families and 46 species from the selected invertebrate taxa representing 11 families. Those species were recorded to inhabit the moist-semi-evergreen forest patch in the project area and its periphery, as well as those disturbed/developed areas outside the immediate periphery. This include 18species endemic to Sri Lanka, while none of them are restricted-range species within the study area. Further, nine species among them are listed as nationally threatened species (MOE, 2012). Three species of land snails, and a single species each of amphibians and reptiles are identified only to the genus level due to remaining taxonomic ambiguities and the reptile among them belonging to the endemic genus *Lankascincus* could well be an undescribed species. All above species (5) are hence listed as Data Deficient. Further, two non-indigenous species were recorded to inhabit the project site, both of them being land snails, one is an exotic/introduced species (*Macrochlamys indica*) while the other is an invasive alien species (*Lissachatina fulica*). Taxon specific information on the species numbers for each group is summarised in the Table 4, while critical species inhabiting the project site within each taxonomic group is discussed later and some of which are illustrated in the Figure 4. On a specific note on the small mammals, Sherman trapping did not contribute significantly to the findings of the present survey probably caused by the low number of trap hours (200), and the prevailing moist weather conditions with afternoonevening showers during the sampling period. Interestingly the only rodent trapped in a nocturnal trapping session was a diurnal palm squirrel.

The total checklist of fauna recorded (Table 8) is evident of a moderately high species richness of the study taxa within the project site, also including an above average percentage of endemic species, but with a lower percentage of threatened species. The endemic and threatened species are recorded from less mobile taxa such as the land snails, reptiles and amphibians. Critical species and populations of conservation importance under each taxonomic group which are of concern due to the proposed development in the site are discussed in a separate section later.

Table 8: Summary of species composition of tetrapod vertebrates and selected invertebrate groups within the proposed site for the development of the Faculty of Technology of the Sabaragamuwa University of Sri Lanka

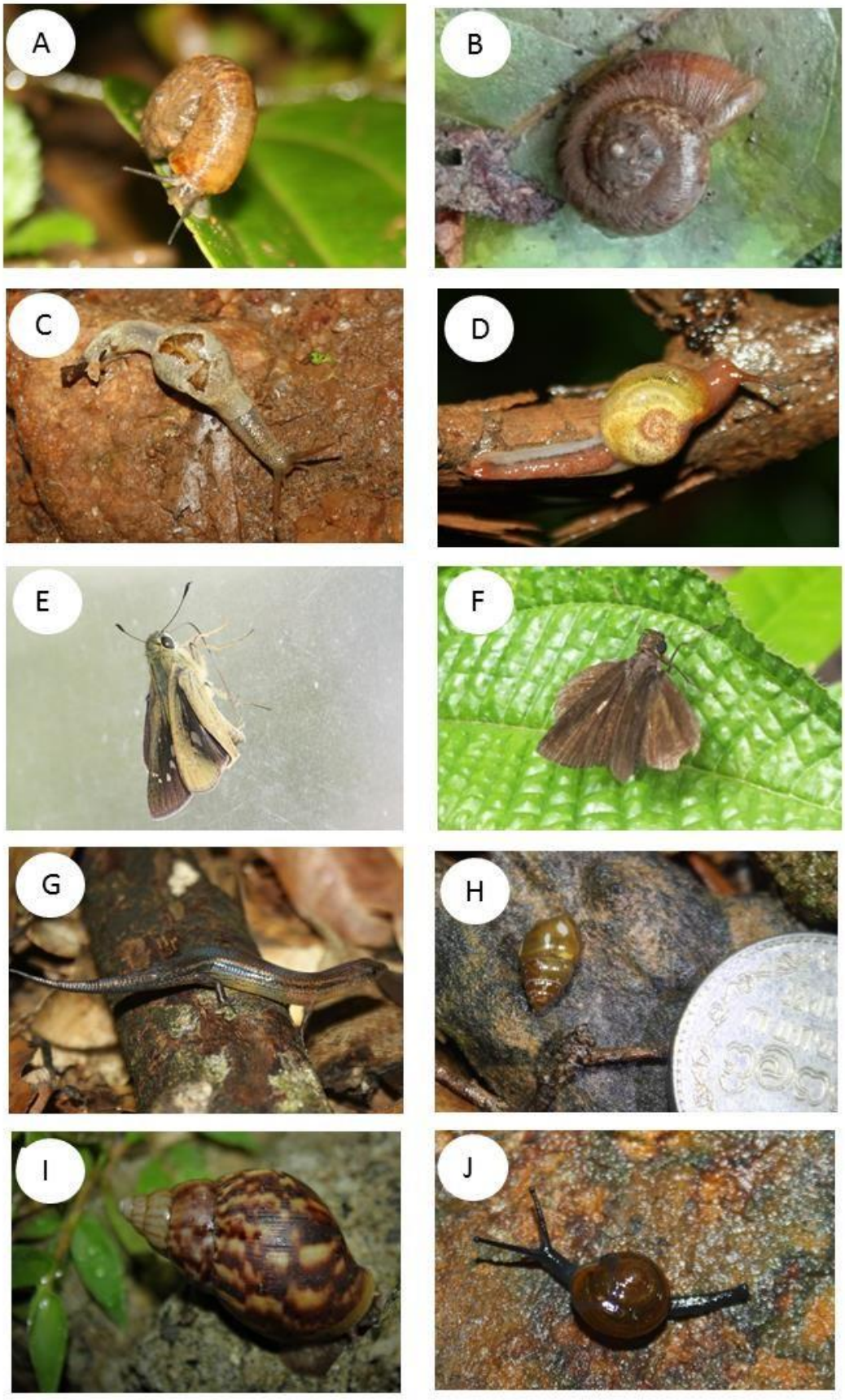
Taxonomic Group	No. of species	No. & (%) endemic species	No. & (%) threatened species
Land snails	10	4 (40%)	4 (40%)
Odonates	7	0	0
Butterflies	29	2 (6.9%)	2 (6.9%)
Amphibians	5	2 (40%)	0
Reptiles	15	1 (6.7%)	0
Birds	68	8 (11.8%)	1 (1.5%)
Mammals	9	1 (11.1%)	3 (33.3%)
TOTAL	143	18 (12.6%)	10 (7%)

Table 9 provides an indication of the level of species diversity in each taxa as depicted by the Shannon-Wiener and Simpson's indices, based on the species richness as well as the evenness of abundance between species (Annex I-IV). The species diversity indices identify the site to harbour a high diversity of bird fauna as well as a moderate to high diversity of butterfly and land snail fauna among the taxonomic groups selected for the present study. Detailed checklists of all recorded species are given in the Table 10.

Table 9: Species diversity selected taxonomic groups of vertebrates and invertebrates within the proposed site for the development of the Faculty of Technology of the Sabaragamuwa University of Sri Lanka

Taxonomic Group	**Diversity Index**	**Sample 1**	**Sample 2**	**Sample 3**	**Sample 4**	**Sample 5**	**Sample 6**	**Average**	**Overall conclusion**
Land snails	Shannon-Wiener Index (H')	1.314	1.465	0.693	1.04	1.831	0.937	**1.213**	Moderate to high diversity.
	Simpson's Index (1-D)	0.667	0.741	0.5	0.625	0.827	0.568	**0.655**	
Odonates	H'	0 (single species)	0.639	No specimens	No specimens	No specimens	×	**0.32**	Very low diversity
	1-D		0.5				×	**0.25**	
Butterflies	H'	2.435	1.677	1.332	0.693	0.868	×	**1.401**	Moderate to high diversity
	1-D	0.902	0.79	0.72	0.5	0.5	×	**0.682**	
Amphibians	H'	0.683	1.040	No specimens	No specimens	0.956	×	**0.893**	Low diversity
	1-D	0.49	0.625			0.571	×	**0.562**	
Birds	H'	2.815	1.733	1.550	2.581	2.049	1.889	**2.103**	High diversity
	1-D	0.929	0.813	0.776	0.915	0.853	0.84	**0.854**	

Figure 5: Selected (Critical and Invasive) Animal Species Recorded from the Project Site



(A) *Aulopoma itieri* (Itier's Operculate Snail - an endemic and endangered land snail species), (B) *A. sphaeroidium* (Sphaeroid's Operculate Snail - an endemic and endangered land snail species), (C)*Ratnadvipia irradians* (Sri Lanka Ratnadeepa Snail - an endemic and vulnerable land snail species), (D)*Satiella* sp. (a possibly endemic undescribed lucid land snail species), (E)*Pelopidas conjuncta* (Conjoined Swift -a vulnerable butterfly species), (F)*Baracus vittatus* (Sri Lankan Hedge Hopper – an endemic and vulnerable butterfly species), (G)*Lankascincus* sp. (a possibly endemic and undescribed Lankaskink species), (H)*Glessula* sp.(a possibly endemic undescribed corkscrew land snail species), (I)*Lissachatina fulica* (Giant African Snail - an invasive alien land snail species), and (J)*Macrochlamys indica* (Macro Lucid Snail - an exotic land snail species).

Table 10: Detailed checklist of all animal species recorded during the rapid biodiversity assessment in proposed site for the development of the Faculty of Technology of the Sabaragamuwa University of Sri Lanka in Belihuloya

FAMILY	SPECIES	COMMON NAME	EVOLUTIONARY STATUS	CONSERVATION STATUS	RECORDED FROM		
					Project Site	Periphery	Outside
CLASS GASTROPODA: Only land Snails are considered							
Achatinidae	*Lissachatina fulica*	Giant African Snail	IAS	NE	√	√	√
Ariophantidae	*Cryptozona bistrialis*	Common Translucent Snail	Ind	LC	√	√	√
Ariophantidae	*Macrochlamys indica*	Macro Lucid Snail	Exo	NE	√		√
Ariophantidae	*Ratnadvipia irradians*	Sri Lanka Ratnadeepa Snail	End	VU	√	√	
Ariophantidae	*Satiella sp*	Lucid Satiella Snail Species	Ind	DD	√	√	
Camaenidae	*Beddomea trifasciatus*	Three-banded Beddomea Snail	End	VU	√		√
Cyclophoroidea	*Aulopoma itieri*	Itier's Operculate Snail	End	EN	√	√	√
Cyclophoroidea	*Aulopoma sphaeroidium*	Sphaeroid's Operculate Snail	End	EN	√		√
Glessulidae	*Glessula sp A*	Corkscrew Snail Species (short)	Ind	DD	√		√
Glessulidae	*Glessula sp B*	Corkscrew Snail Species (long)	Ind	DD	√		√
ORDER ODONATA: Dragonflies and Damselflies							
Libellulidae	*Acisoma panorpoides*	Asian Pintail	Ind	LC	√		√
Libellulidae	*Brachythmis contaminata*	Asian Groundling	Ind	LC	√		√
Libellulidae	*Diplacodes trivialis*	Blue Percher	Ind	LC	√	√	√
Libellulidae	*Neurothemis tullia*	Pied Parasol	Ind	LC	√		√
Libellulidae	*Orthetrum luzonicum*	Marsh Skimmer	Ind	NT	√		√
Libellulidae	*Orthetrum sabina sabina*	Green Skimmer	Ind	LC	√		√
Libellulidae	*Pantala flavescens*	Wandering Glider	Ind	LC	√	√	√

CLASS AVES: Birds							
Accipitridae	*Accipiter badius*	Shikra	BrR	LC			√
Accipitridae	*Spilornis cheela*	Crested Serpent Eagle	BrR	LC	√		√
Aegithinidae	*Aegithina tiphia*	Common Iora	BrR	LC	√	√	√
Alcedinidae	*Halcyon smyrnensis*	White-throated Kingfisher	BrR	LC		√	√
Apodidae	*Apus affinis*	House Swift	BrR	LC			√
Apodidae	*Collocalia unicolor*	Indian Swiftlet	BrR	LC	√		
Apodidae	*Cypsiurus balasiensis*	Asian Palm Swift	BrR	LC	√		√
Bucerotidae	*Ocyceros gingalensis*	Sri Lanka Grey Hornbill	End	LC		√	√
Campephagidae	*Coracina melanoptera*	Black-headed Cuckooshrike	BrR	LC	√		√
Campephagidae	*Pericrocotus cinnamomeus*	Small Minivet	BrR	LC	√		√
Campephagidae	*Pericrocotus flammeus*	Scarlet Minivet	BrR	LC	√		√
Caprimulgidae	*Caprimulgus asiaticus*	Common Nightjar	BrR	LC		√	
Chloropseidae	*Chloropsis jerdoni*	Blue-winged Leafbird	BrR	LC	√		√
Cisticolidae	*Prinia inornata*	Plain Prinia	BrR	LC			√
Columbidae	*Chalcophaps indica*	Emerald Dove	BrR	LC	√		
Columbidae	*Columba livia*	Domestic Pigeon	BrR	NE			√
Columbidae	*Ducula aenea*	Green Imperial Pigeon	BrR	LC	√		√
Columbidae	*Streptopelia chinensis*	Spotted Dove	BrR	LC	√		√
Columbidae	*Treron pompadora*	Pompadour Green-pigeon	End	LC	√		√
Corvidae	*Corvus levaillantii*	Large-billed Crow	BrR	LC	√		
Corvidae	*Corvus splendens*	House Crow	BrR	LC			√
Cuculidae	*Centropus sinensis*	Greater Coucal	BrR	LC	√		√
Cuculidae	*Clamator coromandus*	Chestnut-winged Cuckoo	WV	NE			√
Cuculidae	*Cuculus micropterus*	Indian Cuckoo	WV	NE			√
Cuculidae	*Eudynamys scolopacea*	Asian Koel	BrR	LC	√	√	
Cuculidae	*Phaenicophaeus viridirostris*	Blue-faced Malkoha	BrR	LC		√	√

Dicaeidae	*Dicaeum erythrorhynchos*	Pale-billed Flowerpecker	BrR	LC	√		√
Dicruidae	*Dicrurus caerulescens*	White-bellied Drongo	BrR	LC	√		√
Estrididae	*Lonchura punctulata*	Scaly-breasted Munia	BrR	LC	√	√	√
Estrididae	*Lonchura striata*	White-rumped Munia	BrR	LC		√	√
Hirundinidae	*Hirundo daurica*	Red-rumped Swallow	BrR	LC		√	√
Meropidae	*Merops leschenaulti*	Chestnut-headed Bee-eater	BrR	LC			√
Meropidae	*Merops orientalis*	Green Bee-eater	BrR	LC			√
Meropidae	*Merops philippinus*	Blue-tailed Bee-eater	WV	CR		√	√
Monarchidae	*Hypothymis azurea*	Black-naped Monarch	BrR	LC	√		
Monarchidae	*Terpsiphone paradisi*	Asian Paradise- flycathcher	BrR	LC		√	√
Muscicapidae	*Copsychus malabaricus*	White-rumped Shama	BrR	LC	√		
Muscicapidae	*Copsychus saularis*	Oriental Magpie Robin	BrR	LC		√	√
Muscicapidae	*Saxicoloides fulicata*	Indian Robin	BrR	LC		√	√
Nectariniidae	*Nectarina asiatica*	Purple Sunbird	BrR	LC	√	√	√
Nectariniidae	*Nectarina lotenia*	Loten's Sunbird	BrR	LC	√		√
Nectariniidae	*Nectarina zeylonica*	Purple-rumped Sunbird	BrR	LC	√		√
Oriolidae	*Oriolus xanthornus*	Black-hooded Oriole	BrR	LC	√		√
Passeridae	*Passer domesticus*	House Sparrow	BrR	LC			√
Phasianidae	*Gallus lafayetii*	Sri Lanka Junglefowl	End	LC	√		√
Phasianidae	*Pavo cristatus*	Indian Peafowl	BrR	LC			√
Picidae	*Dinopium psarodes*	Sri Lanka Lesser Flameback	End	LC	√		
Pittidae	*Pitta brachyura*	Indian Pitta	WV	NE			√
Psittacidae	*Loriculus beryllinus*	Sri Lanka Hanging Parakeet	End	LC			√
Psittacidae	*Psittacula krameri*	Rose-ringed Parakeet	BrR	LC	√		√
Pycnonotidae	*Hypsipetes leucocephalus*	Black Bulbul	BrR	LC		√	√
Pycnonotidae	*Pycnonotus cafer*	Red-vented Bulbul	BrR	LC	√		√
Pycnonotidae	*Pycnonotus luteolus*	White-browed Bulbul	BrR	LC	√		√
Pycnonotidae	*Pycnonotus melanicterus*	Black-crested Bulbul	End	LC	√		

Rallidae	*Rallina eurizonoides*	Slaty-legged Crake	BrR	VU		√	
Ramphastidae	*Megalaima haemacephala*	Coppersmith Barbet	BrR	LC			√
Ramphastidae	*Megalaima zeylanica*	Brown-headed Barbet	BrR	LC	√		√
Rhipiduridae	*Rhipidura aureola*	White-browed Fantail	BrR	LC			√
Strigidae	*Bubo nipalensis*	Spot-bellied Eagle Owl	BrR	NT		√	
Sturnidae	*Acridotheres tristis*	Common Myna	BrR	LC	√	√	√
Sturnidae	*Gracula religiosa*	Hill Myna	BrR	LC	√		
Sylviidae	*Orthotomus sutorius*	Common Tailorbird	BrR	LC	√		√
Timalidae	*Dumetia hyperythra*	Tawny-bellied Babbler	BrR	LC		√	√
Timalidae	*Pellorneum fuscocapillum*	Sri Lanka Brown-capped Babbler	End	LC	√		√
Timalidae	*Pomatorhinus melanurus*	Sri Lanka Scimitar Babbler	End	LC		√	
Timalidae	*Rhopocichla atriceps*	Dark-fronted Babbler	BrR	LC	√		
Timalidae	*Turdoides affinis*	Yellow-billed Babbler	BrR	LC		√	√
Zosteropidae	*Zosterops palpebrosus*	Oriental White-eye	BrR	LC		√	√

CLASS MAMMALIA: Mammals							
Cercopithecidae	*Macaca sinica*	Sri Lanka toque monkey	End	LC	√		√
Cervidae	*Muntiacus muntjak*	Barking deer	Ind	NT		√	
Felidae	*Prionailurus viverrinus*	Fishing cat	Ind	EN		√	
Herpestidae	*Herpestes vitticollis*	Stripe-necked mongoose	Ind	VU		√	
Leporidae	*Lepus nigricollis*	Black-naped hare	Ind	LC		√	
Muridae	*Rattus*	Common rat	Ind	LC			√
Sciuridae	*Funambulus palmarum*	Palm squirrel	Ind	LC	√		
Sciuridae	*Ratufa macroura*	Giant squirrel	Ind	LC	√		
Vespertillionidae	*Pipistrellus coromandra*	Indian pipistrel	Ind	VU			√

EXPLANATORY NOTES

Evolutionary Status (in relation to Sri Lanka): *Ind - Indigenous; End - Endemic; BrR - Breeding resident; WV - Winter visitor; Exo - Exotic in their origin and evolution and Introduced to Sri Lanka by man; IAS - Invasive alien species*

Conservation Status (National Red List; MoE, 2012): *CR - Critically Endangered; EN - Endangered; VU - Vulnerable (all above three categories are considered "Threatened"); NT - Near Threatened; NE - Not Evaluated (e.g. Winter visitors, etc.); DD - Data Deficient*

Recorded from: *Project Site - within the proposed boundary; Periphery - in the immediate peripheral area of the proposed site; Outside - recorded from the SUSL premises but further away from the project site*

Interpretation of the results on flora

Among the plant species recorder during the study, *Cinnamomum citriodorum, Osbekia octandra* and *Gaertnera walkeri* were found as endemic species. All the other species were native apart from *Clidemia hirta*, which was found as introduced invasive species.
The highest Shannon diversity value was shown by the Shrubs and Herbs, while the lowest value was shown by the Orchids. However the main targeted floral group i.e. trees with more than 10cm dbh have shown intermediate Shannon Diversity Index value. According to the Simpson's Index, Ferns are more dominated in the area than the shrubs and herbs (Table 7).
When such plants are concerned, although the project site harbours a considerably high diversity none of the species are of any significant concern of being severely affected by the project. Because, similar specimens have also been recorded from the nearby forest reserves.
Considering the Medicinal values of these floral species, the tree *Symplocos cochinchinensis* (Bombu), and herb *Clidemia hirta* (Kata kalu bovitiya) has considerably higher medicinal value when compared with the other recorded species. Many of the other higher plants and some of the herbs reported during the survey also have traditional medicinal values (Table 7 & Table 8). However, there is no any evidence that people living near by the university have been using such plant species for their medicinal requirements.

Interpretation of the results on fauna

Land snails: Among the land snails recorded during the study, two Sri Lankan endemic and endangered species i.e. Itier's Operculate Snail (*Aulopoma itieri*) and Sphaeroid's Operculate Snail (*Aulopoma sphaeroidium*) are of high conservation significance. Two other endemic land snail species threatened at vulnerable category were also recorded from the project site i.e. Sri Lanka Ratnadeepa Snail (*Ratnadvipia irradians*) and the three-banded Beddomea Snail (*Beddomea trifasciatus*). Further, an undescribed species of possibly endemic Lucid Satiella Snail (*Satiella* sp.) is of concern. Nevertheless, none of these species are range restricted with emphasis to the project area, while being distributed throughout the area in closed canopy natural forests also showing distributions beyond the Eastern Intermediate Zone, towards the south-western Wet Zone while *Beddomea trifasciatus* extends to the central mountains as well (S.J. Perera, *pers. obs.* 2015-2018). Two *Glessula* species recorded from the study area belongs to the data deficient category due to taxonomic uncertainties. Nevertheless, they also show well established populations distributed in surrounding forests and reserves. On the other hand, the records of the invasive alien Giant African Snail (*Lissachatina fulica*) and the introduced Macro Lucid Snail (*Macrochlamys indica*) indicates higher levels of human disturbance in the study area, especially along its northern limits where both above species have established populations (only in Transect A).

Odontes and Butterflies: No critical species of dragonflies or damselflies were recorded from the project site during the survey. When butterflies are concerned, although the project site harbours a high diversity none of the species are of any significant concern of being severely affected by the project. Among the two endemic species the Common Birdwing (*Troides darsius*) shows a widespread distribution and hence listed as a Least Concern species in the red list, while the Sri Lankan Hedge Hopper (*Baracus vittatus*) is categorised as vulnerable. Nevertheless, both *Baracus vittatus*and another vulnerable species recorded from the study site, Conjoined Swift (*Pelopidas conjuncta*) show considerable populations being locally common. Further, two near threatened species have also been recorded from the study site i.e. Double banded Crow (*Euploea sylvester*) and the Dark Evening Brown (*Melanitis phedima*). Nevertheless their status of widespread distribution indicates this project will not contribute to downgrade their conservation status.

Herpetofauna: Among the low diversity of amphibians recorded from the site the endemic, common shrub frog (*Pseudophilautus popularis*) is listed as Near Threatened. But the species being among the most widespread shrub frogs in Sri Lanka, the impact of the proposed development would be minimal on its population. Further, a possibly undescribed species of a *Pseudophilautus* shrub frog was also been recorded during the study, that has also been recorded from other forested areas in the region (Perera, S.J. *pers. obs.* 2017-2018).

A snake species of conservation concern, the near threatened green keelback (*Macropisthodon plumbicolor*) listed here was recorded from outside the project site. Hence the project would not impose a new threat to the survival of these two species. Nevertheless, a more important species of an undescribed skink belonging to the endemic genus *Lankascincus* was recorded from the leaf litter of forest floor near the south-western edge of the project site. This record urges a special attention on the critical population of these lizards within the forest patch to be partly cleared for the proposed construction, although similar specimens have also been recorded from the nearby forest reserves (Perera, S.J. *pers. obs.*
2017-2018).

Avi Fauna : Among the birds recorded from the site the only near threatened species, the Spot-bellied Eagle Owl (*Bubo nipalensis*) is a widespread species, which would not be affected by the proposed construction as the recorded specimen flying above the site do not have a direct ecological necessity from the site to be cleared. Nevertheless, a population of Indian Nightjars (at least 3-4 individuals) were repeatedly recorded to use the forest floor closer to the southern boundary of the project area as their day roosting habitat. Hence, although the species is listed in Least Concern category the importance of the site for their ecological requirement should be maintained, with a minimum disturbance to the forest patch situated south of the project site.

All the species of mammals with conservation concern listed here (Fishing cat - *Prionailurus viverrinus*, Barking deer - *Muntiacus muntjak*, Stripe-necked mongoose - *Prionailurus viverrinus*, and the Indian pipistrelle - *Pipistrellus coromandra*) were recorded from the areas outside the project site, hence will not be affected by the development as they are of higher dispersal ability and found in considerably large populations like in the case of birds above.

People and Biodiversity

Considering the project area and the surrounding periphery provide different provisioning and supporting services including the water and air purification and maintenance of the microclimate and soil productivity, as well as provide raw materials such as medicines, firewood etc. for the villagers for different purposes. Moreover the cultural services are another set of services provided by the area. It mainly includes recreational value for the entire area and good source for the science and education purposes.

Illegal harvesting of Walla Patta is the only threaten for the flora in the proposed area. Further, poaching is happening and human maintained populations of feral dogs and cats are a great threat to mammals like the balck-naped hair and the barking deer as well as the small mammals and herpetofauna.

Impacts Identification

Impacts can be categorised as direct and indirect. Two lists of noticeable direct and indirect impacts are given below.

Direct impacts

Habitat loss
Habitat deterioration in the neighbouring area
Spread of Invasive Alien Species (IAS)
Loss of scenic beauty Soil
erosion etc.

Indirect impacts
Loss of biodiversity
Increase the risk of extinction
Increase land degradation etc.

Conclusion
The rapid assessment on the biodiversity in proposed site for the development of the Faculty of Technology of the SUSL has revealed moderate levels of species richness in selected floral and faunal taxa. Further the proportions of endemic and/or threatened species in the project site and its periphery are not of critical levels. Most of such species even when listed have been recorded from outside the area of direct impact from the project. Therefore, the study supports the argument that the area which is proposed to construct the new building complex of the Faculty of Technology, SUSL currently harbours a natural forest patch with moderate significance on ecological value in terms of floral and faunal diversity.

Therefore, based on the findings elaborated above, especially as indicated by species diversity indices, the proposed project is not intended to have a major significant impact on the biodiversity and ecology of the immediate impact zone of the project. The relevant officials related to protected areas are also consulted, and no permit is required.

Recommendations
As elaborated in the discussion on critical species/populations, the natural forested area beyond the southern end of the project site, especially towards the south-east has been identified to harbour several important components of the biodiversity, especially of the animal groups with less dispersal abilities as well as for the shade loving endemic/native plant species and some epiphytic plant species. Hence, it is proposed to maintain a forest patch equal in areas to the forest extent loss due to the project, within the university premises.

Although it is not envisaged that the proposed project have any significant long term negative impacts on the ecological environment of the project area, there will be many short term impacts during the construction period of the project. Hence, it is strongly recommended all such undesirable impacts should be minimized through eco-friendly design concepts in planning and incorporating of good engineering practices during construction phase. It is urged to introduce ecologically sensitive best practices during operational phase of the project, especially as the project site is adjacent to a healthy forest patch which will be maintained as it is in the future with some critical biodiversity it harbours.

Recommended tools for the conservation of biological resources in the project area
It is suggested to conduct and continue a long term biodiversity monitoring program in natural habitats left naturally within the proposed site/university premises with the support of the Society of Natural Resources Studies (SNRS) under the guidance of the Department of the Natural Resources, Faculty of Applied Sciences, Sabaragamuwa University of Sri Lanka.

For the habitat enrichment process, light demanding plant species such as *Macaranga peltata*, *Alstonia* sp. etc can be introduced for the newly opened areas. As a second step, more shade

loving plant species such as *Cinnamomum citriodorum*, *Syzygium zeylanicum* etc. can be introduced. Many of the species given in the Table 5 and Table are more suitable for the habitat enrichment process.
Demarcate a Biodiversity conservation area
Suggest a method of biodiversity in impact prediction during the project and mitigation measures and monitoring plans under recommendation

Monitoring plan
Habitat enrichment activities have to be carried out within the proposed project site area and also students and workers will be made aware on the protection status of the species found in the proposed area.

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Annex I

Abundance data available for the faunal survey (only for taxa recorded with systematic sampling)

ABUNDANCE DATA FOR BIRD TRANSECTS

	Sample	Transect 1	Transect 2	Transect 3	Transect 4	Transect 5	Transect 6
	Date/year	5/5/2018	5/5/2018	5/5/2018	5/6/2018	5/6/2018	5/6/2018
	Time	06:45-07:15	06:45-07:15	15:30-14:00	06:45-07:15	09:45-10:15	15:15-15:45
Acridotheres tristis	Common Myna	0	0	0	1	0	0
Aegithina tiphia	Common Iora	3	0	0	0	0	2
Centropus sinensis	Greater Coucal	1	0	0	0	0	0
Chalcophaps indica	Emerald Dove	1	0	0	0	0	0
Chloropsis jerdoni	Blue-winged Leafbird	0	0	0	4	0	0
Collocalia unicolor	Indian Swiftlet	4	0	0	0	0	0
Copsychus malabaricus	White-rumped Shama	0	0	0	0	0	1
Coracina melanoptera	Black-headed Cuckooshrike	1	0	0	0	0	0
Corvus levaillantii	Large-billed Crow	1	0	0	0	3	0
Cypsiurus balasiensis	Asian Palm Swift	0	0	0	2	1	0
Dicaeum erythrorhynchos	Pale-billed Flowerpecker	2	1	0	0	3	0
Dicrurus caerulescens	White-bellied Drongo	1	0	0	0	0	0
Dinopium psarodes	Sri Lanka Lesser Flameback	0	0	0	0	0	1
Ducula aenea	Green Imperial Pigeon	0	0	1	0	0	0
Eudynamys scolopacea	Asian Koel	1	0	0	0	0	0
Gallus lafayetii	Sri Lanka Junglefowl	2	0	0	0	0	1
Gracula religiosa	Hill Myna	0	0	0	2	0	0
Hypothymis azurea	Black-naped Monarch	0	0	0	2	0	0
Lonchura punctulata	Scaly-breasted Munia	3	0	0	0	0	0
Megalaima zeylanica	Brown-headed Barbet	1	1	0	2	0	0
Nectarina asiatica	Purple Sunbird	0	0	1	0	0	0
Nectarina lotenia	Loten's Sunbird	1	0	0	2	1	0
Nectarina zeylonica	Purple-rumped Sunbird	2	0	2	0	1	0
Oriolus xanthornus	Black-hooded Oriole	1	1	0	4	0	0
Orthotomus sutorius	Common Tailorbird	0	0	0	1	0	0
Pellorneum fuscocapillum	Sri Lanka Brown-capped Babbler	0	0	0	1	0	0
Pericrocotus cinnamomeus	Small Minivet	1	0	0	0	0	0
Pericrocotus flammeus	Scarlet Minivet	0	0	0	0	1	0
Psittacula krameri	Rose-ringed Parakeet	0	0	0	2	0	1

Annex II

ABUNDANCE DATA FOR AMPHIBIAN TRANSECTS

	Sample	Transect 1	Transect 2	Transect 3	Transect 4	Transect 5
	Date/year	5/4/2018	5/5/2018	5/6/2018	5/6/2018	5/6/2018
	Time	19:30-20:00	19:30-20:00	20:00-20:30	20:30-21:00	21:00-21:30
Duttaphrynus melanostictus	Common house toad	4	2	0	0	4
Euphlyctis cyanophlyctis	Skipper frog	3	0	0	0	0
Fejervarya cf. limnocharis	Common paddy field frog	0	2	0	0	2
Pseudophilautus popularis	Common shrub frog	0	4	0	0	0
Pseudophilautus sp	Shrub frog species	0	0	0	0	1

Annex III

ABUNDANCE DATA FOR BUTTERFLY TRANSECTS

	Sample	Transect 1	Transect 2	Transect 3	Transect 4	Transect 5
	Date/year	5/5/2018	5/6/2018	5/6/2018	5/6/2018	5/6/2018
	Time	13:30	9:45	10:00	10:20	10:50
Baracus vittatus	Sri Lankan Hedge Hopper	0	1	0	0	0
Castalius rosimon	Common Pierrot	1	0	0	0	0
Catopsilia pomona	Lemon Emigrant	3	0	0	0	1
Cepora nerissa	Common Gull	2	0	0	0	0
Charaxes athamas	Nawab	1	0	0	0	0
Euploea core	Common Indian Crow	3	2	1	1	4
Eurema blanda	Three-spot Grass	2	0	0	0	0
	Yellow					
Graphium sarpedon	Common Bluebottle	1	0	1	0	0
Jamides celeno	Common Cerulean	4	3	0	0	0
Lacura atymnus	Yamfly	0	0	0	1	0
Mycalesis subdita	Common Bush Brown	0	1	0	0	0
Pachliopta aristolochiae	Common Rose	0	0	2	0	0
Papilio clytia	Mime	0	0	1	0	0
Papilio polymnestor	Blue Mormon	1	0	0	0	0
Parantica aglea	Glassy Tiger	2	0	0	0	1
Pelopidas conjuncta	Conjoined Swift	1	0	0	0	0
Prosotas nora	Common Lineblue	3	1	0	0	0
Taractrocera maevius	Common Grass Dart	0	1	0	0	0
Tirumala limniace	Blue Tiger	1	0	0	0	0

Annex IV

ABUNDANCE DATA FOR LAND SANIL TRANSECTS AND PLOTS

	Sample	Transect 1	Transect 2	Plot 1	Plot 2	Plot 3	Plot 4
	Date/year	5/4/2018	5/5/2018	5/5/2018	5/5/2018	5/4/2018	5/5/2018
	Time	19:30-20:00	19:30-20:00	20:15-20:45	21:00-21:30	8:00-8:30	7:45-8:15
Aulopoma itieri	Itier's Operculate Snail	1	1	0	0	0	0
Aulopoma sphaeroidium	Sphaeroid's Operculate Snail	0	0	0	0	1	1
Cryptozona bistrialis	Common Translucent Snail	3	1	0	2	4	3
Glessula sp A	Corkscrew Snail Species (short)	0	0	1	1	3	5
Glessula sp B	Corkscrew Snail Species (long)	0	0	0	0	1	0
Lissachatina fulica	Giant African Snail	6	3	0	0	0	0
Macrochlamys indica	Macro Lucid Snail	1	0	0	0	4	0
Ratnadvipia irradians	Sri Lanka Ratnadeepa Snail	1	3	1	1	3	0
Satiella sp	Lucid Satiella Snail Species	0	1	0	0	2	0

ANNEX 10:
BREAKUP OF FRESH WATER REQUIREMENT DURING CONSTRUCTION

SN	Purpose	Quantity (KL)
1	For of subproject road construction, a) Construction related to earthwork c) Construction of WMM d) Bridges, culverts, retaining walls & other structures	
2	Dust suppression and wheel washes	
3	Ready mixed concrete wagons Site / general cleaning Specialist / high pressure cleaning	
4	For drinking & drinking & another household purpose	
5	Labor camps/Temporary Accommodation Toilets, catering, washing (personnel)	
6	General Site Activities Tool washing Rinsing	

7	Wet Trades ● Brick/blockwork ● Screening ● Concreting ● Plastering ● Core Boring ● Lightweight Roofing ● Ceramic Tile ● Bentonite Mixing ● Rendering	
8	Groundworks ● Grouting ● Drilling/Pilin	
9	Cleaning ● Cleaning Tools and Small Equipment ● Plant and Equipment ● Paintbrush Washing	
SN	**Purpose**	**Quantity (KL)**
1	For road construction and the building a) Construction related to earthwork b) Construction of GSB c) Construction of overhead bridge to connect to the university d) culverts, retaining walls & other structures	
2	Dust suppression	
3	For drinking & drinking & another household purpose	

ANNEX 11:
SUMMARY OF STAKEHOLDER CONSULTATION MEETING

HELD IN SABARAGAMUWA UNIVERSITY OF SRI LANKA
Date: 1 May 2018 Time: 10.30 am - 11.30 a.m
Location: University of Sabaragamuwa University of Sri Lanka

SUSL Invitees: Government officer representatives

- Mr. J.L.C.K. Jayasingha Divisional Secretary, Imbulpe
- Mr. B.M. Samaranayaka Bandara Retired Principal
- Mr. P.V. Punchibandara Retired Principal
- Mr. Palitha Hettigedara School teacher
- Mr. O.G.P. Ovitigama Grama Niladhari, Muththettuwegama

Sabaragamuwa University of Sri Lanka Representatives

- Professor M. Sunil Shantha Vice Chancellor
- Dr. K.R. Koswattage Dean of the Faculty of Technology & Science
- Dr. Naleen Liyanawaduge Senior lecturer
- Dr. Sandun Perera Senior Lecturer
- Dr. P.K.G.S.S. Bandara
- Dr. Jayasingha Senior Lecturer
- Dr. Asanga Ampitiyawatta Coordinator
- D.M.A.P. Jayawardhana PHI in university of Sabaragamuwa

Student Society Representatives

- Mr. Manoj Ranasingha President of Student Union
- Mr. K.A.B.L. Bandara Vice President of Student Union
- Mr. G.Y.M. Udayanga President of Geomatics Faculty Student Union
- Mr. Prasad Wijesingha President of Science Faculty Student Union
- Mr. E.M. Sanjeewa Bandara President of Agriculture Faculty Student Union
- Mr. Swarna Sampath President of Management Faculty Student Union
- Mr. K.D.N. Karunarathna President of Social Science and Language Student Union

Representation from the community

- J.M.M.P.P Bandara
- N.M.D.Hettigedara
- S.J.Bandara

Consultant firm representatives

- Environmental Compliance Consultant ADB – Charmini Kodituwakku
- Safeguard Specialist – Dr Sithara. Atapattu
- Junior Project Manager – Ms. Yasundara Weerasekara

The meeting was attended by 23 stakeholders listed above. We were informed that no invitation letters were sent out to convene the meeting but they were invited through personnel contact. The PHI from Imbulpe Pradeshiya Saba was not invited for the meeting nor any representation was made from the NWRSB, UDA, NBRO, CEA etc.

Matters Presented at the Meeting:

a) Good introduction about the University of Sabaragamuwa with historical context. Purpose of building the FT premises and the befits to the community was explained
b) Brief introduction presentation about the Faculty of Engineering and the proposed Faculty design was provided.
c) Description of importance of the meeting and its scope was addressed
d) Approval requirements for the project were explained
e) Discussion with the Stakeholders.

.

Section (a-b) were presented by Professor Sunil Shantha, Vice Chancellor, University of Sabaragamuwa. Section (c) and (d) Mrs. Charmini Kodituwakku, ADB safeguards consultant. Dr. Sithara Atapattu ADB safeguards consultant also joined giving further insight on the project compliance requirement. Presentations were made in Sinhala.

Method of information dissemination and collection:

- Notes were taken on the discussion
- Discussion took the form of round table discussion
- Discussion were based on adoption of possible migratory measures for environmental issues that were encountered as result of project activities
- Record of the Meeting: General information of the participants such as name, name of the organization along with their signature was recorded during the public consultation meetings and is attached in the report.

The issue that were broadly covered at the meeting include:

- SUSL development of the FT and how it will benefit the surrounding community
- Perception of connectivity of the university to industrial zone and commercial hub
- Perception of national infrastructure that would contribute to the upscale the value of the project
- Checking for the compliance requirements of the project. Procedure to adopt to obtain these compliancy requirements
- Status of soil report and expected submission dates
- Provision of a biodiversity report
- Provision of water supply to the new project site and plans to supply water
- Assessment of the currently existing mechanism for disposal of solid waste and future plans
- Perception of waste water management at the university premises
- Issue of environmental pollution concerning solid and waste water waste disposal and how it will impact on surrounding area.
- Improvement of drainage system associated in the project
- Perception of noise and air pollution as a result of project work

.

Common issues and concerns raised at public consultation meetings

1. Professor M. Sunil Shantha, Vice Chancellor gave an introduction to the proposed project and explained the benefits. He said that the university was one of the major contributors for regional economic growth and development. He added that there is a large village community who depend on the support services provided to the university students and staff. Their services include provision of services such as lodging, communication, transport and food. Additionally, he briefed on the history of the university and how it was

established. He said that originally the building was constructed for the Samanala Wewa Dam project and this was later handed over to the government to establish the Sabaragamuwa University.

2. One of the residents occupying the land adjoining the university, Mr. B.M Samaranayake, pointed out that the university was one of the major resources that bring economic benefits to the community. He pointed out that there were no social or environmental issues associated with the university. He mentioned that as a villager, he expects this expansion will impacts positively to secure livelihood benefits to community.

3. Mrs. Charmini raised the question on whether there has been any progress made on compliances requirement for the project. She asked whether approvals were sought from the Imbulpe Pradeshya Saba, NBRO, CEA etc. In response to this question, Vice Chancellor said they will get the clearances from agencies such as UDA, CEA, Imbulpe Pradeshiysa Saba. They informed that they had not processed these yet.

4. Dr Sithara asked if they were going for Green Building Certification and if so they need to contact UDA. There seemed some confusion on this as they said they will not go for it now but will go for it for the whole University later. There was also some mention on LEAD certification by Dr Kaveenga but this was not confirmed. Then the VC said they will deal with that later. However, Mrs. Charmini informed that green building certificate obtained from UDA would be a viable and that it was not practical to obtain for the whole campus. Mrs. Charmini raised questions on connectivity of Sabaragamuwa with the industrial sector. Addressing this question, VC said that they are well connected with the network of roads and is in close proximity to Hambantota Harbor and Maththala airport. He added that the Sabaragamuwa University of Sri Lanka had industrial consultations with the leading members of the Chamber of Commerce as to how best they could develop the University and the new Faculty. With the proposed future development in the region the Sabaragamuwa FT graduates would have the competitive edge to join the middle level of management in the service sector, logistic services with multidisciplinary skills.

5. The ADB consultant team requested information as to design details of the faculty. In response to this Dr Koswattage responded that they will install solar panels, and natural lighting conditions in the building design. Professor M. Sunil Shantha VC of SUSL pointed out that the project is located in a windy area that can generate renewable energy. He pointed out that they would explore the possibility of harnessing the wind energy for the new faculty.

6. Mrs. Charmini raised the question on how solid waste is being managed at the university premises. VC responded that the CEA had granted 20 million to establish a composting program under “Pilisaru”. He said that they were exploring other possibility such as installing a biogas plant as well as recycling solid waste as an alternative. He further added that Balangoda Urban Council has been identified as the best solid waste recycling center in Sri Lanka.

7. Dr Sithara asked if anyone was using the forest area to obtain medicinal plants. VC said no one enters the area. Also, the local residents said that this area was not used as this was a totally cleared area from the time of Samanala Wewa project and the vegetation is composed of secondary successional species that was established after the University was established.

8. Dr Sithara further questioned if there were any hunting activities in the area even for household consumption. One again it was re-iterated that no one enters the premises and if hunting were required there is so much better forested areas around. A resident said that in the area there have never been hunting issues as far back as he can remember. This was further confirmed by The Grama Nialdhari of the area. He pointed out that majority of the villages engaged in paddy cultivation and hunting was not a common practice among the villagers.

9. Mrs. Charmini asked if there were any social or cultural issues as a result of student unrest or behavior. For this question resident, B. Samaranayake (former principle), pointed out that there wasn't such social unrest. They said that basically the student was the wealth of this village and supported the sustenance of their lively hood.

10. Mrs. Charmini asked from the student represented at the meeting whether they have any difficulties or their view on this project. K.A.D.R. Manoj Ranasinghe (vice president of All Student Union) responded and said that they are very lucky and are awaiting to have the new faculty at their university. They hoped that it will commence soon.

11. PHI in Sabaragamuwa University of Sri Lanka mentioned that there were some issues relating to increase of stray dog population within the university premises. He informed us that with the help of the faculty of veterinary sciences conducted a rabies vaccine programs and surgery programs to control this issue. He pointed out there weren't any issues regarding sanitary facilities and dengue at this site.

12. Mrs. Chamini pointing out that the university needed to obtain relevant approval letters from the relevant authorities as soon as possible. She asked from the District Secretariat of Imbulpe Mr. J.L.C.K. Jayasingha as to the process of clearance that is enforced by the DSD. In response to this he said that CEA, Imbulpe Pradeshya Saba, UDA approval was part of the process. As far as he was concerned the project land was under university ownership and there were no resettlement issues associated with the project. However, he suggested that prior approval from the Impube Pradeshya Saba be obtained prior to the construction of the project.

13. Dr Sithara stressed the need to follow protocol especially since they are sourcing ADB financing. Therefore, she suggested that it would be essential to at least start the process immediately.

14. Meeting was ended with no further matters.


Dr Ampitiyawaththa, Dr Koswatte at the stakeholder


Vice chancellor Sabargamuva University & the facuty of


Representation from the students at from SUSL


Over view of the gathering at the stakeholder meeting


Over view of the gathering with the village community adjoin


Dr Attapatu, Ms Charmini, Yasundara at the stakeholder consutation

KEY INFORMANTS INTERVIEWS

There were four key informant interviews conducted and the information that was gathered is documented below. Mrs Charmini Kodituwakkua contacted these individuals on phone and inquired on the relevant information since they were absent at the stakeholder meeting.

1. Mr. Abitha Vanasundara NBRO: Date contacted was **2nd of June 2018** at 9.00am 0718 627 030

With regard to the question on whether the SUSL new technology faculty location is prone to landslides as there were report of Praviayangala mountain range being identified as one. He stated that they have not properly investigated the project location however there are could be possibilities of infusions. At the time we did not have the SUSL geotechnical report so he abstain from commenting further.

2. Mr Manjua Development Officer **Imbulpe Pradeshya Saba 11th June 2018** at 12.00pm **0452287361**

When questioned details on the solid waste disposal mechanism that exists in Imbulpe Pradeshya Saba Mr Manjula said that they did not receive the solid waste from the PS. The PS had a composting mechanism and that it was being installed. He added that they collect sorted out waste and the inorganic waste such as plastic and polythene was recycled. He requested that I contact the SPHI for further clarification regrding the waste disposal mechanism at the university of Sabragamuwa.

3. **Mr Fernando** Senior public health inspector **Imbulpe Pradeshya Saba 11th June 2018** at 12.20pm contact no 0710139361

When asked whether there were any social or health concerns regarding the university he provide the following information:

Waste Water Disposal: he pointed out that within the student hostels and the university waste water disposal was unregulated. The sewage was taken in university bowsers and emptied into an open cement tank which is not covered and this is a public nuisance for the villagers adjoin the university premises. He adds that the leachate from these stage tanks pollute the environment and the surface and groundwater table. They as the MOH office had receive number of complains and have issues warning to the university to adopt corrective measures. However, he informed that mitigatory measures have not been adopted and that they will have to seek litigation. He suggested that a bio gas plan be installed to treat the waste water and use the treated waste water effluent to irrigate the SUSL garden.

Solid waste disposal; On the issue of solid waste disposal he informed that they were trying to introduce the placing of color coded bind in the university premises like what has been practicing with the belihul oya community. However, university admiration was reluctant to adopt this measure and was giving excuses. They had told that it was difficult to convince the students to adopt these measures since they did not have any notion of social responsibility. Therefore, to date the solid waste is disposed unsorted in to open waste dumps within the university premises. He pointed out that the unregulated disposal of solid waste increases the health risk of the students and community surrounding the SUSL. He pointed out that they should evolve a mechanism to deal with the organic and inorganic solid waste that is generated by the University

Issue of availability of water: When inquired as to water scarcity experienced by the university and record of such instances over the past decade. He pointed out that for the moment it is under control and this has been due to the mismanagement of the water treatment plant that existed during the Samanalawewa project. Until the WASIP water supply project is established water is chlorinated and distributed from the intake point. He said that there were several incidents of hepatitis recorded before due to lack of a treatment facility. He informed that now the situation is under control.

4. Mr S.P.Gamage , District Manager WASIP project **11th June 2018 at 2.00pm** contact no 0452276031

He informed that the WASIp water supply project will supply water for over 7 GN divisions in the area and one of their major supply consumer would be the SUSL. Once the project fully implemented SUSL will not experience any water shortage. At the moment the project has only competed 25% and it will be commissioned by 2019.

Sign Sheets of Stakeholder meeting

1

NEW TECHNOLOGY FACULTY DEVELOPMENT PROJECT IN UNIVERSITY OF SABARAGAMUWA

Venue-

Date: 1st May 2018

#	Name /නම/பெயர்	Designation/ තනතුර/பதவி	Organization/ සමාගම/ நிறுவனம்	Contact No/ දුරකථන අංකය/ தொலைபேசி இல	E-mail/ විද්‍යුත් තැපැල/ மின்னஞ்சல்	Signature/ අත්සන/ கையொப்பம்
01	B.M. [illegible]	[illegible]		071-8c40583		[illegible]
02	S.M.M.D.P [illegible]	[illegible]		0714650920		[illegible]
03	P.V. Punchibandan	pricipal retired		0718061658		[illegible]
04	K.A.D.R. [illegible]	[illegible]	[illegible]	0702085158	sab.studentsunion@gmail.com	[illegible]
05	K.A.B.L. [illegible]	[illegible]	[illegible]	0715425818		[illegible]
06	S.Y.M [illegible]	[illegible]	[illegible]			[illegible]
07	E.M. [illegible]	[illegible]	[illegible]			[illegible]
08	[illegible]	[illegible]	[illegible]			[illegible]

2

NEW TECHNOLOGY FACULTY DEVELOPMENT PROJECT IN UNIVERSITY OF SABARAGAMUWA

Venue-

Date: 1st May 2018

#	Name /නම/பெயர்	Designation/ තනතුර/பதவி	Organization/ සමාගම/ நிறுவனம்	Contact No/ දුරකථන අංකය/ தொலைபேசி இல	E-mail/ විද්‍යුත් තැපැල/ மின்னஞ்சல்	Signature/ අත්සන/ கையொப்பம்
09	[illegible]	[illegible]	[illegible]			[illegible]
10	K.D.N. [illegible]	[illegible]	[illegible]			[illegible]
11	DMAP [illegible]	[illegible]	[illegible]			[illegible]
12	Dr. [illegible]	[illegible]	[illegible]	[illegible]		[illegible]
13	Dr. [illegible]	[illegible]	[illegible]			[illegible]
14	Dr. K.R. [illegible]	[illegible]	[illegible]	077 944 2935		[illegible]
15	Dr. P.K.G.S.S. [illegible]	[illegible]	[illegible]			[illegible]
16	Dr. [illegible]	Coordinator	Faculty Technology	0715346980		[illegible]

3

NEW TECHNOLOGY FACULTY DEVELOPMENT PROJECT IN UNIVERSITY OF SABARAGAMUWA

Venue- **Date: 1st May 2018**

#	Name /නම/பெயர்	Designation/ තනතුර/பதவி	Organization/ සමාගම/ நிறுவனம்	Contact No/ දුරකථන අංකය/ தொலைபேசி இல	E-mail/ විද්‍යුත් තැපැල/ மின்னஞ்சல்	Signature/ අත්සන/ கையொப்பம்
17	Prof. M. Sunil Shantha	Vice Chancellor	Sabaragamuwa University	0714468755	vc@sab.ac.lk	[signature]
18	O.G.P. Ovitigama	Grama Niladhari	Muttettuwegama	0771993268		[signature]
19	S. M. J. Bandara	J. P.	Muttettuwegama	0777419619	-	[signature]
20	N.M. Palitha Hettigedara	Teacher	Muththettuwegama Vidyalaya	0718582995	-	[signature]
21	D. [illegible]	senior Lecturer	Muththettuwegama	0714453459	dul@susl.lk	[signature]
22	N M D [illegible]	[illegible]	-	045 2280084		[signature]
23	J.L.C.K. Jayasinghe	Divisional Secretary	Imbulpe	0711091797	Jlckjayasinghe@gmail.com	[signature]
24	Charmini Kodituwakku	Env: Complenice Specialist	TMS/ADB	0713664844	charminik@gmail.com	C. Kodituwakku

4

NEW TECHNOLOGY FACULTY DEVELOPMENT PROJECT IN UNIVERSITY OF SABARAGAMUWA

Venue- **Date: 1st May 2018**

#	Name /නම/பெயர்	Designation/ තනතුර/பதவி	Organization/ සමාගම/ நிறுவனம்	Contact No/ දුරකථන අංකය/ தொலைபேசி இல	E-mail/ විද්‍යුත් තැපැල/ மின்னஞ்சல்	Signature/ අත්සන/ கையொப்பம்
25	Sithara Atapattu		TMS			
26						
27						
28						
29						
30						
31						
32						

ANNEX 12: COMPLAINS FORM

Sample Grievance Registration Form (To be available in Sinhala and English)

The _____Project welcomes complaints, suggestions, queries, and comments regarding project implementation. We encourage persons with grievance to provide their name and contact information to enable us to get in touch with you for clarification and feedback.
Should you choose to include your personal details but want that information to remain confidential, please inform us by writing/typing *(CONFIDENTIAL)* above your name. Thank you.

Date	Place of registration	Project Town Project		
Contact information/personal details				
Name	Gender	* Male *Female	Age	
Home address				
Place				
Phone no.				
E-mail				
Complaint/suggestion/comment/question Please provide the details (who, what, where, and how) of your grievance below: If included as attachment/note/letter, please tick here:				
How do you want us to reach you for feedback or update on your comment/grievance?				

FOR OFFICIAL USE ONLY

Registered by: (Name of official registering grievance)		
Mode of communication: Note/letter E-mail Verbal/telephonic		
Reviewed by: (Names/positions of officials reviewing grievance)		
Action taken:		
Whether action taken disclosed:	Yes No	
Means of disclosure:		

ANNEX 13: TERMS OF REFERENCE FOR ENVIRONMENT SAFEGUARDS CONSULTANT

Project	SRI 50275-002: Science and Technology Human Resource Development Project
Professional Group	C
Job Level	5
Expertise	Environmental Management
Expertise Group	Environmental Science, Environmental Management, Natural Resource Management
Source	National/International

OBJECTIVE AND PURPOSE OF THE ASSIGNMENT

The Science and Technology Human Resource Development Project in Sri Lanka is being proposed for Board approval in September 2018. During implementation, technical support is required in ensuring safeguards policy compliance in preparing environmental monitoring reports for the 4 universities. The Environmental Safeguards Specialist will provide support in ensuring that the Project complies with ADB's Safeguards Policy Statement, 2009 (SPS) for environmental safeguards, and national laws and regulations.

SCOPE OF WORK

During implementation, the Specialist will support executing and implementing agencies (EA/IAs) and their project implementation units (PIUs) in preparing environmental monitoring reports in accordance with categorization based on SPS. The Specialist will review compliance with IEE and its EMP with ADB's Safeguards Policy Statement, 2009 (SPS) for environment safeguards and national laws and regulations. The Specialist will guide the EA/IAs in incorporating the EMP, IEE, and relevant environmental clauses in bidding documents.

The Specialist will monitor EMP implementation ensuring compliance with SPS; loan agreement; and national laws and regulations. The Specialist will guide EAs/IAs in conducting monitoring, conduct verification of monitoring reports—and provide reviewed reports to ADB. The Specialist will revise the monitoring reports, as necessary. Based on the Project Administration Manual, monitoring will be done on a semiannual basis during construction phase and annually during construction phase.

DETAILED TASKS AND/OR EXPECTED OUTPUT

The Specialist will carry out the following tasks:

1. Conduct tailored capacity building training sessions on environmental safeguard for PIUs, university staff and contractors and prepare guides/forms/training proceedings to ensure EA/IAs comply with the SPS, and national laws and regulations. Documentation will be included in monitoring reports.
2. Guide the EA/IAs in updating existing IEEs: based on detailed design and/or due to any change in design, location, alignment, unanticipated impact/s identified during project implementation) as required, including leading its preparation in the initial stages of project implementation to ensure that EA/IAs are compliant with the PAM, SPS, loan agreement, and national laws and regulations.
3. Guide EA/IAs and ensure that environmental safeguards are incorporated in bidding documents in accordance with the loan agreement and SPS.
4. Guide the EA/IAs in determining compliance with the loan agreement with regard to

ensuring contracts and contract award. The Specialist will devise a checklist for EAs/IAs and their PIUs to ensure subprojects comply. The documentation will be included in monitoring reports.

5. The Specialist will conduct field visits for subproject sites/locations verification, discussions with PIUs, technical experts, design and supervision consultant, other consultants, and/or design engineers.
6. The Specialist will guide EA/IAs and their consultants in conducting monitoring, conduct verification of monitoring reports—and provide reviewed reports to ADB. The Specialist should ensure that monitoring reports provide detailed information, flag non-compliance including any safeguards related grievances, and recommend corrective actions agreed by the EA/IAs.
7. Prepare environmental awareness materials and organize environmental awareness workshop/training for EAs/ contractor/community.
8. Perform other activities as required by ADB, EA/IAs on mutually-agreed arrangements.

Reporting

The Specialist will report directly to the ADB in RM/HQ counterpart. The consultant will provide direct support to relevant EA/IAs and their PIUs, including design and supervision consultants. Overall framework and direction will be provided by the ADB project officer in consultation with the EA/IAs, PIUs, and other government officials. The Specialist is expected to perform independently and take initiatives to inform or consult with the ADB project officer on problem areas and major constraints, and ways forward to achieve intended objectives of the assignment.

Minimum Qualification Requirements

Master's degree in Environmental Management, Natural Resources Management, Engineering, or related field with at least 10 years' experience in environmental safeguards, particularly preparation of Initial Environmental Examination (IEE) and Environmental Management Plan (EMP). Good understanding of ADB and Sri Lanka's environmental policies and legislation. Past experience in safeguards work with ADB or World Bank projects preferable. Experience on environmental management of education projects will add value.

Minimum General Experience: 15 Years
Minimum Specific Experience: 10 Years (relevant to assignment)
Regional/Country Experience: Required

Deliverables

The Specialist will provide ADB with the following documents:

1. Inception Report and Timebound Work Plan;
2. Updated IEEs, as necessary;
3. Environmental awareness materials;
4. Verified monitoring reports; and
5. Training plan and training materials.

ANNEX 14: AUDITOR GENERAL'S REPORT

Sabaragamuwa University of Sri Lanka – 2016

The audit of financial statements of the Sabaragamuwa University of Sri Lanka for the year ended 31 December 2016 comprising the statement of financial position as at 31 December 2016 and the statement of financial performance, statement of changes in equity and cash flow statement for the year then ended and a summary of significant accounting policies and other explanatory information, was carried out under my direction in pursuance of provisions in Article 154(1) of the Constitution of the Democratic Socialist Republic of Sri Lanka read in conjunction with Sub-section 107(5) of the Universities Act No.16 of 1978. My comments and observations which I consider should be published with the Annual Report of the University in terms of Sub-section 108(1) of the Universities Act appear in this report. A detailed report in terms of Sub-section 108(2) of the Universities Act was furnished to the Vice Chancellor of the University on 26 July 2017.

1.2 Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair preparation of these financial statements in accordance with Sri Lanka Public Sector Accounting Standards and for such internal control as the management determines is necessary to enable the preparation of financial statements that are free from material misstatements whether due to fraud or error.

1.3 Auditor's Responsibility

My responsibility is to express an opinion on these statements based in my audit. I conducted my audit in accordance with Sri Lanka Auditing Standards consistent with International Auditing Standards of Supreme Audit Institutions (ISSAI 1000-1810). Those Standards require that I comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatements.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgement, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the University's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the University's Internal Control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of financial statements. Section 111 of the Universities Act, No.16 of 1978 give discretionary powers to the Auditor General to determine the scope and extent of the audit.

I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my audit opinion.

1.4 Basis for Qualified Opinion

My opinion is qualified based on the matters described in paragraph 2.2 of this report.

2. Financial Statements

2.1 Qualified Opinion

In my opinion, except for the effects of the matters described 2.2 of this report, the financial statements give a true and fair view of the financial position of the Sabaragamuwa University of Sri Lanka as at 31 December 2016 and its financial performance and cash flows for the year then ended in accordance with Sri Lanka Public Sector Accounting Standards.

2.2 Comments on Financial Statements

2.2.1 Sri Lanka Public Sector Accounting Standards

Sri Lanka Public Sector Accounting Standard 02

The following observations are made.

(a.) A sum of Rs.2,625,798 received in cash during the year under review as interest income had been shown as Rs.8,042,860 under the investment income in the cash flow statement and as a result the cash generated from the investment activities had been overstated by a sum of Rs.5,417,062. Thus the balances of this cash flow statement has become a problematic situation in audit.

(b.) The payment of interest on the lease installments of the year under review amounting to Rs.2,244,287 had not been shown under the financial activities of the cash flow statement.

(c.) In terms of paragraph 31 of the Standard, the cash receipts and the cash payments relating to the investment and financial activities should be shown separately in the financial statements. Nevertheless, the cash receipts and cash payments relating to 12 Fund Accounts had been set-off and the balance had been shown under the financial activities as debit and credit balances amounting to Rs.2,991,521 and Rs.1,096,129 respectively.

(d.) A sum of Rs.151,377,090 paid for the purchase of property, plant and equipment and a sum of Rs.59,596,728 paid for the work-in-progress during the year under review had been shown under the investment activities as Rs.152,930,989 and Rs.62,510,486 respectively. As such the cash flows had been overstated by a sum of Rs.4,467,657.

2.2.2 Accounting Deficiencies

A sum of Rs.334,750 paid as personal emoluments in respect of the preceding year of the Open and Distant Education Centre had been brought to account as an expenditure of the year under review and as such the surplus for the year under review had been overstated by that amount.

2.2.3 Lack of Evidence for Audit

The evidence indicated against the following items of account had not been produced to the Audit for the confirmation of those items of account.

Item of Account	Value	Evidence not made available
	Rs.	
Lands	54,196,566	Title Certificates/ Vesting Orders
Buildings	2,438,155,680	Registers of Fixed Assets
Water Purifying Units	9,113,148	
Office and Teaching Equipment	558,074,191	
Library Books and Periodicals	131,210,743	
Motor Vehicles	119,177,290	
Communication Equipment	32,278,766	
Degree Cloaks	3,149,512	
Other Equipment	143,627,756	
Computer Accessories	267,481,996	
Stocks written-off from books	54,032	Detailed Schedules
Total	3,756,519,680	

2.3 Accounts Receivable and Payable

(a.) A sum of Rs.373,329 receivable from 10 employees relating to 19 loan balances existing over periods ranging from 01 year to 17 years had not been recovered.

(b.) Action had not been taken to settle the employees loan adjustments amounting to Rs.77,900 brought forward from the year 2010.

(c.) The courses of action required to be taken for the recovery of the sundry debtors balances amounting to Rs.105,525 existing from the periods prior to the year 2003 had not been taken.

(d.) The sundry deposits amounting to Rs.358,897 receivable from the external parties existing from the year 2012 had not been recovered.

2.4 Non-compliance with Laws, Rules, Regulations and Management Decisions

The following non-compliances were observed during the course of audit.

	Reference to Laws, Rules, Regulations, etc.	Non-compliance
(a.)	Section 122(1) of the Universities Act No.16 of 1978	Even though the Council of Students Consisting of the Students representatives selected from among the persons who remained as students of the University for the time being should be established, the Student Councils had not been made functional due to the failure to appoint even by June 2017 the Senior Treasurers to the Students Councils of 05 Faculties, the periods of which had expired in April 2016.

(b.)	Financial Regulations of the Democratic Socialist Republic of Sri Lanka Financial Regulation 571 (1), (2) and (3)		The necessary courses of action had not been taken to carry out an age analysis of the deposits, retention money and bid securities totalling Rs.15,100,847 existing from the year 2011 to the year 2015 and settle the lapsed deposits.
(c.)	Establishments Code for the University Grants Commission and Institutions of Higher Education		
	(i.) Section 7.6 of Chapter V	-	The liquidated damages amounting to Rs.60,346,783 recoverable from 15 officers who had proceeded abroad on study leave during the period from the year 2000 to the year 2016 and failed to report back to service had not been recovered.
	(ii.)Section 3.1 of Chapter XX	-	A sum of the Rs.468,595,919 had been paid in the year under review as the salaries and allowances of 259 members of the Academic Staff for the year under review without obtaining confirmation of their times of Arrival and Departure.
(d.)	Section 7.2 of the Public Enterprises Circular No.PED/12 of 02 June 2003	-	The Operating Hand books covering all operating areas of the University had not been prepared.

3. Financial Review

3.1 Financial Results

According to the financial statements presented, the financial results of the University for the year 2016 amounted to a surplus of Rs.39,224,605 as against the deficit for the preceding year amounting to Rs 22,927,315 and as such the financial results for year 2016 as compared with the year 2015 indicated an improvement of Rs.62,151,920. The increase of the Government recurrent grants by a sum of Rs.127,391,842 and the other income by a sum of Rs.11,118,033 had been the main reason for the above improvement.

An analysis of the financial results for the year under review and 04 preceding years indicated that the deficit of Rs.96,632,028 for the year 2012 had decreased to Rs.22,927,315 by the year 2015 with fluctuations. Nevertheless, that had improved to a surplus of Rs.39,224,605 by the year 2016. Nevertheless, with the readjustment of the employees' remunerations and the depreciation on the non-current assets to the financial results the contribution of Rs.395,954,737 in the year 2012 had continuously improved to Rs.1,066,638,982 by the year 2016.

4. Operating Review

4.1 Performances

According to Section 28 of the Universities Act, No.16 of 1978, the enrolment of students, the conduct of examinations for the determination of the persons who had achieved proficiency in different academic areas, functioning in co-operation with the other Universities in Sri Lanka and in foreign countries, the conduct of Postgraduate Degree Courses, the conduct of Postgraduate Degrees to those who have passed the examinations, the conduct of External Examination with the concurrence of the Commission and the award of Degrees to the persons who have passed those examinations are the major functions and duties of the University.

The following observations are made in this connection.

(a.) Registration of Internal Students to the University

Even though the number of students proposed for registration in the three preceding Academic Years had been 3,356, out of that 3,176 students only had been registered and as such there were vacancies of 380 students or 11 per cent of the number of students proposed for registration.

(b.) Registration of Students for the Bachelor of Arts (External) Degree Course

The following observations are made.

(i.) According to the Commission Circular No.932 dated 15 October 2010 of the University Grants Commission, the above course should have been modernised and commenced after the year 2011. Even though 05 years had elapsed after the issue of the above circular, action had not been taken for the modernization of the Course and enroll new students even by 31 May 2017.

(ii.) Even though a period exceeding 05 years had elapsed after the last enrolment of students to the above course in the year 2011, the third year examination for that group had not been conducted even by 31 May 2017. In view of this situation, out of 185 students registered for this course in that year, 125 students or 66 per cent had abandoned the course as at present.

(c.) Out of 79 students registered for the Academic Year 2014/2015 of the Department of Animal Production of the Faculty of Agricultural Science, 76, 15 and 11 students respectively had not qualified for the First Semester Examination in 03 subjects, namely Genetics Science, the Bio-Chemistry Science and Food Science and the Technology Principles. The necessary courses of action had not been taken to ascertain the reasons for the existence of such situation and for rectification.

(d.) Even though 2,319 students out of 2,708 students registered in the 03 preceding years had completed the Degree, 14 per cent of the students registered had failed in those Academic years to complete the Degree.

4.2 Management Activities

Instead of preparing a suitable course of action in collaboration with the 03 Local Authority of the area in connection was the management of about 02 tons of Waste generated by the University daily, such waste had been disposed of with effect from January 2015 to the Nonpareil Land without separating the waste as degradable waste and non-degradable waste. Such waste had spread to different places in the area and as such the possibility of creating environmental pollution as well as adverse conditions to the wildlife was observed.

4.3 Operating Activities

The following activities are made.

(a.) Even though University had been using the Water Purification Plant with the capacity for providing the daily needs of water for 1,500 persons constructed in the year 1986 for the Samanala Wewa Reservoir Scheme, the water purification system of the Water Purification Plant had become inactive since August 2015.In such circumstances, the water from Hirikatu Oya had been obtained direct to the tank and distributed by mixing with chlorine. According to the reports of the monthly tests of the presence of bacteria in the water carried out by the institution revealed that the water does not conform to the specific quality. As such the supply pure water fit for drinking water to about 7,300 students and the staff of the University had become a problem.

(b.) Action had not been taken even by May 2017 to complete the construction of the tube well partly constructed at a cost of Rs.1,050,196 near the Women's Hostel in the year 2014 for fulfilling the water requirement of the University.

4.4 Underutilization of Funds

The balance of Rs.7,930,105 of 05 Funds of University had been idling over periods ranging from 02 years to 06 years without being utilized for specific objectives.

4.5 Idle and Underutilized Assets

The following observations are made.

(a.) The Lecture Hall situated in the Farm of the Faculty of Agricultural Science constructed in the year 2014 at a cost of Rs.6,720,833 outside the Master Plan of the University and without carrying out a feasibility study with the expectation of enrolling additional students had been idling without being utilized.

(b.) Even though the Higher Education for Twenty First Century Project had given goods and equipment valued at Rs.2,725,000 to the University in the year 2016 for the establishment of the Out-Bound Training Centre of the Faculty of Applied Sciences of the University such equipment had been underutilized even by 31 May 2017 as the Infrastructure Facilities and Plans for that purpose had not been prepared.

(c.) The Sports Goods, Office Equipment and Library Books valued at Rs.1,262,584 given to the University in the years 2013, 2014,2015 and 2016 by the Higher Education for Twenty First Century Project had been stored in the Operating Technical Services Centre closed down at present, even by May 2017 without being utilized.

4.6 Uneconomic Transactions

Even though the Cabinet of Ministers had, by the decision dated 24 August 2005, granted the approval for the construction of an Information Technology Building at a cost of Rs.121 Million the approval for that had been granted again in the year 2007. The decision for the construction had been changed after spending a sum of Rs.1,819,966 in the year 2010 for the preparation of building designs and commencement of work. As such the expenditure had become fruitless.

4.7 Procurement and Contract Process

The following observations are made.

(a.) The Stadium and the Pavilion of the University constructed in the year 2014 at a cost of Rs.123,052,693 had not been constructed in a manner fit for sports and as such rain water collected was not flowing out. The development of the surface of the stadium with gravel mixed earth had resulted in a hard surface and due to that reason and the lack of maintenance had resulted in the inability for the Students use it for sports activities. The cracked retaining wall near the pavilion had not been repaired. The necessary courses of action had not been taken even by May 2017 to repair the stadium by utilizing the retention money amounting to Rs.5,156,160.

(b.) In the preparation of the cost estimate of Rs.945,789 for inviting bids for the construction of the drain near the staff canteen, rates with adjustments for the current prices had been used. Accordingly as compared with the rates of the Sabaragamuwa Provincial Council an excess estimate of Rs.91,346 had been made.

4.8 Staff Administration

The following observations are made.

(a.) There were 36 vacancies in the Academic Staff as at 31 December of the year under review comprising 04 vacancies in the posts of Professors and 32 vacancies in the posts of Lecturers. In view of the failure to take action for filling those vacancies even by June 2017, a sum of Rs.19,437,369 had to be paid to 106 Visiting Lecturers during the year under review. Excesses in the Academic posts consisting of post of Assistant Professor, 07 posts of Lecturers, 13 posts of Temporary Demonstrators/ Instructors and 18 Consultants were also observed.

(b.) There were 114 vacancies consisting of one post of Administrator, 02 posts of Library Officers 31 posts in the Academic Assistant Staff and 80 posts in non-academic posts as at 31 December of the year under review. Action had not been taken even by June 2017 to fill those vacancies and as such a sum of Rs.16,811,999 had to be paid as holiday pay and overtime during the year under review.

5. Accountability and Good Governance

5.1 Corporate Plan

Even though a Strategic Management Committee had been established for the measurement of the physical progress of the Corporate Plan, that Committee had not reviewed 117 activities out of 150 activities of the plant even by May 2017.

5.2 Action Plan

The Action Plan relating to the year 2016 had not been prepared as presented in paragraph 04 of the Public Finance Circular No.01/2014 of 17 February 2014. The Performance Reports had not been prepared for the measurement of the physical progress of the year 2016.

5.3 Internal Audit

A Senior Assistant Internal Auditor and a Clerk only had been deployed in the Internal Audit Division and as such the planning and implementation of the Internal Audit covering all the areas of the University had been a problem.

5.4 Budgetary Control

The estimated provisions for capital expenditure amounted to Rs.790 million and the actual expenditure therefrom amounted to Rs.244 million. As such of Rs.546 million or 69 per cent of the provision had been saved. Accordingly, it was observed that the budget had not been made use of as an effective instrument of financial controls.

5.5 Tabling of Annual Reports

Action in terms of Section 110 of the Universities Act, No.16 of 1978 had not been taken for the tabling of the Annual Reports for the years 2013 and 2014 in Parliament.

6. Systems and Controls

Weaknesses in the systems and controls observed during the course of audit were brought to the notice of the Vice Chancellor of the University from time to time. Special attention is needed in respect of the following areas of controls.

	Areas of System and Controls		Observations
(a.)	Accounting	-	(i.) Understatement and overstatement of income, expenditure and assets and liabilities. (ii.) Failure to compare the balances of the Ledger Accounts and Registers.
(b.)	Assets Management	-	Underutilization of Assets.
(c.)	Staff Management	-	Failure to take action for filling the vacancies.

ENVIRONMENTAL MANAGEMENT PLAN

Activity Title: Proposed Faculty of Technology Building Complex of Sabaragamuwa University of Sri Lanka
District: Ratnapura
Local Authority: - Imbulpe Pradeshiya Saba
Implementing Partner: Ministry of Higher Education and Cultural Affairs /Sabaragamuwa University of Sri Lanka

Issue for concern	Environmental Impact	Mitigation measure(s)	Monitoring indicator(s)	Responsible party (ies) I-Implement M-Monitoring	Fund Sources for Implementing Mitigation Measure	Time Frame
PLANNING						
Clearances for the project	Unless required approvals are obtained for new building it may lead to environmental and social impacts. It will not be in compliance with national environmental and social regulations.	Obtain clearances and approvals from the following agencies before commencement of construction: Imbulpe Pradeshiya Sabha. (building pan approval) UDA – for Green Building application. NBRO – for land stability and adoption of soil conservation measures	Imbulpe Pradeshiya Saba clearance. NBRO clearance. Green Building Application Process Certification process commenced.	PIU/PMU(I&M)	Project cost	Before construction
Utilities	All utilities such as water and electricity are in place so no disruptions expected regarding those.	Contractor should prepare a contingency plan to include actions to be done in case of unintentional interruption of services occurs due to electrical work at the site. This also applies to water supply	Contingency plan for services disruption.	PIU (I&M) Contractor (I)	Contactor	Preconstruction
Public consultations	Unless regular consultations are carried out with the stakeholders including community, issues that crop up during the project will go un-addressed leading to	Continue information dissemination, consultations, and involvement or participation of stakeholders during project implementation.	Disclosure records; consultations	PIU (M & I)	Project cost	During Preparation of IEE report. Once in 6 months during construction

Issue for concern	Environmental Impact	Mitigation measure(s)	Monitoring indicator(s)	Responsible party (ies) I-Implement M-Monitoring	Fund Sources for Implementing Mitigation Measure	Time Frame
	problems later on.					
Disaster management	Extreme climate events such as intense rainfall (earth slips), cyclone (especially since site is located in high wind area) etc. and fire may cause damages to lives and property. Absence of roofing design feature to withstand strong winds may lead to damage and injury.	(a) Adoption of appropriate disaster risk reduction strategy, emergency preparedness and recovery, training/orientation program for lecturers and students and construction worker, etc. (b) Include emergency evacuation points and stairways in the building in case of fire or another emergency. (c) An emergency alarm system has to be in place in all the buildings. (d) Should adopt structural features to support high wind conditions. (e) Should follow guidelines provided by NBRO as it is in a potential land slide area (to be confirmed by applying for NBRO clearance).	Disaster Management Plan in place for the Engineering Faculty. Review of NBRO clearance. Wind and climatological assessment in place and vulnerability assessment done	PIU (M) Design Architect (I)	Project cost	Before construction
DESIGN						
Integration of energy efficiency and energy conservation programs in design of project components. Noncompliance of green building guidelines	Unsustainable, energy inefficient, and un-economical unviable building will negatively impact the environment In the absence of water conservation and energy efficiency of the building structure, it may lead to resource constrains and increase the running cost.	(a) The detailed designs for the project should ensure environmental sustainability principles, including energy efficiency, resource recycling, waste minimization, etc.: - Usage of recyclable materials like wood substitutes. - Installation of sustainable energy efficiency certified equipment. - Usage of energy efficient lighting fixtures (LED) - Provision of photovoltaic cells on roofs for solar power or wind energy - Rain water harvesting structures planned for ground water recharge and rain water	Specifications for rain water harvesting structures, electrical fixtures, details of water heating system Observations Check whether energy efficient lighting systems are installed	PIU (I) Project Architect/engineer.	Project cost	During finalization of detailed designs of the buildings PMU

Issue for concern	Environmental Impact	Mitigation measure(s)	Monitoring indicator(s)	Responsible party (ies) I-Implement M-Monitoring	Fund Sources for Implementing Mitigation Measure	Time Frame
		collection. (b) Follow Green Building guidelines				
Solid and liquid waste	Lack of properly designed disposal mechanisms for solid and liquid waste may lead to contamination of surface and ground water resources. Current practice of irregular open dumping is an environmental and health risk	(a) Design a waste water treatment plant taking into account recommendations from CEA. (b) Establish a waste water management plant at the onset of the project. Bio up flow anaerobic digesters can be installed at a low cost. (c) Incorporate solid waste storage area in the plan. (d) Come to an agreement with Local Authority on waste collection and disposal until the above mechanism are in place.	Review waste disposal plan. Review waste water treatment plant. Agreement reached with LA on solid waste disposal.	PIU (M &I) MOH Imbulpe Pradeshiya Saba Design architect (I)	Project cost	During finalization of detailed designs of the buildings Before construction
Safety of students and academic staff	Lack of safety measures within the design will lead to fire and increase occupational safety hazards during operation of laboratories, etc.	a) Plan for fire extinguishers, fire alarms and a staircase for emergency evacuations. b) Necessary cut-off switches and other safety measures incorporated into the design of especially the laboratories and workshops. c) Have sufficient accessibility space for the movement of a fire truck right around the building d) Provide disability access	Review of design plans for fire and operational safety.	PIU (M) Architect/ Project engineer (I).	Project cost	At design stage and during construction.

Issue for concern	Environmental Impact	Mitigation measure(s)	Monitoring indicator(s)	Responsible party (ies) I-Implement M-Monitoring	Fund Sources for Implementing Mitigation Measure	Time Frame
Sustainability	Lack of sufficient planning to assure long-term sustainability of the improvements and ensure protection of the Faculty.	(a) Design has to include provisions for effective maintenance and protection of the Faculty in the long-term. (b) Ensure long term sustainability by considering Standards Codes for design (such as UDA and ICTAD), appropriate wind load factor and soil stability should be considered. (c) The initial designs of Faculty's academic building should consider that net allowable carrying capacity and skin friction. (d) Geotechnical report should be revisited once detailed designs are in place. (e) Structure should incorporate precautions for landslides to be prepared for the future.	Verification of the design parameters Geo technical and topography report in place	PIU (I&M)	Project cost	Before construction
CONSTRUCTION PHASE A Site Environmental Plan (SEP) will be prepared by the contractor before commencement of operation.						
Site Clarence and cut and fill operations	Construction activities such as cut and fill operation etc. may lead soil erosion, sedimentation and siltation. Decrease of infiltration of rain water, acceleration of surface runoff, are the main impacts especially since land slopes. Excavation activities may unearth "chance finds" that may have archaeologically or otherwise significant value.	(a) Provide adequate building and roadside drains along property. (b) Propose a storm water drainage system around the FT complex to capture monsoonal rain and reduce runoff. Permanent and temporary work should be undertaken to control soil erosion (c) Detailed drainage plan and soil erosion investigations need to be carried out and accordingly capacity of existing drainage works & cross drainage (CD) structures have to be duly augmented to accommodate high discharges from the	Site observation and reporting	PMU(M) Contractor (I) Project site Engineer from the Building Department (I)	Contractor cost	Weekly during construction

Issue for concern	Environmental Impact	Mitigation measure(s)	Monitoring indicator(s)	Responsible party (ies) I-Implement M-Monitoring	Fund Sources for Implementing Mitigation Measure	Time Frame
		adjoining lands and to avoid possible formation of water pools at the project site. Consult NBRO when adopting these measures. (d) Top soil generated from construction sites should be stored properly. (e) Construction activities including earth work and construction of cross drainages should be conducted during the dry season. (f) In event that a "chance find" is uncovered, all work should be stopped and site in-charge informed. He/she shall immediately inform the Department of Archaeology and the nearest police post if thought necessary.				
Land preparation and biodiversity	Activities such as site clearing, construction of culverts, removal of trees and green cover vegetation and etc., will potentially impact on the ecological resources of the forest patch. Noise generated from construction vehicles, equipment, and vehicle traffic has the potential to disturb breeding, foraging, and migrating behavior of wild species	(a) Only required land area (0.38ha according to the RBA) will be cleared in other areas the natural habitat will be maintained around the FT. (b) Demarcate a Biodiversity Conservation Area within SUSL premises to compensate for the loss of forested area. (c) Carry out habitat enrichment during landscaping. Refer RBA carried out for SUSL. (d) Actions should be taken for speedy cleaning up of oil spills, fuel and toxic chemicals in the event of accidents. (e) Care has to be taken not to introduce any alien invasive species to the area through construction machinery. (f) All the construction workers and staff of the project unit should be made aware and educated about the value of the existing natural environment.	Site observation and reporting. Check for the CEA NBRO approval letter. Permits for protected spices removal from State Timber Cooperation	PIU(M) Contractor (I) Project site Engineer (I)	Project cost	During construction

Issue for concern	Environmental Impact	Mitigation measure(s)	Monitoring indicator(s)	Responsible party (ies) I-Implement M-Monitoring	Fund Sources for Implementing Mitigation Measure	Time Frame
		Environmental awareness program should be provided to the Contractor, labours and all staff deployed at the site. (g) All staff / workers should be instructed not to disturb or harm any fauna seen near the subproject area. (h) Noise has to be kept under control by regular maintenance of equipment and vehicles. "No honking" board shall be placed near the boundaries. Noisy activity shall be prohibited during night time. IFC-WB EHS standards on noise will be applicable. (i) Construction debris should not be dispose in the forested areas				
Establishment of baseline environmental conditions prior to start of civil works	Obtaining a suitable and representative baseline data set will be critical to the monitoring and audit process because it forms the standard against which environmental impacts are assessed. Impact of vibration noise, ground water pollution due to solid and waste water disposal etc.	(a) Conduct documentation of areas for construction (camp, storage stockpiling, etc.) and surroundings (within direct impact zones). Include photos and GPS coordinates. (b) Conduct base line monitoring in respect of ambient air quality, water quality, and noise levels as per monitoring plan. (c) Thus, baseline monitoring for water quality, noise, vibration will be audited prior to the start of construction and during site supervision.	Records and photographs	PIU (I&M)	Project cost	Once prior to construction and thereafter quarterly.
Air pollution	Impact from dust generation leads to Poor air quality release of Volatile Organic Compound (VOC) from storage sites and transfer of vehicle/equipment fuels,	(a) Wet down and spray water at construction site, quarries if required. (b) Place dust screens around the construction site. (c) Dust emissions during transportation of construction materials should be controlled by enforcing speed limits on	Observations – controlled dust emissions. Dust screens in place. Construction material stored	PIU(M) Contractor (I) Air quality monitoring to be carried out by PIU.	Contactor Fee except for air quality monitoring (Project Fee)	Regularly during the construction phase. Air quality monitoring and

Issue for concern	Environmental Impact	Mitigation measure(s)	Monitoring indicator(s)	Responsible party (ies) I-Implement M-Monitoring	Fund Sources for Implementing Mitigation Measure	Time Frame
	emission of small amounts of Carbon monoxide, Nitrogen dioxide and particulates from construction activities and vehicles may compromise health of the workers and surrounding student community.	the vehicles close to site (d) Take steps to avoid dust emissions during loading and unloading of construction material. Tarpaulin covering is mandatory on trucks/lorries which are used for transporting materials. (e) All filling works are to be protected or covered in a manner to minimize dust generation. (f) All vehicles, equipment, and machinery used for construction shall conform to the Sri Lankan government vehicle emission test. For equipment emission norms as specified in air emission gazette under NEA (g) The Contractor shall maintain a record of pollution under control for all vehicles and machinery used during the contract period, which shall be produced for verification whenever required (h) The air quality monitoring will be conducted as per the plan. IFC-WB EHS standards on air quality will be applicable.	properly. Review air quality monitoring results. Review of vehicle emission tests according to the standards issues under CEA.			vehicle emission test to be carried out and reviewed six monthlies.
Noise pollution	Noise will be generated due to movement of operation of light & heavy construction machineries Increase in noise level will cause disturbance mainly to the SUSL student and staff community which is the main environmentally sensitive receptor.	(a) All machinery, equipment and vehicles should be maintained in a good condition and should be in compliance with National Emission Standards (1994). Noise control regulations stipulated by the CEA in 1996 (Gazette Extra Ordinance, No 924/12) . (b) Contractor must ensure that all vehicles and equipment used in construction shall be fitted with exhaust silencers. (c) Noisy construction work such as crushing, operation of diesel generator	Observation	PIU(M) Contractor (I)		Weekly by Engineer

Issue for concern	Environmental Impact	Mitigation measure(s)	Monitoring indicator(s)	Responsible party (ies) I-Implement M-Monitoring	Fund Sources for Implementing Mitigation Measure	Time Frame
	The workers are likely to be exposed to high noise levels that may affect them	sets, use of high noise generation equipment shall be stopped during the night time between 10:00 p.m. to 6:00 a.m. (d) The maximum permissible noise levels at boundaries of the land in which the sources of noise is located for construction activities will conform to IFC-WB EHS mix development standards.. Noise level monitoring will be carried out as per monitoring plan				
Drinking water availability at construction camp and construction site	Non-availability of drinking water for labors will result in dehydration and health risk. Especially true for this site as this is a water scarce area and currently the SUSL does not have a pipe borne water to cater for the demand of the university during dry months of the year.	(a) Sufficient supply of potable water to be provided and maintained at the site for the workers. The drinking water will be obtained from the market or any alternative source. (b) The drinking water will be stored in a suitable size storage tank to ensure uninterrupted availability. (c) In the event Pipe borne water supply which is to be obtained before construction is not sufficient for construction purpose then water bowsers will have to be brought in and storage tanks set up. (d) Contractor will submit his plan on ensuring water availability at the site for drinking sanitation and construction. The original source of the water supplied by the tankers will be recorded.	Water supply source and availability of water identified (Water availability plan).	PIU (M) Contractor (I)	Contractor Fee	Regularly during construction phase

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Arrangement for construction water in the event water requirement is large for construction and cannot be supported by the pipe water supply.	Delayed and interruption water supply leads to economic cost	(a) The contractor shall provide a list of locations and type of sources from where water for construction shall be acquired. (b) To avoid disruption or disturbance to other water users, the contractor shall arrange water from the market through authorized tanker suppliers or from the local municipality and consult PIU before finalizing the source. (c) Sufficient storage facility will have to be set up for construction water (d) If groundwater is to be extracted, NWRB will have to be contacted for approval.	Source of water used by the tanker	PIU (M) Contactor (I)	Contractor fee	Regularly during the construction phase
Resources mobilization and allocation of space	Allocation of space for storage yard for construction material, labour camp, project office may require addition amount of space.	(a) Adequate provision should be made on site to mobilize the construction equipment. (b) Sitting of the construction camp shall be as per the guidelines below and details of layout to be approved by PMU. (c) Potential sites, within the land plot, for the labor camp will be lined up to be visited by the environmental expert of PMU. The one having least impacts on the environment will be approved by the PMU and Safeguards Cell. (d) The storage location of construction materials shall be close to the site. (e) Construction camp sanitation facilities shall be adequately planned. (f) Selection of local un-skilled and skilled workers for the proposed construction activities can reduce the requirement of land for labor camps. (g) Use local materials as much as possible	Observe the location of construction camp site, sanitary facilities etc.	Contactor (I) PIU Project site Engineer (M)	Contactor	At the time of establishment of the construction camp and finalizing the storage areas.

Issue for concern	Environmental Impact	Mitigation measure(s)	Monitoring indicator(s)	Responsible party (ies) I-Implement M-Monitoring	Fund Sources for Implementing Mitigation Measure	Time Frame
		to reduce the need for storage space. (h) Care should be taken to preserve the biodiversity rich space at the southern border of the project site. (i) Under no circumstance should the construction material or solid waste be disposed to the area.				
Transport of construction material	Transportation of construction materials on road network can cause damages to the access roads. Transportation of construction material may block the access roads. Loading and unloading shuttering and metal poles and handling of heavy objects may increase the risk and injury to workers.	(a) The Contractor should obtain permits from LAs to use local roads prior to transportation of construction materials, machineries etc. (b) Construction materials shall not exceed the carrying capacity of the local road network. (c) If it is likely to cause damage to public roads, provision should be made for their repair as part of the contract. (d) Construction materials and machinery should not be placed in a manner that blocks any roads, paths or local accesses; (e) Accidents while transporting of materials should be avoided by transporting material in fully covered method. (f) Loading and unloading of material should be done according to proper safety guidelines.	Check for contractors' permits from LAs to use local roads. Check and observe whether construction materials are carried beyond the carrying capacity. Observations on unloading and storage.	PIU (M) Contactor (I)	Contractor Fee	During construction
Wastewater and sewage disposal	Untreated wastewater disposal will degrade surface and groundwater.	Ensure that the domestic waste water released is in conformity with the CEA, Local Authority guidelines, and SLSI standards. All sewage should be collected into a septic				

Issue for concern	Environmental Impact	Mitigation measure(s)	Monitoring indicator(s)	Responsible party (ies) I-Implement M-Monitoring	Fund Sources for Implementing Mitigation Measure	Time Frame
	Untreated sewage will contaminate and degrade surface and ground waters as well as pose health risks.	tank and disposal should be carried out in consultation with IPS. IFC-WB EHS standards will be applicable to disposal of sewage effluent.				
Solid waste disposal	Solid waste associated with construction may impose several negative environmental and social impacts to the project affected area including impact on ecology, public health and scenic beauty. Labour camps, garbage disposal sites and material storage yards provide favorable habitats for vectors of diseases like mosquitoes and rats. Contamination of water bodies with wastewater, construction debris and spoil will create significant impact on aquatic lives and people inhabiting the area.	(a) Contactor and the site engineers should consult the Imbulpe Pardeshya Sabha (IPS) at the onset of the project on waste collection and disposal. (b) Selected disposal site by the contractor should exclude areas which are close to public and environmentally sensitive areas. Prior approval for the disposal site should be obtained from IPS via Grama Niladhari. (c) All debris and residual spoil materials generated from construction activities shall be re-used wherever possible for site leveling, back - filling under instruction of State Engineering Cooperation (SEC), (d) Colour coded bins be provided at the labour camps. (e) No burning will be carried out on site (f) On completion of the works, all temporary structures will be cleared away, at the contractor's expense, to the entire satisfaction of PIU	Waste disposal sites identified. Agreement for disposal of waste with the Imbulpe Pradeshiya Saba in place.	PIU (M) Contactor (I)	Contractor fee	Regularly during the construction phase (Weekly

Issue for concern	Environmental Impact	Mitigation measure(s)	Monitoring indicator(s)	Responsible party (ies) I-Implement M-Monitoring	Fund Sources for Implementing Mitigation Measure	Time Frame
On Site housekeeping	Lack of good housekeeping practices can lead to lack of general cleanliness and impact on ecology, public health and scenic beauty.	a) Proper solid waste disposal, sanitation and sewerage facilities (drinking water, urinals, toilets and wash rooms in working condition should be provided to the site of labour camps. b) Practice cleanliness and good housekeeping practices on site. c) There should be a demarcated waste storage area on site. Provision of proper drainage facilities to minimize water stagnation around worker-based camps. d) Under no circumstances should the solid waste be burned on site. Additionally, under no circumstances will any construction waste will be disposed of around the project site.	Observation on cleanliness at the construction site.	PIU (M) Contactor (I)	Contractor fee	Regularly during the construction phase (Weekly)
Occupational Health and Safety	Unless worker safety is complied with, it can lead to injury and other health risks.	(a) Contactor to comply with ADB Environmental, Health, and Safety Guidelines, Labor Organization (ILO) convention No. 62, and Factory Ordinance to the extent that are applicable to workers contract. First aid treatment will be made available for all injuries likely to be sustained during work. (b) Develop and implement comprehensive site-specific health and safety plan on Occupational Health and Safety (c) A management strategy and applying practices to eliminate, or minimize, fatalities injuries, and illnesses for workers performing activities and tasks associated with the project. (d) Provide medical insurance coverage and	Review of health and safety plan. First aid available onsite (appropriately equipped). Observations on safety attire of workers. Regular jobsite safety inspections being conducted. Data on available personal protective equipment.	PIU (M) Contactor (I)	Contractor fee	Regularly during the construction phase.

Issue for concern	Environmental Impact	Mitigation measure(s)	Monitoring indicator(s)	Responsible party (ies) I-Implement M-Monitoring	Fund Sources for Implementing Mitigation Measure	Time Frame
		indemnity for workers. (e) The contractor will conform to all anti dengue instructions given to him by the PHI and the PIU. (f) Workers employed on mixing cement, lime mortars, concrete, etc., will be provided with protective footwear and protective goggles. (g) Workers engaged in welding works will be provided with welder's protective eye shields. (h) The use of any toxic chemical will be strictly in accordance with the manufacturer's instructions. A register of all toxic chemicals delivered to the site will be kept and maintained up to date by the contractor. (i) Use of licensed and trained vehicle operators, workers should adopt necessary safety measures as stated in the contract including using of hard hats, boots, gloves and appropriate clothing. (j) First aid provisions available on site and personnel trained on use. (k) Provide suitable communication and information on safety (l) The construction site will be properly barricaded by appropriate material of adequate height to avoid noise impacts in the surroundings.				

Issue for concern	Environmental Impact	Mitigation measure(s)	Monitoring indicator(s)	Responsible party (ies) I-Implement M-Monitoring	Fund Sources for Implementing Mitigation Measure	Time Frame
Landscaping	In the absence of proper landscape, it will not be aesthetically pleasing. Landscaping should blend in with the surrounding ecosystem.	(a) Project landscape activities have to be done as per either detailed design or typical design guidelines. (b) Plant floral species identified in RBA to enrich opened out areas. Natural habitat will be maintained as much as possible in other areas.	Site observation and reporting. Note trees and shrubs planted by the project.	PIU(M) Contractor (I)	Contractor fee	Towards end of construction
Onsite emergency plan for minor accidents and mishaps.	Absence of emergency plan may lead to death to the worker and economic cost to the project.	Onsite emergency management plan will be prepared by the contactor. Insurance facilities for the workers in place including indemnity.	Emergency plan for minor accidents and mishaps in place. Worker insurance.	Contactor (M&I)	Contractor Fee	Meetings on emergency actions to be held once in 6 months.
OPERATIONAL PHASE						
Monitoring of Environmental conditions and parameters	Unless regular monitoring is conducted, it may lead to environmental pollution issues during the operation of the Campus.	Periodic monitoring of the ambient air quality, noise level, surface water quality, soil quality in the subproject area as suggested in the monitoring plan through an approved monitoring authority.	Monitoring results and relevant standards	PIU (I &M) CEA/ Imbulpe Pradeshiya saba (M)	Project operation cost (SUSL)	As per the monitoring plan
Erosion control	Blocking drainage systems may occur due to sediments, improper disposal of debris during maintenance activities or ignorance. etc. Blocked drains may lead to erosion issues.	(a) University needs to undertake regular maintenance of the drainage system to avoid drainage congestions and erosion.	Site observation of congested drains and reporting No complaints from the MOH office	Maintenance engineer at SUSL (I) Imbulpe Pradeshiya saba PHI (M)	Project operation cost (SUSL)	Once in 4 months
Solid waste management	Irregular collection of solid waste will increase the risk of solid waste piling up at	(a) A sustainable and self-sufficient solid waste management plan has to be developed within the FT.	Waste plan in place and implemented.	Imbulpe Pradeshiya saba PHI(M)	Project Cost (SUSL)	Once in 3 months

Issue for concern	Environmental Impact	Mitigation measure(s)	Monitoring indicator(s)	Responsible party (ies) I-Implement M-Monitoring	Fund Sources for Implementing Mitigation Measure	Time Frame
	the Faculty of Engineering premises. It can also lead to an increase in vector population and increase health risks.	(b) Enter into an agreement with the IPS for waste collection and disposal on a daily basis. Develop a schedule for collection with the consensus of the IPS. Allocate budgetary provisions within the FT budget for their services. (c) Develop a composting mechanism for FT. Fast track the financial support and guidance offered by CEA for the composting project under the Pilisaru program. (d) Train the students on importance of social responsibility and garbage disposal. Provide colour coded bins at several locations to encourage source separation. (e) Ensure demarcated solid waste storage area. This storage facility should be able to accommodate solid waste up to 7 days until disposal. (f) Come to an agreement on with the services provider on disposal of mechanical waste generated as result of maintenance work on equipment and computers and machinery, solar panels etc. procured for FT. (g) Illegal garbage dumping & firing is banned.	Cleanliness and good housekeeping practices observed. Review solid waste management plan.	Maintenance engineer at SUSL (I)		

Issue for concern	Environmental Impact	Mitigation measure(s)	Monitoring indicator(s)	Responsible party (ies) I-Implement M-Monitoring	Fund Sources for Implementing Mitigation Measure	Time Frame
Domestic liquid waste disposal	Poor maintenance of sanitary facilities and improper disposal of domestic waste water will result in environmental pollution.	(a) Properly waste water treatment plant is in place upon calculation of the water requirement and the flow rate to cater for the number of occupants. The wastewater treatment plan should be shared with ADB. (b) Ensure that the domestic waste water is directed to waste water treatment plant in conformity with the CEA, Local Authority guidelines and SLSI standards. Wastewater should not be discharged to the environment prior to the treatment.	wastewater treatment plant maintenance. Carry out water quality tests of the treatment plant effluent.	Imbulpe Pradeshiya Saba PHI (M) Maintenance engineer at SUSL (I)	Project operational cost (SUSL)	Once in 6 months or when need arises.
Sanitary facilities	Discharge of untreated or insufficiently treated sewage, and lack of maintenance of sanitary facilities may lead to: • Contamination of drinking water (ground and surface) • Spread of diseases among the student population and surrounding community	(a) IPS should be consulted and an agreement should be in place as to who will empty the sewers and where it will be discharged. Any release of sanitary sewage discharge should conform to IFC-WB EHS standards which override the national standards. (b) Till discharge, sewage will be stored in sealed septic tanks. (c) It is recommended that SUSL also looks into establishing a sewage treatment plant for the whole complex (or atleast for the FT).	Observation on cleanliness and maintenance of sanitary facilities. Maintenance schedule in place Continuous water supplies available in the toilets. The disposed waste water will conform to the waste water discharge standard stipulated under the NEA	Maintenance Engineer at SUSL.	Project operational cost (SUSL)	Bi-annually
Waste generated on account of	There is maintenance waste such as e-waste etc.	(a) The solar thermal panels and water will be operated by the supplier. Any waste that is generated will be taken by the	Agreements and plan in place for the disposal of	SUSL and the suppliers of the renewable	SUSL operation cost	During the entire operational

Issue for concern	Environmental Impact	Mitigation measure(s)	Monitoring indicator(s)	Responsible party (ies) I-Implement M-Monitoring	Fund Sources for Implementing Mitigation Measure	Time Frame
operation and maintenance		supplier for possible reuse and recycle. (b) E-waste to be disposed of in an appropriate manner. Have an agreement with the local authority. (c) Disposal of toxic chemicals from laboratories should be arranged with relevant institutions/private companies.	the identified items	energy systems (I)		phase
Health and Safety of students:	Accidents during practical sessions in laboratories. Risk of accidental deaths due to negligence.	Train the students on occupational risk involved in handling the equipment. Train the students and teachers on managing risk and emergencies. - Provision of first aid kit and train the teachers on usage. - Emergency switches should be properly covered. - Fire extinguishers must be placed adequately and they should be working at all times. - The building design should provide space for the fire extinguishing truck to be accessible from all sides of the building.	First aid kit in place. Switches appropriately placed.	Contractor (I) PIU (M)	SUSL monitoring budget	Annually
Onsite emergency plan for minor accidents mishaps and disaster management plan.		(a) The Engineering Faculty of SUSL should prepare an onsite emergency plan in event of minor accidents. (b) A in house plan in event of a natural disaster should be developed to address floods and cyclones.	On site emergency plan and disaster management plan documented and in place.	SUSL (I)	Project operational cost (SUSL)	Mock drills carried out every quarter.

Issue for concern	Environmental Impact	Mitigation measure(s)	Monitoring indicator(s)	Responsible party (ies) I-Implement M-Monitoring	Fund Sources for Implementing Mitigation Measure	Time Frame
Maintenance of plantation and landscaped area in the project site	In the absence of maintained landscape, the Engineering Faculty grounds will not be pleasing to the eye	(a) The faculty head with the appropriate support staff allocated for the purpose will be responsible for the maintenance of shrubs, tree and land scape of the area. Minimum of 90% survival of plans will be maintained. Any short fall will be replaced during the monsoonal period.	Survival rate of plans, trees and shrubs in the landscaped area	SUSL (M) FT head and associated staff (I)	Project operational cost (SUSL)	Every year before the onset of the monsoon period
EPL for Canteen operation	Unless approval by obtaining an EPL for the canteen is carried out, environmental guidelines of the CEA will not be met. This will be required if canteen capacity exceeds 50.	Apply for an EPL from the CEA for the canteen operations. Ensure renewal of the license as required.	EPL in place	PIU (I) Imbulpe Pradeshya Saba MOH office	Project cost	Before operation of canteen.
Adopt food safety guidelines for food handling in canteens.	If canteen staff don't maintain personal hygiene, it could be issue for the students and lecturers. (Previously there has been issues and they had been warned by the MOH office)	(a) The conditions given below should be included in the contractual arrangement with the canteen operator: • Health checks of the canteen should be done annually • Prepare set of rules on personal hygiene should be displayed and followed. • Adopt food safety regulation imposed by the Ministry of Health. • Encourage regular hand washing during working hours. • Strike rules for canteen operators such as scalp hair be fully covered.	PHI Reports, observations.	Faculty head and the supporting staff at the university (I) Imbulpe Praeshiya Saba PHI (M)	Canteen operator cost	Bi-annual spot checks

Issue for concern	Environmental Impact	Mitigation measure(s)	Monitoring indicator(s)	Responsible party (ies) I-Implement M-Monitoring	Fund Sources for Implementing Mitigation Measure	Time Frame
Change in land use with unauthorized development	Likely change of land use due to squatter / encroachment within subproject land area and the surrounding.	a) Immediately after the construction phase, it is necessary to ensure that no further deterioration or major land use changes such as ribbon development takes place in a manner that will jeopardize the interests of the SUSL. (b) Squatter development along the subproject shall be strictly avoided by proper regulation and vigilance. SUSL to coordinate with LA.	Observations	PIU/PMU (M) Imbulpe Pradeshiya Saba (I)	SUSL	Bi-annual

P.S. Note: PIU: project implementation unit, PHI: public health inspector allocated to the area from the Pradeshiya Saba Imbulpe, SUSL; Sabaragamuwa University of Sri Lanka, NEA; National Environmental Act.