

Initial Environmental Examination (Draft)

June 2018

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

CURRENCY EQUIVALENTS

(as of 31 May 2018)

Currency unit	–	Sri Lanka rupee/s (SLRe/SLRs)
SLRe1.00	=	\$0.00633
\$1.00	=	SLRs158.03

NOTE

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

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INITIAL ENVIRONMENTAL EXAMINATION

**PROPOSED FACULTY OF TECHNOLOGY BUILDING
COMPLEX IN SABARAGAMUWA UNIVERSITY OF SRI LANKA**

PART I: IEE

SRI LANKA- PROPOSED FACULTY OF TECHNOLOGY BUILDING COMPLEX IN
SABARAGAMUWA UNIVERSITY OF SRI LANKA

Project Number:

JUNE 2018

Ministry of Higher Education and Highways, Sri Lanka

Prepared by TMS for SUSL

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PART III: ESMP

ABBREVIATIONS

ADB	Asian Development Bank
AP	Affected Person
BO	Built operate
BIQ	Basic Information Questioner
BOQ	Bill of Quantities
BD	Building Department
CAP	Corrective Action Plan
CEA	Central Environmental Authority
CEB	Ceylon Electricity Board
COC	Certificate of Conformity
DBO	Design-built-operate
DMC	Developing Member Country
DOF	Forest Department
DPC	Damp-proof course
DSD	Divisional Secretariat Division
DM	Disaster Management
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessment
EPL	Environmental Protection Licenses
ESIA	Environmental and Social Impact Assessment
EMP	Environmental Management Plan
EMP	Environmental Monitoring Plan
ESMP	Environmental Social Monitoring Plan
FTP	Faculty of Technology Project
FT	Faculty of Technology
GRC	Grievance Redress Committee
GRM	Grievance Redress Mechanism
GND	Grama Niladari Division
HSE	Health, Safety and Environment
IEE	Initial Environmental Examination
IP	Indigenous Peoples
IR	Involuntary Resettlement

ILO	International Labor Organization
LFS	Labour force survey
M&E	Monitoring & Evaluation
MOFP	Ministry of Finance and Planning
MOHEH	Ministry of Higher Education and Highway
MMDE	Ministry of Mahaweli Development and Environment
MSL	Mean sea level
NEA	National Environmental Act
NIRP	National Involuntary Resettlement Project
NWRB	National Water Resources Board
NWSDB	National Water Supply and Drainage Board
PAA	Project Approving Authority/Agency
PBC	Performance Based Contracts
PIU	Project Implementation Unit
PMC	Project Management Consultant
PMU	Project Management Unit
PP	Project Proponent
REA	Rapid Environmental Assessment
SLEC	State Level Empowerment Committee
SLLRDC	Sri Lanka Land Reclamation and Development Cooperation
SPS	Safeguard Policy Statement
STHRDP	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
UGC	University Grant Commission
VEC	Valued Environment Component
WRB	Water Resource Board

Executive Summary

A. Introduction

1. Government of Sri Lanka with loan funding from the Asian Development Bank (ADB) has proposed to implement Science and Technology and Human Resource Development Project (STHRDP). The Ministry of Higher Education (MOH) shall be the Implementing Agency and the University Grant Commission shall be the executing agency for the Project. This project aims to increase the technology oriented work force to transform Sri Lankans growing economy. Under this Project the Sabaragamuwa University of Sri Lanka (SUSL) will build a new Faculty of Technology (FT). This will be referred to as the “project” in this report.
2. In pursuance of the above, the Total Management Solutions Company (Pvt.) Ltd (TMS) has been appointed as the Consultant by ADB to carry out the environmental safeguards services.

B. Objectives of the IEE

Following are the objectives of the Environmental Study:

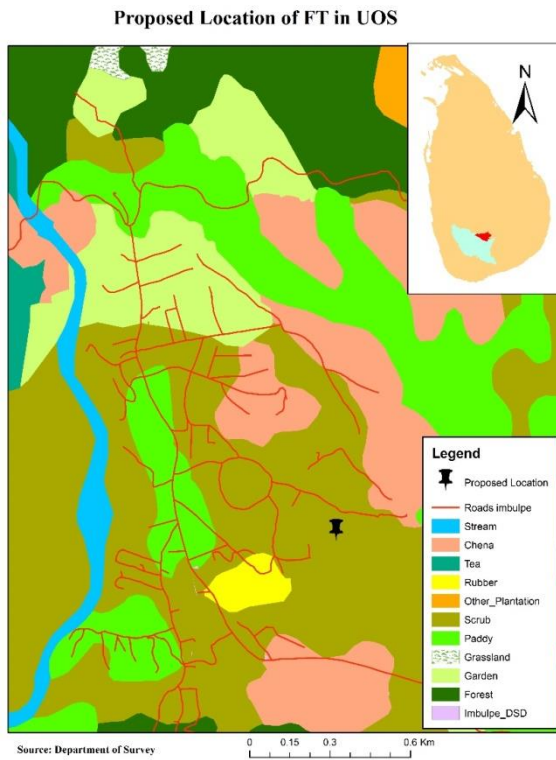
- Determine the category of the project depending on improvement proposal, environmental sensitivity and magnitude of impacts, i.e. screening as per Government of Sri Lanka’s regulations and ADB’s Safeguard Policy Statement 2009;
- Determine the appropriate extent and type of EA required (IEE or EIA), i.e. scoping;
- Determine the requirement of statutory clearances;
- Baseline environmental monitoring and survey;
- Prediction of impacts on relevant environmental attributes and mitigation measures to minimize the impacts;
- Preparation of IEE Report including ESMP

C. Description of the Project

3. The proposed faculty of technology (FT) development project is located in Imbulpe DS Division in Rathnapura District, Sabaragamuwa Province, Sri Lanka. The project site is accessible from Colombo on the A4 Colombo – Batticaloa highway. The university is located alongside B 593 - Pambahinna-Kumbalgama-Rajawaka-Kapugala Road maintained by RDA. The site borders the Uva Province (about 6 km). The proposed project site is located within the existing Sabaragamuwa University of Sri Lanka premises. The location coordinates are $6^{\circ}42'33.33''\text{N}$, $80^{\circ}47'35.17''\text{E}$ longitude.
4. Establishment of such a faculty will generate new employment opportunities for the local community as well as improve skills and training in the engineering technology and bio system technology. Thus it will simultaneously contribute to improvement of education in whole country while improving opportunities for employment. There is bound to be increased interest in these fields attracting young people. The faculty will facilitate infrastructure to conduct lectures and engage in activities that will promote technology subjects.
5. The FT will be composed of XXX stories from ground floor to upper floor. The first phase 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.

D. Projects Highlights

Figure D1: Site location



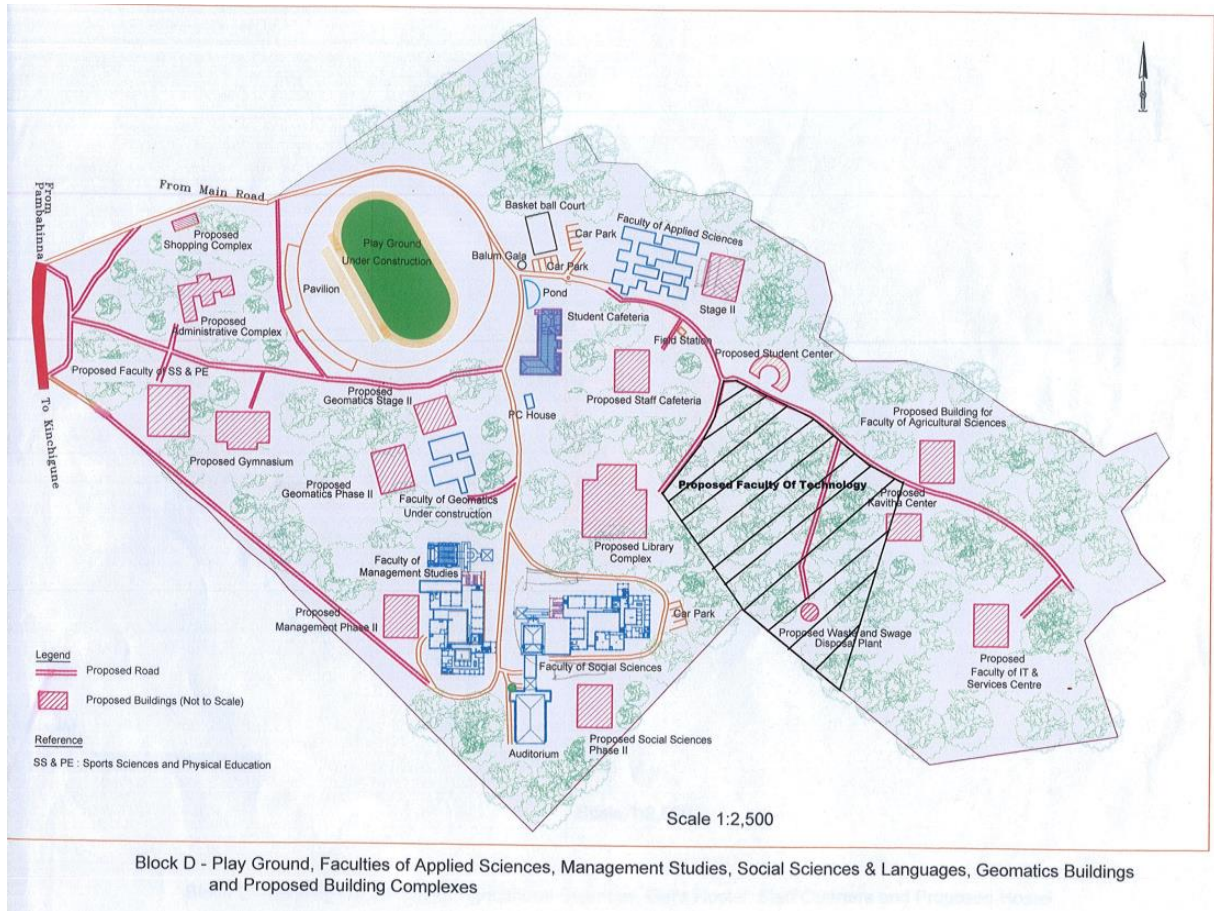
Source: Prepared by TMS

Figure D2: Plates of project site



Source: Captured by TMS

Figure D3: FT project location:



1. Project Information

Table D1: Salient Existing Features of the Project

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		40,610	
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	

2. Annual Students Enrollment to the Faculty

6. The project implementing agency (IA) is the Ministry of Higher Education and Highways (MOHEH). For this project, a management unit will be established under the MOHEH. The Project Implementation Unit (PIU) is the University of Sabaragamuwa. The Faculty will be developed on a 6 acre land. Facilities to be provided within the faculty will include areas for training, lecture halls and teaching and research laboratories, student and staff canteen, and admin block. Bachelor of Biosystems 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. Finally, 450 students will be enrolled during the three year study program. Table E 2 provides student enrolment details for next five years.

Table D2: Information on the student enrollment for next five years

Year	New Intake (No. of Student/Year)
Year 1	150
Year 2	150
Year 3	150
Year 4	150
Year 5	200
Total	800

3. FT Graduate Employment Prospect

7. The degree programs offered at SUSL are currently in demand and matches the country's socio-economic needs. Therefore SUSL graduates can easily secure jobs. Graduates of the FT will contribute to technological innovation in local and international industries, while contributing towards economic development of the country through the invention of hi-tech exports.

8. The technology stream degree program at the university was developed with the private and public sector industrial partnership. The degree programs under SUSL involves student industrial placements with industrial research projects for exposure to industrial processes and systems. Therefore graduates at SUSL are trained to face the challenges of industrial growth both locally and globally. These highly skilled graduates will have a competitive edge over others in the technology field.

E. Policy, Legal and Administrative Framework

9. As per the ADB's Safeguards Policy Statement of 2009 and based on the REA Checklist of ADB classification, the FT is categorized as Environment Category B. According to the BIQ and IEE/EIA environmental guidelines of Central Environmental Authority of Sri Lanka (CEA), the proposed project falls in to the "non-prescribed" category. Therefore environmental assessment (EIA or IEE) will not be required from the government of Sri Lanka to proceed. The IEE was carried out as a requirement of ADB under its safeguards policy to be eligible for their financing.
10. The main objective of this IEE report is to prepare a comprehensive account of the current environment condition of the selected site for the construction of the FT in Imbulpe Divisional Secretariat, Rathnapura District. It also aims to identify any potential negative environmental or social impacts in the immediate vicinity or surrounding areas that maybe short term or long term. Accordingly a single consolidated IEE report is submitted for ADB to facilitate their decision making.
11. Field observation of the project site within Imbulpe Divisional Secretariat was carried out on 23rd of March 2017. During the site visit, the REA, IP and IR checklists were filled and the findings incorporated in the IEE. 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. A stakeholder meeting was further conducted on 1st May 2018. Secondary information for the report was gathered from printed materials and other sources of Government Departments, Authorities, Divisional Secretariat and relevant websites.

12. However, CEAs consent for the projects under non-prescribed category has not been obtained yet, the process has been initiated. A summary of the statutory clearances required for the FT is presented in **Table- E 3**.

Table E3: Statutory Clearances required for the Project

Type of Clearance	Activity	Authority	Timeframe
Environment Clearance Environmental Protection Licensing) Regulation No. 1533/16of 2008	Implementation of the project and waste water treatment guidelines.	CEA	Before construction
Clearance from the Mereology Department	Obtain clearance from the Meteorology department on wind resistance to the building. Carry out a wind vulnerability assessment with master plan	Mereology Department	Before construction
Clearance from CEB one removal of the forest cover since it is under the walwe basin and Samanalawewa reservoir	Obtain clearance from CEB for tree removal	CEB	Before construction
Permission for storm water drainage and infilling and building	Implementation of the project.	NBRO	Before construction
Clearance for development activities Green building certificate (Annex 01)	Implementation of the project and construction of the building. They will direct to relevant authorities.	UDA	Before construction
Local Government 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.	UDA, Irrigation Department RDA, CEA	Before construction
Consent from Ceylon Electricity board	Obtaining the electricity supply for the FT complex	Ceylon Electricity Board	Before completion of the building
Water Supply	Supply of potable water for the facility and supply during the construction	NWSDB	After completion of the building

Source: Compiled by TMS

13. Apart from the clearances for the overall project work, the contractor, before starting the construction work, has to obtain required clearances listed in Table- E.4. for operating his/her equipment and carrying out construction work.

Table E4: 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 Clearance	Forest Department Divisional Secretary	Forest Ordinance
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 29 of 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)	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 (North western province)	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- <ul style="list-style-type: none"> • 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

Source: Compiled by TMS

14. In addition to the above, Contractor has to obtain;

- i. Change of land use certificate from the Divisional Secretariat of Imbulpe
- ii. Clearance from NBRO on the gridlines to follow in construction of the building.
The Geochemical report that has been enclosed with the IEE does not evaluate the load transferred from the building since they were not given the information at the time of investigation (refer recommendations of the report annex 2)
- iii. Clearance letter from CEB stating that the area is not watershed area and it does not impact the hydrology of the Walawe basin and the Samanala wewa reservoir.

F. Description of the Environment

15. FT development project is located in Imbulpe in Rathnapura District. This Division has a land extent of 0.8470 hectares. The site is located within the Pradeshiya sabha limits of Imbulpe. The proposed project site is within the current University premises. The land frontage is to the main Colombo – Batticaloa highway. There are several crucial environmental challenges facing the Imbulpe DSD including soil erosion, landslides, reduction of catchment areas, forest cover depletion and etc.

1. Seismicity

16. The project is located in the Sabaragamuwa Province of Sri Lanka which is not an active seismic region. The area does not have any potential risk of damage due to earthquakes.

2. Land Use

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 (32.69%) and steams (3.12%).

3. Soil Quality

17. The topography of the selected land is relatively sloppy terrain. The soil found in Imbulpe DSD is loose to medium dense sandy SILT/ SILT (Top soil), dense to very dense silty SAND/ sandy SILT, medium dense to very dense silty SAND/ sandy SILT (completely weathered rock), highly weathered insitu boulder, weak GARNET BIOTITE GNEISS. (refer annex 2 soil report)

4. Climate and Meteorology.

18. Imbulpe division lies within the wet and inter-regional zone in the country and due to the sloppy terrain it shows a uniform rainfall pattern. The area receives rainfall from the south west monsoon, North East monsoon and convective rains. Maximum rainfall of 227 ± 10 mm per month and minimum rainfall is 81 ± 11 mm per month (source: “Adaptation Strategies For Climate Change And Carbon Friendly Tea Cultivation” in proceedings of the 28th experiments and extension forum by The Tea Research Institute of Sri Lanka). The average rainfall of this division is 2000mm- 4500mm. The average temperature is 25°C, but because of the highlands to the north, sometimes temperatures drop to about 20°C. Refer Table F5 for climate information.

Table F5: summarizes the metrological data for the site

Parameters	Amount
Maximum Temperature(°C)	25°C
Minimum Temperature (°C)	16°C
Maximum Relative Humidity (%)	82.1%
Minimum Relative Humidity (%)	56.6%
Total Rainfall (mm)	1646mm
Average Wind Speed [CK1]	12Km/h
Predominant wind direction	From South West to North East

5. Wind

19. An average wind speed of 31 km/h has been recorded during the months of June to September. Although at times winds may appear somewhat gusty, it will not impede any recreational activity like hiking, camping or sightseeing. The wind blows in from the north west of the study area.

6. Ambient Air Quality

20. To draw up a baseline status of the ambient air quality, the SUSL will take the measurements prior to the development project.

7. Ambient Noise Level

21. To assess the base line value background noise level, ambient noise monitoring will be conducted by the SUSL prior to the construction activities at the site.

8. Surface and Groundwater Quality

22. The baseline data on water quality will be collected at two locations within the project area by the SUSL and will be monitored, analyzed and assessed. The water quality results will indicate quality of the adjoining Samanala Wewa reservoir and the ground water. Water quality parameters will include Coliform Count, BOD, COD.
23. There are several reservoirs and streams in Imbulpe DS. These are mainly used for the purpose of agricultural activities. The main reservoirs within the division are tanks such as Denagam Oya, Hirikatu Oya, Belihul Oya. SUSL rain water is currently the main sources of water available in project area.

9. Ecology and Biodiversity

24. Adara Kanda is located in 3 km away from the University and Horton plains 3.7 km. Both these habitats are rich in faunal and floral diversity, however at the moment Horton plains has been degraded due to human activity. Herpetofauna, Avifauna, terrestrial mollusk species of endemism are common to the region.
25. The study reported 144 species including 98 vertebrate species representing 50 families and 46 species from the selected invertebrate taxa representing 11 families to inhabit the moist-semi-evergreen forest patch in the project area and its periphery, including those disturbed/developed areas outside the immediate periphery. This include species 17 endemic to Sri Lanka, while none of them are restricted-range species within the study area. Further 12 species among them are listed as nationally threatened species (MOEMD 2012). A biodiversity assessment was carried out by SUSL at the sample coordinates. Recorded fauna are given in Table F6.

Table F6. Sample coordinates for the biodiversity survey is given

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

26. The RABA suggests the project site to harbour a moderately high species richness. The study taxa also indicate considerable (above average) percentages of endemic and threatened species in some taxa such as the land snails, reptiles and amphibians. Table F7 provides details of the Species diversity selected taxonomic groups of vertebrates and invertebrates

Table F7: provides details of the Species diversity selected taxonomic groups of vertebrates and invertebrates within the proposed project site

Taxonomic Group	No. of species	No. & (%) endemic species	No. & (%) threatened species
Land snails	10	5 (50%)	5 (50%)
Odonates	7	0	0
Butterflies	29	2 (6.9%)	2 (6.9%)
Amphibians	5	2 (40%)	0
Reptiles	16	2 (12.5%)	1 (6.3%)
Birds	68	5 (7.4%)	1 (1.5%)
Mammals	9	1 (11.1%)	3 (33.3%)
TOTAL	144	17 (11.8%)	12 (8.3%)

27. Among the land snails recorded during the study, the Sri Lankan endemic and critically endangered Sri Lanka Lucid Satiella Snail (*Satiella membranacea*) is of high conservation significance. Further, two endangered species i.e. Itier's Operculate Snail (*Aulopoma itieri*) and Sphaeroid's Operculate Snail (*Aulopoma sphaeroidium*) and two other 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*)). Nevertheless, none of these species are range restricted with emphasis to the project area.

28. 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. Table F8 provides species diversity for selected taxonomic group of vertebrates and invertebrates.

Table F8: Species diversity selected taxonomic groups of vertebrates and in vertebrates within the proposed site

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	0.639	No specimens	No specimens	No specimens	×	0.32	Very low diversity
	1-D	(single species)	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	

29. In the RBA the floral diversity indices were not calculated nor list of endemic species provided. The report did not provide an assessment of the recommended list of species to be planted to propose mitigatory measures such as habitat enrichment. Therefore, the study supports the argument that project area currently harbours a **natural forest patch** with moderate significance on ecological value in terms of floral and faunal diversity. It is

recommended that a proper floral survey is carried out with the species diversity indices prior to construction of the project. The RBA has not properly assessed the community interactions with the forest resources, species indices for the flora, and does not provide species recommended list for the site. The RBA is currently being updated.

30. However the proposed FT project is, 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 species¹.

8. Educational, Medical and Religious Properties

31. Health facilities in this area include divisional hospital, peripheral units, central dispensaries, maternity homes and dispensaries. Generally, the education level was fairly good with literacy rate being around 94% in 2012. There are 52 temples, 8 Catholic Church and 20 Hindu Religious places of worship in the DSD.

9. Archaeological Sites

32. Cultural, Archaeological and Historical Significance sites in Imbulpe DSD include historic. According to the historical and the archeological information, this area dates back to 2nd BC. And also, according to the folktales can identify the information to Rawana Ella. The distances from the proposed FT to the protected areas is provided in Table F9 below.

Table F9: Distance from archeological sites

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 Wildlife conservation

¹ RBA of the SUSL

² Mihintale DSD Resource Profile 2016

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

10. Demographic Details of Affected Population

33. The population and community in this area are predominantly Sinhala (85.7%), 14.2% Tamil, 0.028% Muslim, and 0.01% others. When considering the ethnicity within the DSD, 83.96% of the population is Buddhist, 13.15% is Hindu, 0.034 % is Islam, and 2.84% is Christian.
34. The agriculture sector provides employment for 31.4%, Self employed 10.3% public sector 5.81% and private sector 13.6%. The unemployment rate is 21.09% currently. Population in Imbulpe engages in agriculture, industry and some employed in the government sector. Villagers in the project area predominantly engage in agriculture and are daily waged earners.

F. Analysis of Alternatives

35. Although the proposed FTP is located in close proximity to a Samanala Wewa reservoir, impacts associated with the construction stage are temporary, short term. Any longer term impacts can be managed by adhering to the ESMP. There is no other existing land in the vicinity that can be developed as an alternative to the proposed project. Therefore, examination of alternatives to the project's location, design, technology, and components show that it is compliant with the building guidelines at the current location.
36. The selected site is strategically located close to the Samanala Wewa reservoir in the Imbulpe DS division in Sabaragamuwa Province. It is closely located to mineral resources such as Gems, Sand, Black Racks, Silica, Iron stones, Dolomite, Gold, Quartz and sulfur. It is easily accessible to the student community to carry out research and their educational activities. Thus, the development of the land into a training facility will be the better option under the existing condition.

G. Anticipated Impacts and Mitigation Measures

37. An Environmental and Social Management Plan (ESMP) has been developed to provide mitigation measures to reduce/mitigate the negative impacts. Locations and siting of the

- proposed infrastructure were considered to further reduce impacts. These include locating FT within SUSL owned land (within exiting premises).
38. The ESMP includes design measures such as (i) solid and liquid waste management (ii) wash water recovery for the WTP to reduce effluent to be discharged; (iii) water management due to scarcity (iv) quick leak detection and rectification to save the resources, etc. during construction and operation.
39. Other mitigation measures include (i) management of noise and air quality (ii) stakeholder consultations to raise awareness and to inform residents and businesses of potential disturbances (ii) use of dust-suppression methods such as watering and/or covering of stockpiles; and (iii) finding beneficial use of excavated materials and spoil material. As for the O&M phase, facilities will need to be repaired from time to time, but environmental impacts will be much less than those of the construction period as the work will be infrequent. During operation solid waste management and waste water treatment are important to be considered in the design and implementation. The design of the waste water treatment plant includes dewatering and drying areas as part of sludge management. The ESMP includes mitigation measures and monitoring plan to ensure compliance to environmental standards during O&M phase.
40. A summary of the potential environmental impacts during construction and operation phase along with recommended mitigation measures is summarized in a Table G10.

Table G10: Summary of Anticipated Impacts and Recommended Mitigation Measures

Issues of concern	Anticipated Impacts	Proposed mitigation Measures
Pre-Construction and Construction Stage		
Clearance for the project	Unless Local Authority building approval is obtained for new building it may lead to environmental and social impacts. It will not be in compliance with national environmental and social regulations. High winds in area may impact on structural features.	Obtain approval from Imbulpe Pradehsiya Saba and UDA before commencement of construction. Liaise with CEB to obtain electricity. Liaise with Met Department of wind evaluation study prior to construction. Obtain NBRO Clearance.

	Unplanned construction may increase or trigger landslides.	
Sustainability of project.	Lack of sufficient planning to assure long-term sustainability of the improvements and ensure protection of the FT	Design has to include provisions for ensuring effective maintenance and protection of the FT in the long-term. The long-term sustainability has been ensured by consideration of relevant authorities for Standards Codes for design (such as UDA), appropriate load factor, and detailed design after carrying geotechnical investigations. The current geotechnical information was based without a master plan. Reinvestigate it with the master plan in place and obtain the allowable load and the carrying capacity.
Risk of landslides	<p>Lack of drainage within the project site will submerge and open up land slide issues</p> <p>In the absence of a proper storm water drainage system, there will be a risk of water logged conditions around the site that will increase a tendency of land slides.</p> <p>Surface drainage at the site has to be improved to avoid issues of land slide,</p>	<ul style="list-style-type: none"> • Will need to fill land by about 3 feet to reach the road level. • Identify and develop drain plan to carry rain water towards the tank. • Sloping of terrain to ensure natural drainage. • In places where there is cut and fill ground establish buffer zone • Prior to construction proper drainage measures should be adopted to slow flow of storm water with minimum disturbance to the subsurface

<p>Integration of energy efficiency and energy conservation programs in design of project components. Non compliance of green building guidelines</p>	<p>Unsustainable, energy inefficient, and un-economical unviable building that 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.</p>	<p>The detailed designs for the project should ensure environmental sustainability principles, including energy efficiency, resource recycling, waste minimization, etc.:</p> <ul style="list-style-type: none"> - 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 - Rain water harvesting structures planned for ground water recharge and rain water collection.
<p>Solid and liquid waste</p>	<p>Lack of properly designed disposal mechanisms for solid and liquid waste may lead to contamination of surface and ground water resources. Already discharge of untreated liquid waste is polluting the surface and the ground water of the adjoining villages and FT project may aggravate situation.</p>	<ul style="list-style-type: none"> • Design a waste water treatment plant. • Incorporate solid waste storage area in the plan. • Need to discuss with Local Authority for immediate solution to garbage disposal until the composting program is established. Halt the open unregulated dumping practiced at the moment. • Coordinate with the MOH office Imbulpe and adopt measures to produce bio gas plant with zero emissions. Use the bio up flow digester for the purpose. Use the effluent water to irrigate the SUSL garden.
<p>Establishment of baseline environmental conditions prior to start of civil works</p>	<p>Non availability of a method to audit the impact. Obtaining a suitable and representative baseline data set will be critical to the whole monitoring and audit process because it forms the standard against which environmental impacts are assessed.</p>	<p>Conduct documentation of areas for construction zone (camp, staging, storage stockpiling, etc.) and surroundings (within direct impact zones). Include photos and GPS coordinates. Conduct base line monitoring in respect of ambient air quality, water quality, and noise levels as per monitoring plan.</p>

	<p>Impact of vibration noise, ground water pollution due to solid and waste water disposal etc.</p>	<ul style="list-style-type: none"> • Thus, baseline monitoring for water quality, noise, vibration will be audited prior to the start of construction and in site supervision.
<p>Utilities</p>	<p>Water line is under development.</p>	<p>-Contractor should prepare a contingency plan to include actions to be done in case of unintentional interruption due lack of water at the site.</p>
<p>Resources mobilization and allocation of space</p>	<p>Allocation of space for storage yard for construction material, labour camp, project office may require addition amount of space.</p>	<p>Adequate provision should be made on site to mobilize the construction equipment. If additional land is required, selection should be undertaken by the contractors carefully in consultation with OUS (within premises). Sitting of the construction camp shall be as per the guidelines below and details of layout to be approved by PMU. Potential sites, within the FT 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. Construction camp sanitation facilities shall be adequately planned. Selection of local un-skilled and skilled workers for the proposed construction activities can reduce the requirement of land for labour camps.</p>

		Use local materials as much as possible to reduce the need for storage space.
Disaster management	Extreme climate events such as intense rainfall during the (landslide), cyclone, tornado etc. and fire may cause damages to lives and property.	Adoption of appropriate disaster risk reduction strategy, emergency preparedness and recovery, training/orientation program for lecturers and students and construction worker, etc. Identify an emergency evacuation point in the building. An emergency alarm system has to be in place.
Safety of students and academic staff	Lack of safety measures within the design will lead to fire and increase occupational safety hazards	Plan for fire extinguishers, fire alarms and a stair case for emergency evacuations. Fire safety management and mock drill. Install lighting resistors since the project building will be located near a high tension wire.
Occupational Health and Safety	Unless worker safety is complied with, it can lead to injury and other health risks.	Contactor to comply with ADB Environmental, Health, and Safety Guidelines, ILO, Factory Ordinance to the extent that are applicable to workers contract. Develop and implement comprehensive site-specific health and safety plan y A management strategy and applying practices to eliminate, or minimise, fatalities injuries, and illnesses for workers performing activities and tasks associated with the project. Include in the health and safety plan measures Provide medical insurance coverage and indemnity for workers. The construction site will be properly barricaded by appropriate material
Public consultations	Unless regular consultations are carried out with the stakeholders	Continue information dissemination, consultations, and

	including community, issues that crop up during the project will go unaddressed leading to problems later on.	involvement or participation of stakeholders during project implementation.
Site Clearance, cut and fill operations and land preparation	<p>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.</p> <p>Such activities will potentially impact the ecological resources. Noise generated from construction will potentially disturb breeding, foraging, and migrating behavior of wild species in the Samanalawewa tank.</p>	<ul style="list-style-type: none"> • Only ground cover or shrubs and trees that directly affect the permanent works or necessary temporary works shall be removed with prior approval from the environmental expert of the PIU as listed in the ESMP. • Construction activities including earth work and construction of cross drainages should be conducted during the dry season. • Awareness programs should be organized for the workforce about the importance of flora, fauna and ecology of the wetland. • Contractor shall adhere to the guidelines and recommendation made by CEA and DS regarding removal of trees • Contractor should especially be aware not to introduce any alien species during construction related activities. <p>Saplings for tree planting program should comprise of native or endemic species.</p>
Drinking water availability at construction camp and construction site	<p>Scarcity of drinking water for labours will result in dehydration and health risk. (This is especially relevant during the period of water scarcity experienced in the project area). Chlorinated water from the university pipe line to be supplied to the construction site.</p>	<ul style="list-style-type: none"> • 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. The drinking water will be stored in a suitable size storage tank to ensure uninterrupted availability. • Contractor will submit his plan on ensuring water

		availability at the site for drinking sanitation and construction.
Use and transport of natural resources	Impact on the natural ecosystem by means of exploitation. Extraction, transportation and storage of construction materials may give negative impact such as noise, air, water, soil pollution, reduction of scenic beauty	<ul style="list-style-type: none"> • Extraction of construction materials should be undertaken only from mines and quarries approved by GS&MB • Environmental requirements and guidelines issued by the CEA, and LAs should be followed with respect of locating material extraction sites. • Sand, rubble, metal bitumen and cement should be covered to ensure protection from dust to avoid emissions.
On Site housekeeping	Lack of solid waste and sanitation management on site can lead to lack of general cleanliness and impact on ecology, public health and scenic beauty.	<ul style="list-style-type: none"> • Pre identified waste disposal site by the contractor should exclude areas which are close to public and sensitive environment (including forested areas and Samanalawewa Tank). • A solid waste management plan will be prepared by the contractor in consultation with local authorities • Make arrangements with the local authority on disposal of solid waste generated during construction. • 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. • Garbage bins should be provided to all workers based camps, and construction sites

Stockpiling of construction materials	Obstruction of drainage	<ul style="list-style-type: none"> • Stockpiling of construction materials will be done in such a way that it does not impact and obstruct the drainage. • Stockpiles will be covered to protect from duct and erosion.
Air pollution, Noise pollution water pollution	Environmental pollution	<ul style="list-style-type: none"> • 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 gazetted 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 • Contactor to carry out a monitoring plan on water , air and noise . Refer ESMP for details.
Onsite emergency plan for minor accidents and mishaps.	Absence of plan will lead to death to the worker and economic cost to the project	<ul style="list-style-type: none"> • Onsite emergency management plan will be prepared by the contactor with the consultation of the PIU.
Clearing of construction camp and restoration	Unless site is cleared it will not be visually pleasing and would lead to health risk.	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.

Landscaping	In the absence of proper landscape, it will not be aesthetically pleasing. Landscaping should blend in with the surrounding ecosystem.	<ul style="list-style-type: none"> • Project landscape activities have to be done as per either detailed design or typical design guidelines. • Plant floral species that are native to the area. <p>Carry out a resonance survey of floral species native to the area or contact Forest Department/Agriculture Department to identify the recommended species and plant</p>
Operational Period		
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 ng plan through an approved monitoring authority.
Drainage Congestions	Stagnation or blocking the water flows may occur due to sediments, improper disposal of debris during maintenance activities or ignorance. This will provide suitable habitats for vectors like mosquitoes etc. In the absence of a proper storm water drainage system there will be a risk of water logged conditions around the site.	<ul style="list-style-type: none"> • University needs to undertake regular maintenance of the drainage system to avoid drainage congestions. • Employ staff to clean the drains and make sure that outfall is not blocked.
Water supply to the building	Unavailability of water for the university premises will increase the risk of health and hygiene of the students. This will interrupt their academic work. There is a shortage of water experienced at the moment.	Supply of water through the WASIP project of the NWRB. This will be completed in 2019 Chlorinated water to be supplied through the current intake of at all time so that students health would not be at risk
Solid waste management	At the moment solid waste collection is done twice a week, there is risk of solid waste piling up on site and obscure the environment	Adopt an agreement with the LA and a waste management plan in place. Adopt the composting program that is funded by CEA.
Domestic liquid waste disposal	Lack of proper disposal of domestic waste water will result in environmental pollution and groundwater contamination.	Establishment of a treatment plant and ensure that the treated waste water conform to the standards under CEA.

	Currently, there is an issue to the surrounding village community. Sludge is openly disposed to the cement tank creating a health risk and also leachate is said to be contaminating surrounding water ways.	Consult the Imbulpe MOH office. Treated waste water to be used in irrigation of garden.
Health and safety of the students	Activities such as Laboratory work may result in accidents injury among students due to faulty connection in the electricity and wiring Social conflict with the surrounding residents and worker in other establishment due to unacceptable behavior of students	Train the students and teachers on managing risk and emergencies. Provide emergency switches to prevent fire hazards Place rules and regulations and code of social conduct that is required to be maintained by the student
Onsite emergency plan for minor accidents mishaps and disaster management plan.	Damage to the property and life in event of a disaster event.	(a) The FT 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 tornados and cyclones.
Maintenance of plantation and landscaped area in the FT project site	In the absence of maintained landscape FT grounds will not be pleasing to the eye	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. Plant species that will enrich the habitat for the existing flora and fauna identified by RBA.
Food safety	Unhygienic food preparation conditions may lead to health issues in the cafeteria.	Adopt rules on personal hygiene. Adopt food safety regulation to the cafeteria which is imposed by the Ministry of Health. Obtain EPL from CEA if Canteen sizes exceed 50 persons.

41. The budgetary provision for the implementation of the environmental management plan of the FT can be categorized in to two types and is presented below
- i. Environmental Management Plan Works to be implemented by the contractor under civil works contracts
 - ii. Environmental Management Plan Works to be implemented by the FT project management unit
42. A capital cost provision of about **Rs. XXX has** been kept towards implementation of environmental management plan. 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. The ESMF monitoring and implementation costs are provided in Table G11.

Table G11: Cost estimate

Component	Description	To be implemented by	Amount (Rs)
A	Mitigation / Enhancement	Contractor	
B	Environmental Monitoring		
Subtotal			
C	Training and mobilization	FTP project management unit	
D	Meeting		

43. In order to ensure effective implementation of safeguard related components in the project PIU at FT will include a safeguard expert (an environmental cum social expert) /Assistant Environmental Officer in the team. This safeguard expert will ensure

- compliance with ESMP and IEE requirements, and implementation of environmental management plan of -project at site through contractor.
44. In order to ensure effective implementation of safeguard related components in the project PIU at FT will include a safeguard expert (an environmental cum social expert) in the team. This safeguard expert will ensure compliance with ESMP and IEE requirements, and implementation of environmental management plan of -project at site through contractor.

H. Public Consultation (PCM)

45. The following are the major points of concern of the participants of PCM
- On obtaining the relevant approval from the concerning authorities such as irrigation department, UDA, Imbulpe Pradeshiysa Saba
 - Solid waste disposal associated with the project
 - Waste water management of the project
 - Issue of environmental pollution concerning solid and waste water waste disposal
 - Improvement of the drainage in the canal system associated with the project
 - Disturbance due to project work for the surrounding community
 - Stakeholders are concerned about the increased noise level during construction. Placing the pedestrian crossing traffic light on the Colombo - Batticaloa highway, proper road signage and speed control measures are the most sought after road safety measures by the stakeholders.
 - Establishment of a boundary wall acting as noise barriers along the FT premises was positive received by all of the participants. The stakeholders felt construction of boundary will also provide the security to the undergraduate and should be implemented before the commencement of construction activity to safeguard the worker and prevent noise and disturbance on the nearby residence

I. Conclusion and Recommendations

46. **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. The GRM and ESMP provide appropriate

- guidance for suitable environmental and social safeguards. Accordingly, the proposed project can be recommended for implementation with strict adherence to ESMP and GRM provided in this IEE.
47. Most of the adverse impacts of FT during construction period are short term and temporary in nature. These impacts can be minimized through specific engineering and management solutions. Environment friendly construction methodology has been incorporated into the project design and the ESMP has been prepared to minimize the overall impacts on the environment during the proposed project civil works. However, there is a significant patch of forest within the project area that is rich in biodiversity that needs to be conserved and enriched since there a few vulnerable and threatened species.
48. SUSL has some serious issues concerning waste management that need to be addressed at the on set of the project so that the situation is not further aggravated as a result of the FT. Consultations with the local authorities established the fact that solid waste is openly disposed without any form of regulation and it is unsorted. Measures should be adopted to develop a solid waste management plan prior to construction of FT. Waste water from the SUSL is currently unregulated and disposed to the adjoining surface water bodies and have caused degradation of local waterways. SUSL needs to consult the Imbulpe MOH and work with them to address this issue. The septic sludge is disposed into an open pit which is a health hazard for the student community and the residential community.
49. **Recommendations:** The ESMP has been prepared incorporating various modern technologies and guidelines to reduce the environmental impacts of project constructions to make it a Green building. Therefore, it is recommended that the ESMP and associated Guidelines during construction and operation phases of the project are strictly adhered to. SUSL need 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.
50. SUSL should engage with NBRO for measures to prevent landslides and, CEA and the UDA to incite the green building designs.

51. SUSL should consult the Meteorology Department prior to construction and obtain records of the wind flow and design the building accordingly.
52. The SUSL will have to obtain an EPL for the canteen that will cater for more than 50 students through CEA.
53. FT of SUSL has already entered into an agreement under the solid waste management project called “Plisaru Project” with CEA. Until this is established, sorting of waste should be practiced within the university premises. The Imbulpe PS should be consulted.
54. Consult local MOH office and address wastewater leachate issues being taken up by the community.
55. Review the biodiversity assessment on the floral section and adopt measures to protect and conserve atleast a designated area (a forest patch). Other areas should be enriched through landscaping to support the native and endemic species. This area is significant in terms of biodiversity protection status.
56. Carry out the environmental monitoring as planned in the ESMP prior and after construction and operation.
57. Water is a limiting resource for SUSL during certain dry month of the year therefore coordinate with the WASIP NWRDB for the implementation of this project.

1 INTRODUCTION

1.1 Project Background

58. 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 2015¹. Successive governments in Sri Lanka have promoted the concept of a ‘knowledge based economy’, particularly during the past two decades^{3,4} (Mahinda Chinthana, 2005, A Powerful Sri Lanka, 2016).
59. 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 industries⁵. 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.
60. 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 Highways (MOHEH) shall be the Implementing Agency and the University Grant Commission shall be the executing agency for the Project. This project aims to increase the technology oriented work force which will contribute to transform Sri Lankans growing economy. Under this Project the SUSL will build a new Faculty of Technology (FT) in Sabaragamuwa. This will be referred to as the project in this report.
61. The safeguards screening for SUSL has been completed by the consultants mobilized under TA8235 with recommendation for a biodiversity assessment if there are future expansion.

³ Mahinda Chinthana, 2005, Government of Sri Lanka

⁴ An Empowered Sri Lanka, 2016, Government of Sri Lanka

⁵ The skills gap in four industrial sectors in Sri Lanka, 2015, International Labour Organisation

62. The project proponent (PP) of this project is FT project implementation unit (PIU) at SUSL. The proposed feasibility study and the detailed designs of the FT at SUSL for Phase 1 includes the following:

- Chemistry lab (100 students)
- Physics lab
- Biology lab
- Staff rooms
- Departments
- Dean office
- Reading room
- Student common room
- Auditorium
- Computer admin office
- Staff common/dining room
- UI Collaboration center
- Library
- Exam halls
- Cafeteria
- Security office

63. The FT will train graduates who are ready for industries such as bio system technology and engineering technology services. This will ensure that these graduates will have a competitive edge to secure jobs both locally and internationally.

64. 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.

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 Offered												
Bachelor Engineering	75	75	75	75	100	100	100	100	100	100	120	

e l o r s	Biosystem Technology	75	75	75	75	100	100	100	100	100	100	120
	Engineering Technology					25	25	25	25	25	30	30
	Biosystem Technology					25	25	25	25	25	30	30
P h D	Engineering Technology							5	5	5	5	8
	Biosystem Technology							5	5	5	5	8

65. 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. This will ensure that these graduates will have a competitive edge to secure jobs both locally and internationally

1.2 **Objectives of the IEE**

66. The objectives of the Environmental Study are to:

- i. Determine the category of the project 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;
- ii. Determine the appropriate extent and type of EA required (IEE or EIA), i.e. scoping;
- iii. Determine the requirement of statutory clearances;

- iv. Provide a baseline environmental monitoring and survey; on biodiversity, biophysical resources
 - v. Predict impacts on relevant environmental attributes and mitigation measures to minimize the impacts; and
 - vi. Prepare IEE Report including ESMP
67. Recommendations will be provided for mitigating any negative impacts wherever possible through the ESMP. The ESMP 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 project anticipated environmental impacts that will arise due to project activities, necessary measures that have to be adopted to mitigate them and public views and suggestions regarding the project.
68. Accordingly, a single consolidated IEE report will be submitted to ADB and also be made available to the PP to facilitate their decision making.

1.3 **Approach and Methodology**

69. 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.
70. **Reconnaissance Survey:** A reconnaissance survey was carried out identify the value environmental components surrounding the project. Location of environmentally protected areas; surface water bodies; environmentally sensitive receptors (educational institutions, religious structures, medical facilities etc.) at the project site was identified during the survey. The Consultant conducted preliminary analysis of the nature, scale and magnitude of the impacts that the project is likely to cause on the environment, especially on the identified Valued Environment Component (VECs). REA, IP and IR checklists (refer Annex 3) were filled out and the findings incorporated in the preparation of the IEE. Site inspection of proposed project was carried out on 23rd March 2017 (refer Annex 04 for details).
71. 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 project. This will be carried out by ADB separately.

72. **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 & guidelines of ADB and Ministry of Mahaweli Development and Environment (MOMDE).
73. **Environmental Screening & Scoping:** Screening has been conducted with specific consideration such as location of the projects with respect to flood risk and critical issues to be studied in detail as well as provide important feedback to the design / technical team. 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.
74. **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 project 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 project site by the SUSL.
75. **Stakeholder Consultation:** At the onset of designing the SUSL technology degree program, a consultative committee was formed which consists of senior academic members in the field and representatives from professional bodies. Stakeholders' workshop to analyze the technology degree program offered at SUSL was organized on the 01st of May, 2018 and held at the Board Room of the Vice Chancellor's office (refer annex 05 for details). 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.
76. **Analysis of Alternatives:** The environmental analysis of alternatives mainly focuses on location, building design if any, sources of designs from an environmental

management perspective to reduce impact on archeological, biodiversity, environmental pollution and cyclones.

77. **Prediction of Impacts & Mitigation Measures:** Based on the above study potential positive and negative impacts on land environment, air environment, noise environment, water environment and biological environment has been assessed for both construction and operation phase. For each impact predicted, feasible and cost effective mitigation measures has been suggested to reduce potentially significant adverse environmental impacts to acceptable levels.
78. **Environment Management Plan:** The ESMP (Part III) has been prepared as per the requirements of ADB safeguard policy statement. The ESMP includes management of construction camps; impacts of construction such as dust and noise; rain water harvesting, storm water management practices; establishment of a waste water treatment plant & solid waste management plan; flood control; essential clearances; etc. At the same time, information was collected to prepare a Basic Information Questionnaire (BIQ) for environment clearance from CEA (refer Annex 06,).

1.4 **Structure of IEE Report**

79. 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:

80. **Part I. IEE Report**

Executive Summary

Chapter 1- Introduction

Chapter 2-Policy, Legal, and Administrative Framework

Chapter 3-Description of the Project

Chapter 4-Description of the Environment (Baseline Data)

Chapter 5-Analysis of Alternatives

Chapter 6-Anticipated Environmental Impacts and Mitigation Measures

Chapter 7-Public Consultation

Chapter 8-Environmental Management Plan

Chapter 9-Conclusion and Recommendation

Part II. Annexes

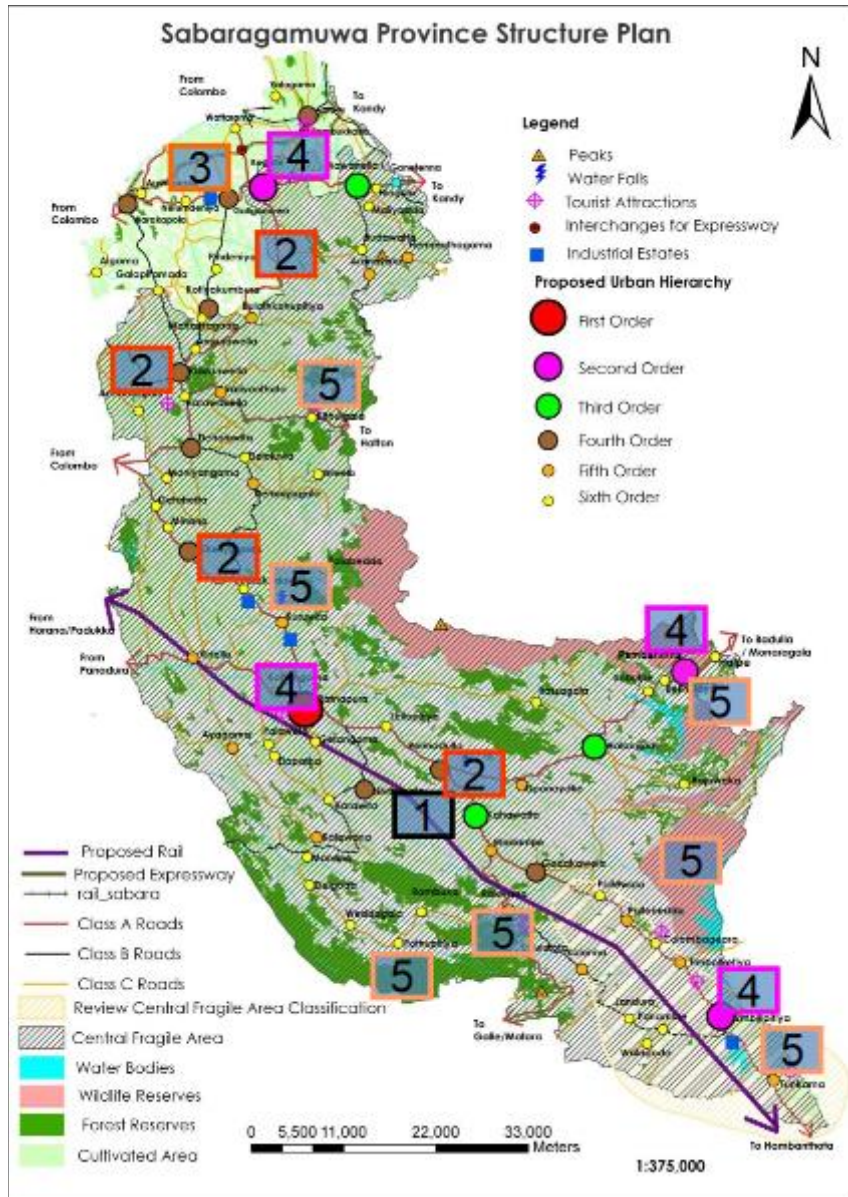
Part III. ESMP

2. DESCRIPTION OF THE PROJECT

2.1 Project Location

81. The proposed construction of the new FT is located in Imbulpe Rathnapura District, and Sabaragamuwa Province, Sri Lanka. The project site (i.e. land) is located alongside the Colombo Batticaloa highway (A-4), 593m from the Pabmahida junction and 1.46 from Belihul Oya town. The government granted the university approximately 232 acres as below. The project areas is about 6 acres and is a secondary forest.(refer annex 7)
- 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 (water pumping and purification unit, hostels, Nature Park and reserve)
82. Adjoining properties are privately owned for residential and commercial purposes or government owned. The project side is in an urban center zone according to the Sabaragamuwa provisional zonation plan by NPPD. The FT project location is marked in Figure 04.

Figure 1: Sabaragamuwa Provincial structural Plan

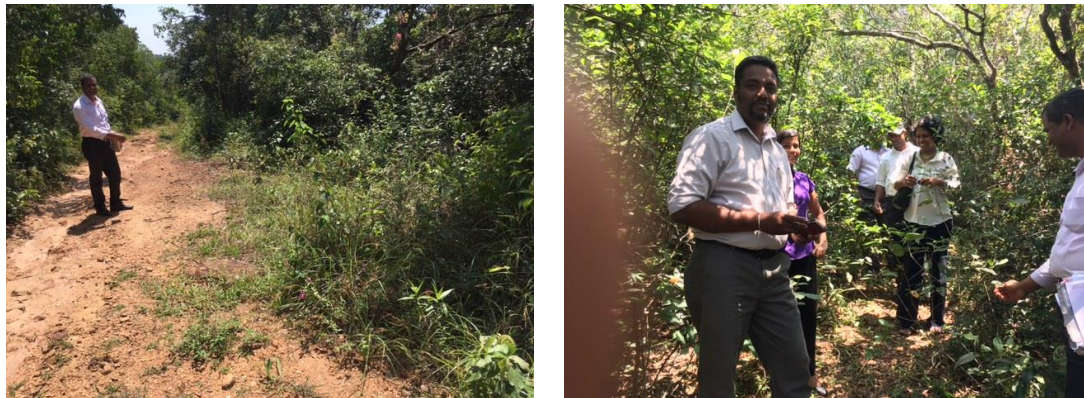


83. The proposed project site is situated within the existing University premises. The land location points are $6^{\circ}42'33.33''N$, $80^{\circ}47'35.17''E$. The land is rectangular in shape. Adjoining properties are currently not developed. There are no permanent or temporary structures at the project site. Some photos of the site are shown in Figure 2. The land

which was under state ownership was transferred by the government to the University. This land was formerly used for the Samanala Wewa Dam project. Gazette notification is provided in (Annex 8).

84. The land is composed as one plot in the survey plan. 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 09). The way to the proposed site is shown in Figure 3.
85. The land is 18 km from the Balangoda town. Samanala wewa reservoir which is 3km from the site is one of the closely located biologically rich sites. Other sites include Horton Plains (3.7 km), Adara Kanda (3km) and Dethanagala mountain range (3.5km) to the site. The site map with the respective distance are shown in Figure 4.
86. The site is composed of a low canopy sparse vegetation dominated with “Spicate Eugenia” (*Syzygium zeylanicum*) and with some other shrubs, herbs, orchids and ferns. Further, few tree species found dbh exceeding 10 cm. Typical savannah vegetation does not exist in this area as most of the vegetation was highly modified due to climate and windy conditions.

Figure 2: Plates of project site

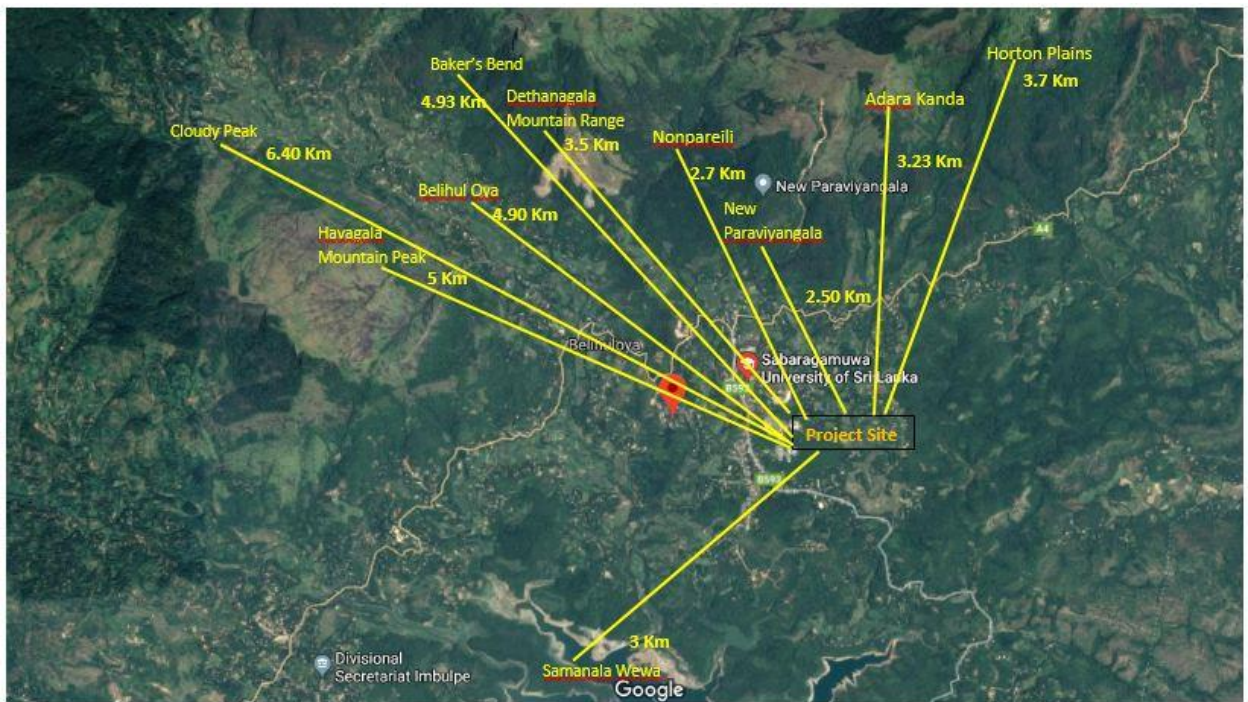


Source: Captured by TMS

Figure 3: Way to proposed site



Figure 4: Project location seen as plantation area with 80% green cover with respective distances to the SUSL



2.2 Description of the Project

87. 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 is determined based on the requirement provided by SUSL. The details design and the lay out plan for the FT. The proposed new faculty buildings will be designed according to modern architecture designs. The laboratory facilities involves 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 development of the faculty buildings will be carried out in three separate phases. In the first phase, will include completion of the four story building which consist with 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 ([Refer Council Layout Map Annex 10](#))
88. The project will be constructed as three phases and they are as follows.
- i. Phase I
 - ii. Phase II
 - iii. Phase III

The details of the requirement proposed by SUSL for the FT are given in Table 2

Table 2: provided detail specification of some of the laboratories that have been proposed in the academic building.

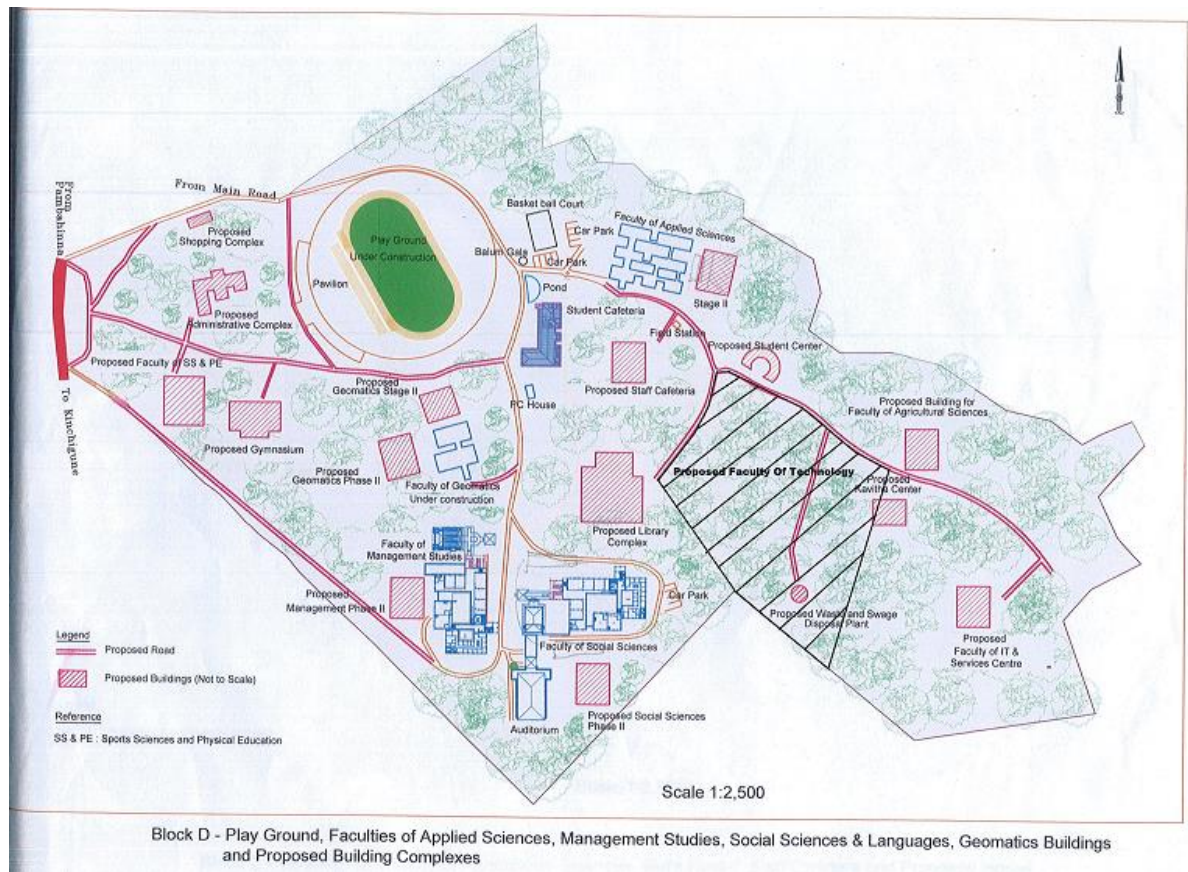
Indicative requirements for Buildings (Technology Faculty)- Phase 1			
Spaces	Seating Capacity	Floor Area in Sq. F	Number of Rooms
Class rooms	100	2000	4
Computer laboratory	100	3000	1
Chemistry lab (100 students)	100	3400	1
Physics lab	100	3120	1
Biology lab	100	4650	1
Staff rooms	1	120	24
Departments	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
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	

89. At the moment the SUSL has not appointed any architect for the detail engineering designs. Only available information is the estimated details prepared by the FT staff at SUSL.

Figure 5: Master Pan



90. The site plans and 3D views will be developed later. At the time of this IEE preparation the detailed layout plan was not available.
91. 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.
- a. **Culvert:** There is a culvert across the access road leading to the project site. Considering the hydrological requirement, some additional culverts and replacement of some culverts would have to be proposed for the project.
 - b. **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 pavements.
 - c. **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.
 - d. **Land Acquisition:** SUSL has secured adequate land to build the faculty. Project will be built on 6 acre land which is owned by SUSL. The whole land of SUSL was given by Government.
 - e. **Demand analysis study:** Detailed analysis on demand for graduate students will be carried out to justify the public investment for the FT project will be carried out as a separate assignment by ADB. It will 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 project.
 - f. **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 centered 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.

92. 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 private sector in Sri Lanka It will encourage specialists from private 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,

93. **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.

94. **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.

95. The building should have fire safety mechanisms installed to ensure fire compartmentation, separation and fire suppression. 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.
96. **Sources of Construction Materials:** Soil and material investigation for a FCTP 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.
 - a. **Borrow Areas:** Potential sources of earth for the construction of embankment and soil infilling needs to be identified by the consultant design engineers and the contractors for the project at SUSL. The suitability of borrow materials can be checked by laboratory tests such as proctor compaction test, gradation test, liquid limit plastic limit etc.
 - b. **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.
 - c. **Cement block & clay bricks:** these should be tested according to SLS 847 and SLS 39 for compressive strength, dimensions and water absorption.

- d. **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.
97. **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.
98. 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.
99. **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. There is no government contribution for the project.

Table 3: Cost Estimates for Faculty of Technology Advanced Procurement -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

3. POLICY, LEGAL, AND ADMINISTRATIVE FRAMEWORK

3.1 Applicable Measurable Environmental legislations

100. 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.
101. 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 11. This project comes under the purview of the following sector level Acts. The EPL procedure under the CEA is explained in Annex 11 along with the rest of the laws that are listed below
- a) The Constitution of Sri Lanka (Articles 18, 27(14), Articles 154 (A), 9, 19 and (III) 17)
 - b) National Environmental Act No. 47 of 1980 (and its amendments of 1988) EIA is covered under this Act
 - c) Disaster Management Act No. 13 of 2005
 - d) Pradeshiya Sabha Act No. 15 of 1987
 - e) Flood Protection Ordinance, Act No. 22 of 1955
 - f) State Land Ordinance, Act No. 13 of 1949
 - g) Soil Conservation Act, No. 25 of 1951
 - h) Mines and Minerals Act No. 33 of 1992
 - i) Fauna and Flora Protection Ordinance, Act No. 49 of 1983
 - j) Forest Ordinance, No 17 of 1907 (and amendments)
 - k) National Water Supply and Drainage Board Law of No. 2 of 1974
 - l) National Policy for Rural Water Supply and Sanitation of 2001
 - m) Prevention of Mosquito Breeding, Act No. 11 of 2007
 - n) The Urban Development Authority, Law, No 41 of 1978

- o) Municipal Council Ordinances and Acts – Urban Council Ordinance 61 of 1939, Act 29 of 1947, Act 18 of 1979, and Act 13 of 1979
 - p) Land Acquisition Act No. 09 in 1950 and subsequent amendments in 1983 and 1986 Land Acquisition Regulations of 2008
 - q) National Environmental (Amendment) Act 47 of 1980 and its amendments
102. 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).
103. 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.
104. 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.
105. **Conclusion:** 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. For this purpose the filled BIQ is in Annex 6.

106. National laws and regulations that can be relevant to the project are briefly described in Table E4. Details on these applicable laws are covered in Annex 11.
107. **ADB Safeguard Policy Statement, 2009.** The Asian Development Bank has defined its Safeguard requirements under its ‘Safeguard Policy Statement 2009 (SPS 2009)’. The prime objectives of safeguard policy are to: (i) avoid adverse impacts of projects on the environment and affected people, where possible; and (ii) minimize, mitigate, and/or compensate for adverse project impacts on the environment and affected people when avoidance is not possible. This policy requires assessment, mitigation and commitment towards environmental protection. The extent of assessment depends on the category of the project. ADB’s SPS 2009 classify a project depending on following three 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.
108. **Conclusion:** The proposed project cause environmental impacts which are less adverse in nature and few of them are reversible and mitigation measures can be designed more readily for the identified impacts. To assess the impact the REA, IP and IR Checklist of ADB was followed as per the ADB’s Safeguard Policy Statement the proposed FCT project of UOR has been classified as Category ‘B’ project requiring Initial Environmental Examination (IEE).

- a. It also aims to identify any potential negative environmental or social impacts in the immediate vicinity or surrounding areas that maybe short term or long term. Accordingly a single consolidated IEE report is submitted for ADB to facilitate their decision making Clearances required for the Project.
- b. Summary of the statutory clearances required for the FCTP is presented in Table 4.

Table 4: Statutory Clearances required for the Project

Type of Clearance	Activity	Authority	Timeframe
Environment Clearance (Environmental Protection Licensing) Regulation No. 1533/16of 2008	Implementation of the project and waste water treatment guidelines.	CEA	Before construction
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 01)	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

109. Apart from the clearances for the overall project work, the contractor, before starting the construction work, has to obtain required Clearances listed in Table 5. 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 Clearance	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 29 of 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 Pradeshiya 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- <ul style="list-style-type: none"> • 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 Shop and Office Employees (Regulation of Employment and Remuneration) Act, 1954 Factories Ordinance, 1942 2010 on fair treatment

110. 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.
111. 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 centre so made by the local authority.
112. 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 6 provides the 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

113. 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. The contracts for the civil works of this project are expected to be awarded by **XXX. DATA NOT AVAILABLE AT THE TIME OF REPORTING.**

1.5 Administrative Framework

114. **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.

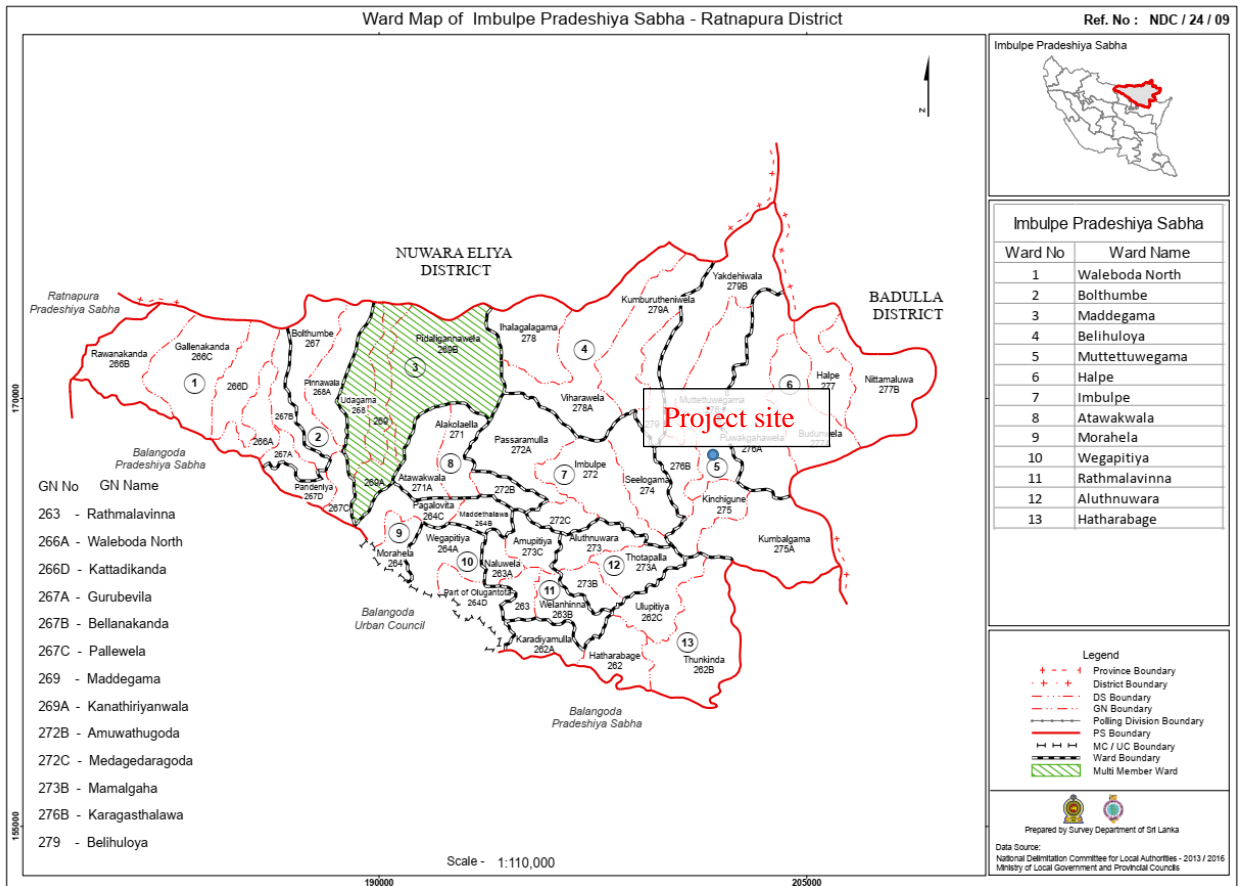
115. CEA advise the MOMDE on matters concerning prevention, control and abatement of water and air pollution; coordinate the activities of CEA & provide technical and research assistance; prepare manual, codes, guidelines & standards etc.

116. Sabaragamuwa University of Sri Lanka will be required to obtain an environmental recommendation letter or EPL from CEA. The NEA regulations stipulates that canteen facilities which provide seating capacity for over 50 students at a time fall under EPL category B.

117. 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 6- BIQ has been filled out and ready to be submitted to CEA for environment clearance).

118. Coordinate with the Department of Meteorology on the windy conditions. Study conditions and incorporate these findings to the details in to the FT design.
119. During all stages, consult the NBRO on establishing buffer zone to protect the area from possible land slide risk. Carry out revision on the geotechnology report once the lay out plan is available to evaluate the load transferred to the bed rock etc.
120. The domestic waste water that will be generated during the operation of the university has been collected and disposed to a septic tank at regular intervals. The gully bowsers operated by the university has discharged the sludge into 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. Before discharge, treated water quality should conform to regulations No. 1534/18 dated 01.02 .2008.
121. Coordinate with the Ibulpe Pradeshiysa Saba on the soild waste disposal until the CEA Pilisaru waste management project is implemented. Impulpe Pradeshya saba has been declared as an urban center and is govern by the Pradeshiya Sabha Act No. 15 of 1987. The boundary demarcation of Ibulpe Pradeshiysa Saba are shown in Figure 6)

Figure 6: Boundary Demarcation of Ibulpe Pradeshiya Saba



122. Water has been a scarce resource and certain instances the university was compelled to close. Therefore calculate the water requirement for the new FT and the new student population. Coordinate with NWSDB on implementation of the WASIP water project and obtain a letter of approval stating that the university will be given water from this project.

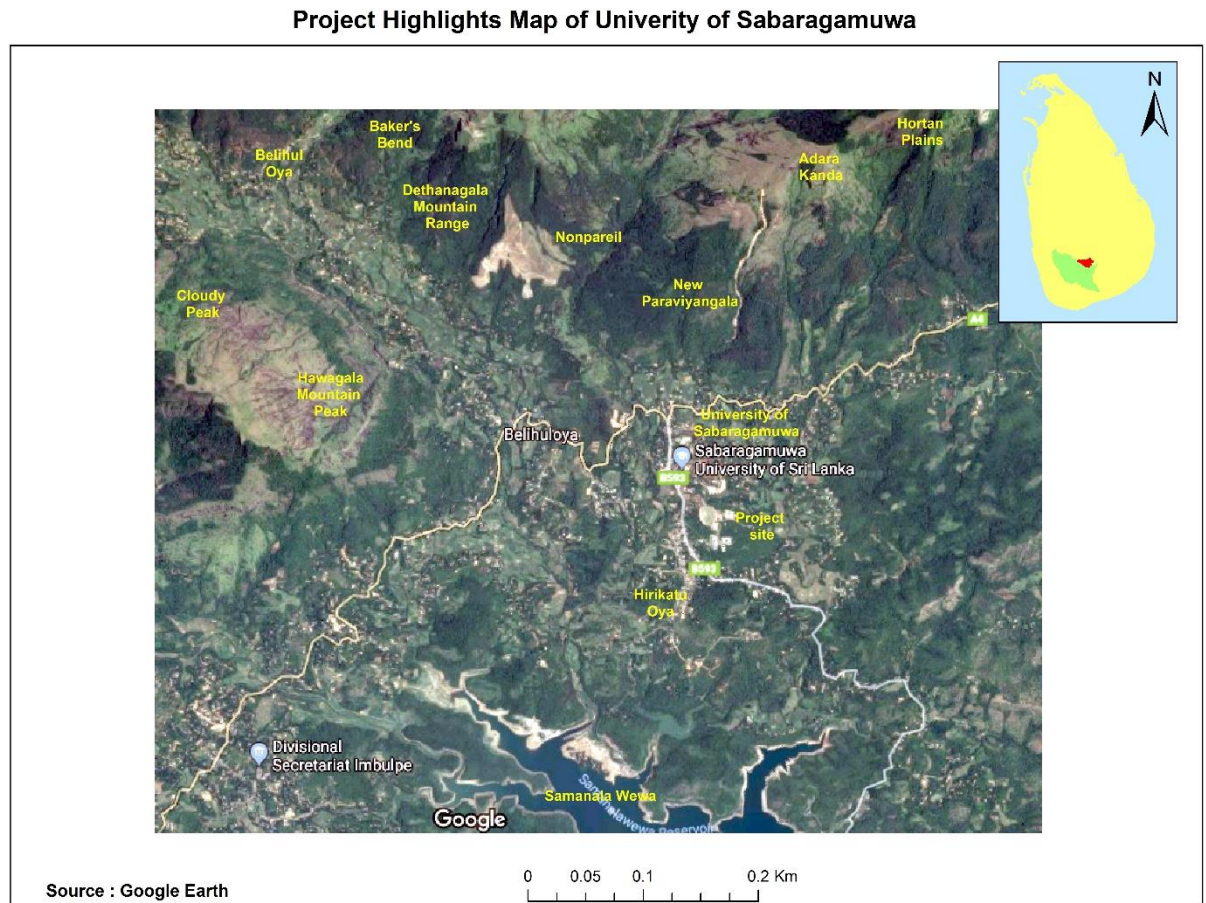
4. DESCRIPTION OF THE ENVIRONMENT

2.1 Methodology used for Baseline Study

123. Data collection and stakeholder consultations. Data for this study has been primarily collected through comprehensive literature survey, discussion with stakeholder agencies, and field visits to the proposed subproject site.
124. The literature survey broadly covered the following;
- i. Project 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.
 - ii. 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. Several visits to the project sites were made during IEE preparation period between March 2017 to May 2018 to assess the existing environment (physical, biological) and gather information with regard to the proposed sites. A rapid biodiversity assessment was done at the selected site as it is situated in a high diversity area of the country.
 - iii. 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. Other reliable information was collected from villagers and respective authorities during public consultation meetings
- Location Area and Connectivity
125. Geographically, the project area is located at 6^o42'33.33"N, latitude and 80^o47'35.17"E longitude in the Imbulpe Pradeshiya Saba limits of Rathnapura District, Sabaragamuwa Province. The Project is located in the Imbulpe Division that covers an area of 23,140 ha. Imbulpe Divisional Secretariat consists of 50 Grama Niladhari Divisions. The project area comprises Pambahinna and Belihuloya.
126. The project 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. 5.5km to Hindu temple (Aluth Nuwara Katharagama Dewalaya), 5.5km to the Imbulpe DS Office, 5.8km to Imbulpe sub post office, 2.5km to the Belihuloua post office and 1.33km to the People's Bank.
127. The Colombo Batticaloa A4 highway connects the university to the main road though B 593 -Pambahinna-Kumbalgama-Rajawaka-Kapugala Rd which is 23 km long maintained by RDA which serves the Samanala Wewa dam and the power station. The A4 road cuts across Belihuloya - Pambahinna area to destinations like Beragala, Haputale, Badulla, Nuwara Eliva. It is 1.46km from Belihul oya town. Imbulpe Division is one of the key residential areas located 10.5 km from the Balangoda town.
128. Idalgasmulla railway station is 13 km from the project site. The project area is 1km from the Pambahinna junction. Project road predominately traverse through plain terrain passing the newly built Faculty of Applied Sciences. Refer Index Map - Figure 7 for location.
129. There are several crucial environmental challenges facing the Imbulpe DSD including improper land use planning, improper solid and liquid waste disposal, water pollution due to unregulated disposal of waste and agricultural activities. Disasters associated with heavy rain and landslides. Tornadoes are also common to this area.

Figure 7: Map show the location of the project and the surrounding



Source: Prepared by TMS

- Land Use

130. The total land use coverage in Imbulpe is 23,140 ha. The land use system of the Muththettuwegama is dominated by home gardens (55.5 ha), Grasslands (658 ha), Scrub (403 ha) and forest (270.34 ha). The paddy land consist in Muththettuwegama GN is 153.86 ha, rubber 4.48 ha, tea, 6821 ha, chena 62.20 ha, and 33.16ha accounts for other plantations. Hirikatu Oya and its tributaries cover 25.80 ha. Table 8 highlights the land use patterns in the Muththettuwegama GND.
131. Before urbanization occurred, Imbulpe was composed of forest cover. The land use pattern in the project area today, is residential with predominately mixed development.

Project surrounding land (Muththetuwagama 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 Muththetuwagama 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.

Table 7: Land use Pattern observed in the Muththetuwagama GND

Land use Muththetuwagama 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

- **Seismicity**

132. The project is located in the Sabaragamuwa province of Sri Lanka which is not an active seismic region. The area does not have any potential risk of damage due to earthquake. However the stability of the bedrock and peat soil should be considered during building design.

- **Geology, Soil and Topography**

133. The location is in the Imbulpe Divisional Secretariat which is geologically composed of gravel (Quiet Sight, Granite Niaz, Janokayit, Marble and Unclassified highlands).
134. 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 vegetation⁶. Conditions of the sub surface layer include the following

Layer 2a - Dense to very dense silty SAND/sandy SILT

Layer 2b – Washing sample

Layer 3a – medium dense to very dense silty SAND/ sandy SILT (completely whether head rock)

Layer 3b – Highly Weathered insitu Boulder

Layer 4 – Weak GARNET BIOTITE GNEISS

135. 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.

136. **Conclusion** 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 rainfall⁷ (refer details on geo technical report Annex 2 soil report).

- **Climate and Meteorology**

137. **Climate conditions in the study area:** 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

⁶ June 2018 Soil investigation report for the proposed building for faculty of technology phase I

⁷ June 2018 Soil investigation report for the proposed building for faculty of technology phase I

- 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.
138. It will be seen that the area is subject to a minimum rainfall of around 1400 mm per year with a maximum of over 2000 mm per year. June, July and August generally is considered a dry period with rainfall averaging 96 mm per month⁸.
139. **Temperature:** The average annual temperature is 26⁰C, with a low of 18⁰C during the months of December and January. The humidity factor is negligible. Overall, the temperature in the area does not create any discomfort and is well suited for outdoor recreational activities. The hottest months in Belihul Oya are June, May, and then July. See average monthly temperatures below. The warmest time of year is generally late May where highs are regularly around 27.7^oC with temperatures rarely dropping below (18.2^oC) at night⁹.
140. **Humidity** Low humidity and a non-polluted atmosphere with well tolerated temperature levels common to this area. Belihuloya has some extremely humid months, with other comfortably humid months. The least humid month is July (56.6% relative humidity), and the most humid month is December (82.1%)¹⁰.
141. **Wind speed and direction:** An average wind speed of 31 km/h has been recorded during the months of June to September. Although at times winds may appear somewhat gusty in the area. The wind blows in from the north west of the study area ¹¹. The windiest month is July, followed by June and August. July's average wind speed of 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) are at their highest in mid July where average top sustained speeds reach 11.3 knots, which is considered a moderate breeze¹². In 2016 Halpe, Belihuloya, 12 houses were damaged, injuring several children¹³.

⁸ K.V.D. Edirisooriya Manike Masters thesis on Recreational potential of Belhu oya Pabahinna area 2000.

⁹ <https://championtraveler.com/dates>

¹⁰ *ibid*

¹¹ K.V.D. Edirisooriya Manike Masters thesis on Recreational potential of Belhu oya Pabahinna area 2000

¹² <https://championtraveler.com/dates>

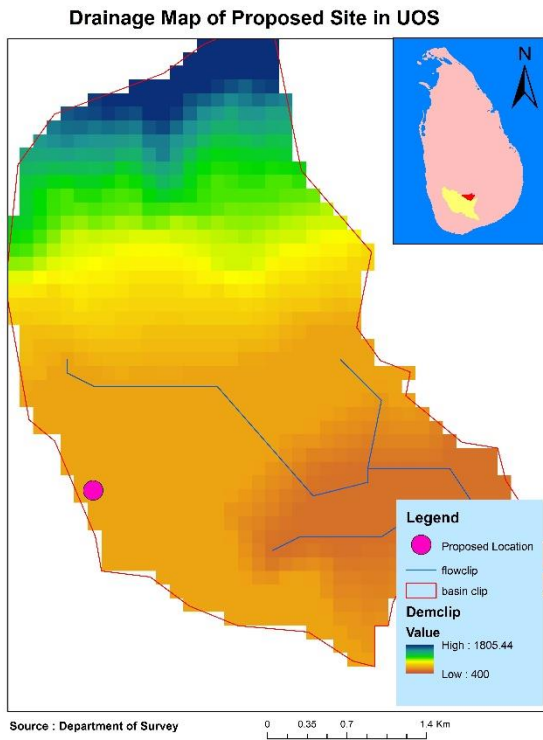
¹³ One man killed, houses damaged in strong winds Sunday times Sunday, July 13, 2014

142. **Conclusion:** Proper recording and assessment has to be carried out with the Department of Meteorology. Therefore engage with the department to assess the wind condition prevalent in the area and incorporate wind resistance to the building design.
143. **Drainage and the River Systems:** The project 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 14 show the surroundings of the stream). Kirikati Oya is also not far from the university premises. University is located in the upper reaches of the Udawalawe tank cascade system.

Figure 8: Hirikatu Oya

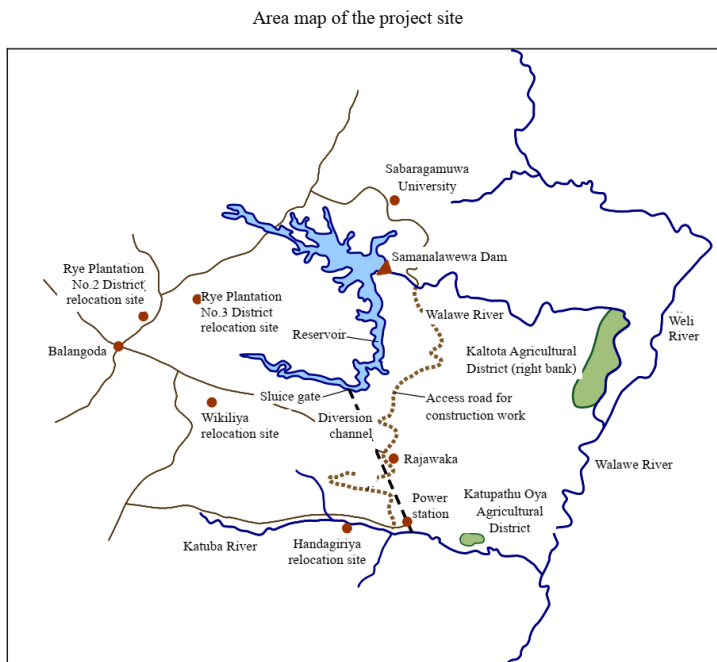


Figure 9: Drainage map of proposed site



Source: Prepared by TMS

Figure 10: Area map of project site



- **Ambient Air Quality**

144. To draw up a baseline status of the ambient air quality the SUSL will take the measurements prior to the commencement of the development project.
145. 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.

- **Surface and Ground Water Quality**

146. The Belihuloya - Pambahinna area has fresh water resources in the form of waterfalls, reservoirs, rivers and streams¹⁴. *Belihuloya has an abundance of waterfalls including the highest, the Bambarakanda Ella*. 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 11: Common surface waters in the region



147. Ground water table was not observed by during the period of borehole investigation. Depth of the water table was not measured.
148. **Water supply :** 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. The water from Hirikatu Oya had been obtained direct to the tank and distributed by mixing with chlorine

¹⁴ K.V.D. Edirisooriya Manike Masters thesis on Recreational potential of Belhu oya Pabahinna area 2000

thereafter. According to the 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 quality. As such the supply of pure water fit for drinking to about 7,300 students and the staff of the University had become a problem. By May 2017, construction of the tube well remained partly constructed¹⁵.

149. **Conclusion** 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 University. The project which was initiated in 2017 has only completed 8.8% though the completion dates are scheduled for 2019. This will have to be closely followed up.

- **Ecology and Biodiversity**

150. **Introduction:** A rapid bio diversity assessment was carried out in May, 2018 to assess whether there were any threatened or endemic species within the project area (see Annex 12 for report). The study area is a patch of moist semi-evergreen forest land located in the Eastern Intermediate Zone of Sri Lanka. Figure 12 shows sampling points.

¹⁵ Auditor Generals report that was submitted to the parliament of Sri Lanka Sabaragamuwa University of Sri Lanka (refer annex 14)

Figure 12: Location of the project area with the sample points

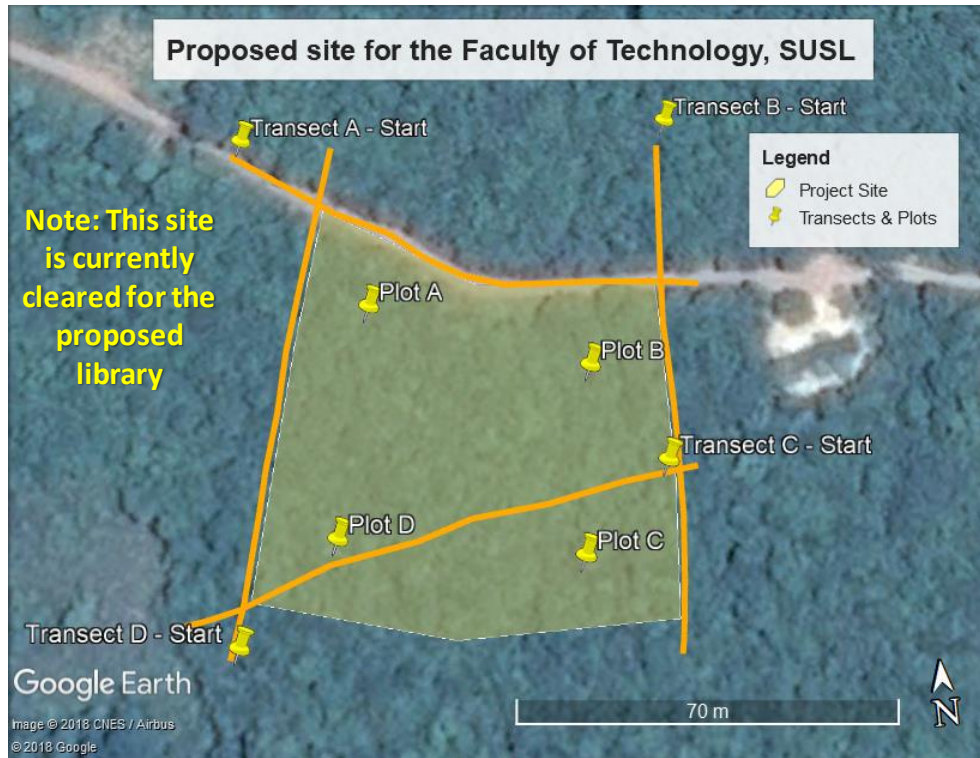


Table 8: Sampling locations of the terrestrial flora & fauna

Sample site	GPS coordinates (at start)	Habitat	Taxa sampled
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

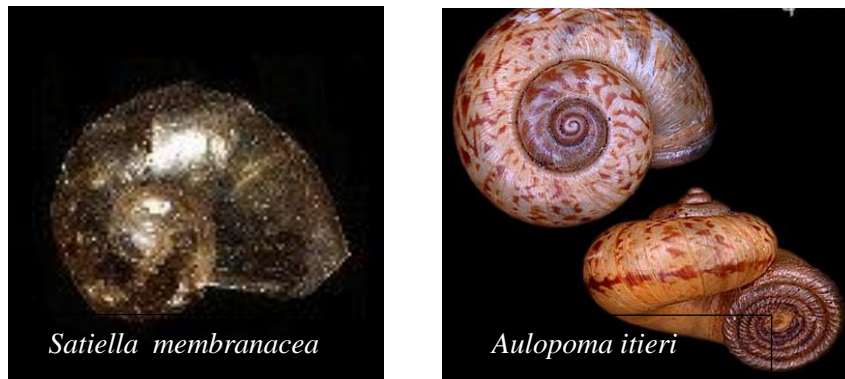
151. **Fauna:** The study reported 144 species including 98 vertebrate species representing 50 families and 46 species. 17 endemic species were recorded, while none of them are restricted-range species within the study area.
152. Further 12 species among them are listed as nationally threatened species (MoE, 2012). Taxon specific information on the species numbers for each group is summarized in the Table 10, while critical species inhabiting the project site within each taxonomic group is discussed later. Table 11 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.

Table 9: Summary of species composition of tetrapod vertebrates and selected invertebrate groups within the proposed site for the development

Taxonomic Group	No. of species	No. & (%) endemic species	No. & (%) threatened species
Land snails	10	5 (50%)	5 (50%)
Odonates	7	0	0
Butterflies	29	2 (6.9%)	2 (6.9%)
Amphibians	5	2 (40%)	0
Reptiles	16	2 (12.5%)	1 (6.3%)
Birds	68	5 (7.4%)	1 (1.5%)
Mammals	9	1 (11.1%)	3 (33.3%)
TOTAL	144	17 (11.8%)	12 (8.3%)

153. Among the land snails recorded during the study, the Sri Lankan endemic and critically endangered Sri Lanka Lucid Satiella Snail (*Satiella membranacea*) is of high conservation significance (see Figure 11). Further, two endangered species i.e. Itier's Operculate Snail (*Aulopoma itieri*) and Sphaeroid's Operculate Snail (*Aulopoma sphaeroidium*) and two other species that fall within the vulnerable category were also recorded

Figure 13: Sample plates of threatened species



Source: <http://www.bagniliggia.it/WMSD/HtmSpecies/5770000569.htm>

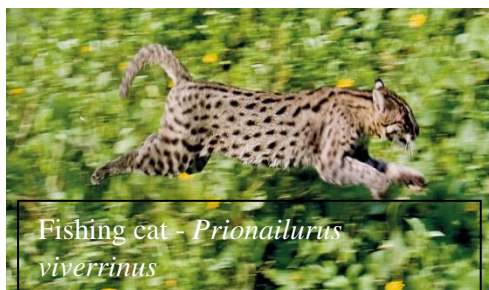
154. Among the two endemic species the Common Birdwing (*Troides darsius*) shows a widespread distribution and hence listed as a Least Concern species in the red list, while the Sri Lankan Hedge Hopper (*Baracus vittatus*) is categorized as vulnerable. Further two near threatened species have also been recorded from the study site i.e. Double banded Crow (*Euploea sylvester*) and the Dark Evening Brown (*Melanitis phedima*).
155. Common shrub frog (*Pseudophilautus popularis*) is listed as Near Threatened was recorded at the site. Two reptile species of conservation concern, the vulnerable endemic Zara's hump-nosed viper (*Hypnale zara*) (Figure 15) and the near threatened green keelback (*Macropisthodon plumbicolor*) (Figure 15) listed here were recorded from outside the project site. 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.

Figure 14: Threatened species



156. All the species of mammals with conservation concern listed here - Fishing cat - *Prionailurus viverrinus* (Figure 14), Barking deer - *Muntiacus muntjak* (Figure 14), Stripe-necked mongoose - *Prionailurus viverrinus*(Figure 14), and the Indian pipistrelle - *Pipistrellus coromandra* (Figure 14) were recorded from the areas outside the project site, hence will not be affected by the development as they are of higher dispersal ability.

Figure 15: species of mammals



157. 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. Table 10 provides species diversity for selected taxonomic group of vertebrates and invertebrates,

Table 10: Species diversity selected taxonomic groups of vertebrates and invertebrates within the proposed site

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

158. **Flora:** The main habitats observed within the proposed project site is a low canopy sparse vegetation dominated with “Spicate Eugenia” (*Syzygium zeylanicum*) (Table 11) and with some other shrubs, herbs, orchids and ferns. Further, few trees species found with 10 cm dbh or more.
159. 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 -1.36 for the total survey area. This value indicates significantly low plant species diversity in the proposed site.
160. 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 2012¹⁶.

¹⁶ RBA of the SUSL

Table 11: 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)	% Abundanc	EVOLUTIONAR Y STATUS	CONSERVATIO N STATUS	RECORDED FROM		
								Projec t Site	Peripher y	Outsid e
Rutaceae	<i>Acronychia pedunculata</i>	Ankenda	16.7	7.0	8.89	Native	LC	√		√
Lauraceae	<i>Cinnamomum citriodorum</i>	Pangiri Kurundu	21.5	6.3	22.2	Endemic	VU	√	√	√
Apocynacea	<i>Pagiantha dichotoma</i>	Divi Kaduru	14.8	7.0	6.67	Native	LC	√		√
Symplocaceae	<i>Symplocos cochinchinensis</i>	Bombu	13.0	6.5	4.44	Native	LC	√		
Myrtaceae	<i>Syzygium zeylanicum</i>	Yakada Maran	16.0	4.8	55.5	Native	LC	√	√	√
Myrtaceae	<i>Syzygium sp.</i>		10.0	3.5	2.20			√		√

161. **Conclusion:** Based on the findings of this study, proposed site for the development of the FT of the SUSL has revealed moderate levels of species richness in selected 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 FT, SUSL currently harbors a natural forest patch with moderate significance on ecological value in terms of floral and faunal diversity. Therefore, 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. However, wherever possible habitat enrichment should be carried out to support the birds, butterflies and snails showing moderate to high biodiversity in the area.

- **Educational, Medical and Religious Properties**

162. Within Imbulpe DSD there were 45 schools, 44 Buddhist dharma schools, 3 Christian dharma schools, and 4 vocational training centers and one vidatha center.

163. Balangoda base hospital is the main hospital in the area. Other than that Belihuloya rural hospital, Marathanna estate rural hospital and Pinnawala central dispensary is ear by area. There are 29 doctors, 117 nurses, within the DS. There was one Ayurveda central dispensary within DS.

164. 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.

- **Demographic details of affected population**

165. 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 ethnicity 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.

166. **Agriculture and Livestock practices:** Within Imbulpe DSD, cultivation of vegetables plays a more important role than paddy cultivation. Other than paddy, crops such as tea, cinnamon, pepper, coconut, rubber, vegetables are cultivated. Livestock also plays an important part in economic activities. 120 families were engaged in cattle farming.
167. **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 into a small scale to medium scale and large industries. Within the DSD, there were nearly 3000 people engaged in the industrial sector.
- **Analysis of alternatives**
168. 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 ESMP. Also, there is no existing facility in the vicinity that can be developed as an alternative to the proposed project. Therefore, examination of alternatives to the project's location, design, technology, and components show that it is compliant.
169. By looking at Table 13 below 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 in holistic development of the economy and improve the region and the country.
170. The FT Project of SUSL forms an important training center for the technology students. The proposed improvement project infrastructure would help to train graduates in technology stream under modern conditions and standards. The proposed building for the FT will ensure that highly skilled technology trained graduates with a competitive edge in the job market are produced. Keeping this in view, the site conditions and the

scope of development of the area, the ‘With’ and ‘without’ project scenarios have been compared as shown in Table 12.

Table 12: 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 land slides and species extinction	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	Nil	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 also be eliminated	Short term increase in dust due to earth work	Nil	Further deterioration of the project access road

Increased access to job markets	Nil	Nil	Reduced employment/ economic opportunities
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	There is no additional employment
Better access to other social services such as communication centers, and food cafes	More social networking facilities will create social unrest.	Nil	Arrest of possible significant enhancement and economic development of the region
Strengthening of local economies and local industries	Nil	Nil	In absence of the project, it will be difficult for the Sri Lankan government to finance such a technology education development facility for SUSL from its own resources.

5. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

5.1 Introduction

171. 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.

5.2 Land and Environment

a) Topography and Geology

172. **Construction Phase:** The impacts on existing topographical setting originate primarily from opening up borrow pits to fulfill the requirement of huge quantity of earth material to raise the DPC level of the proposed building to **XXX m MSL** considering the sloppy terrain of 10- 25⁰ of the land is lower in the southern boundary at the project site. Aggregate and sand will be procured from the authorized suppliers and prevalent rules will be followed for borrowing of soil. Hence the impact on geology of the region is not considered significant. About **XXX** m³ of borrow materials (Total compacted quantity of gravel) is to be used if the site is to be filled. The details of proposed borrow areas investigated with their respective locations would have to be given by the PIU and the site engineer concerned.

173. **Impacts:**

- i. Alteration of current land use & change in existing profile of the land due to proposed project location.
- ii. Changes of topography due to indiscriminate digging of borrow pits.
- iii. Un-managed digging of borrow pits resulting in water accumulation & breeding of vectors.

174. **Mitigation Measures:** 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 ESMP”. 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
175. **Operational Phase:** 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.
176. **Impact:**
- i. Likely change of land use due to squatter / encroachment within project land area and the surroundings.
 - ii. Likely change of land use due to site preparation including earth filling of the site and building in the project area.
 - iii. Likely change due to construction of the earth drains on the northern and the southern part of the boundary of the project site.
177. **Mitigation Measures:**
- i. 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.
 - ii. Squatter development along the project shall be strictly avoided by proper regulation and vigilance.
 - iii. Land use control measures will be prepared & administered to avoid occurrence of induced development as far as possible.
 - iv. Establishment of boundaries with walls, fences etc, at the commencement of construction.
- **Water and Environment**
178. **Drainage and Hydrological Flow:** 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.

179. Irregular maintenance of the water purification plant built during the Samanawewa project has led to water scarcity and inability to supply consistent safe drinking water to the university community¹⁷. In the recent past there has been several incidences of water scarcity reported from the university that compelled university authorities to close the university¹⁸.

180. **Impacts:**

- i. 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.
- ii. 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.
- iii. Increased incidence of soil erosion and stagnate water pools due to obstruction of natural drainage courses by the FT building construction embankments.
- iv. Increase of mosquitoes and other vectors increasing health risk.

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

- i. As the existing drain will be suitably augmented and properly reinforced & additional drainage structures will be constructed, it will not obstruct the natural water flow in the project site.
- ii. Adequate building and roadside drains will be provided along property to facilitate its better maintenance.
- iii. 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.

¹⁷ Auditor General's report 2016 to the parliament on university of Sabaragamuwa

¹⁸ Auditor general report and news first 2014

- iv. Construction works of culverts will be taken up during the lean flow periods to minimize the impacts on drainage.
- v. 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.
- vi. Propose a storm water drainage system around the FT complex to capture monsoonal drain waters during heavy rain and reduce runoff.
- vii. Temporary earth drains should be provided until required line or earth drains are provided after excavation or during other construction activities.
- viii. 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.

- **Water Use**

182. During the construction period water is required for compaction of embankment, dust suppression, concrete mixing and domestic use in the construction camp. The estimated tentative water requirement during construction stage will be calculated by the site engineers before the commencement of the project. See Table 13

Table 13: Breakup of fresh water requirement during construction

SN	Purpose	Quantity (KL)
1	a) Project road construction b) 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 & other use	
5	Labour camps/Temporary Accommodation Toilets, catering, washing (personnel)	

6	General Site Activities Tool washing Rinsing	
7	Wet Trades <ul style="list-style-type: none"> • Brick/blockwork • Screening • Concreting • Plastering • Core Boring • Lightweight Roofing • Ceramic Tile • Bentonite Mixing • Rendering 	
8	Groundworks <ul style="list-style-type: none"> • Grouting • Drilling/Piling 	
9	Cleaning <ul style="list-style-type: none"> • Cleaning Tools and Small Equipment • Plant and Equipment • Paintbrush Washing 	

183. **Operation Phase:** Water will be a limiting resource unless a proper water supply system is established. Ground water should not be used without testing for construction. Prior approval should be sought from WRB since currently water scarcity is prevalent on sites that are newly developed¹⁹. Water would have to be supplied from outside for the construction purposes in bowers. The current university supply in not sufficient.

184. **Mitigation:**

- i. Obtain the water supply connection to the site from the NWSB and calculate the requirements of water when the FT is in operation and during construction activities in order to avoid likely impacts on other users. Above measure would avoid pressure drops experienced in the water supply line
- ii. Consult and get a letter of commitment from NWSB on the World bank funded WASSIP project to see whether the water requirement of additional 600 students could be full filled. The project will on be commissioned in 2019.

- iii. The contractor will arrange water required for construction in such a way that the water supply to nearby communities remains unaffected.
 - iv. If tube-wells are to be bored, to supply the water required for construction, a prior approval of the WRB has to be obtained by the Contractor. Without permission from WRB, contractor will not be allowed to extract ground water.
 - v. Wastage of water during the construction should be minimized.
185. **Water Quality Monitoring:** 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 plans are available monitoring points and the intervals will be decided by the Environmental Officer.
186. **Silt Fencing:** Silt fencing should be provided to prevent sediments from the construction site entering into the nearby water channels. The silt fencing consists of geo textile with extremely small size supported by a wire mesh mounted on a panel made up of angle / wooden frame and post. The frame will should be installed at the edge of the agrarian canal along when construction is in progress. It is proposed to install silt trap at the edge of all water bodies located along the project site location
187. **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 will be reviewed by the Sr. Environmental Specialist of the Independent Engineer and finalized in consultation with PIU. 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
188. **Functional Sanitary facilities:** The ground water at the site may be unsuitable for consumption and therefore would have to depend on securing the water connection. The water connection needs to be secured through NWSDB for use during construction and

operation. It is important that functional sanitary facilities are maintained with sufficient water in the university to avoid health risks and spread of disease.

189. Regular sanitary facility checks and maintenance to be carried out by university. Already the design lay out of the building proposes a maintenance space. Maintenance staff should be employed for running of these sanitary facilities
190. Water storage facilities such as provision of a water storage tanks should be in place so that there will not be any shortage experienced during project implementation

- **Air Environment**

191. **Construction Phase:** 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.
192. The maximum desirable limits as per the National Ambient Air Quality Standards are given in Part 1 Annex-13 and the monitored values should correspond with the table.
193. 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 FTP and the access road only.
194. **Air quality monitoring** Apart from provision of the mitigation measures, air quality shall be monitored. The monitoring plan shall be functional during the construction period.

- **Noise Environment**

195. **Construction Phase:** 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.

196. Noise generated from sources mentioned above will be intermittent and mostly during daytime. The workers are likely to be exposed to high noise levels that may affect them. Student community is not expected to be disturbed as construction site is away from the already functional area of the University.
197. **Impact:** Increase in noise level due to construction activities like operation of construction equipment. Between 80-95 dB (A). The magnitude of impact from noise will depend upon types of equipment to be used, construction methods and also on work scheduling. Typical noise level of various activities associated with the project is presented below Table 14.

Table 14: 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

198. General conclusion can be based on the types of construction work anticipated, the likely equipment required and their associated range of noise levels. Typical noise level of principal construction equipment is presented below.

Table 15: 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

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

199. **Mitigation:**

- i. 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).
- ii. 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. The maximum permissible noise levels at boundaries of the land in which the sources of noise is located for construction activities are 75dB (A) L eq and 50 dB (A) Leq during day time and night time respectively (Day time: 6.00 am - 7.00pm, night time: from 7.00 pm - 6.00 am). However Contractor should limit working time for activities that create noise from 6.00 am to 6.00 pm.(Note: LAeq'T' means the equivalent continuous, A- weighted sound pressure determined over a time interval T (in dB).

- **Impact on the Fauna and Flora**

200. **Construction Phase:** The species richness presently in the project area and the surroundings is considered moderately significant. The forest system on the southern boundary which supports ecosystem services such as supporting, regulatory, provisioning and cultural. The cultural value, and medicinal plant value were not properly captured in the RBA.
201. Activities such as site clearing, construction of culvert, mining of boulders, removal of trees and green cover vegetation and etc., will not have a significant impact on the ecological resources of the area by means of disturbing habitat. However, increasing soil erosion and surface runoff, creating noise and vibration at the project site etc are some of the impacts encountered.
- Several endemic species have been established in the project site and the associated ecosystem. Construction machinery would bring in invasive species in to the area. Overall impacts will be insignificant on the fauna and flora as it is already a disturb habitat.
 - Barking deer, Stripe-necked mongoose, and the Indian pipistrelle that were observed feeding at the project site will be disturbed with the construction work. Construction activities would increase the level of fumes and the noise at the site.
202. **Mitigation:** Adoption of certain practices of mitigation will ensure that the project land and its surrounding habitat will be enriched without further degradation.
- Outright removal should not be done for the invasive species, as they are providing necessary ecosystem functions. Thus selective replacement of such exotic and alien invasive species with native species should be done.
 - Saplings for tree planting program should comprise of native or endemic species which is suitable to the existing climatic condition of the project areas.
 - Actions should be taken for speedy cleaning up of oil spills, fuel and toxic chemicals in the event of accidents.

- iv. All the construction workers and staff of the project unit should be made aware and educated about the presence of the flora and fauna in the area. Environmental awareness program should be provided to the Contractor, labours and all staff deployed at the site.
- v. All staff / workers should be instructed not to disturb or harm any fauna seen near the project area.
- vi. 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.
- vii. Construction debris should not be disposed in the forested areas.

- **Cumulative impacts**

203. According to the ADB Environment Safeguards Sourcebook cumulative impact is described as: “The combination of multiple impacts from existing projects, the proposed project and anticipated future projects that may result in significant adverse and / or beneficial impacts that cannot be expected in the case of a stand-alone project.” The sourcebook also describes induced impacts as: “Adverse and / or beneficial impacts on areas and communities from unintended but predictable developments caused by a project, which may occur at later or at a different location.
204. Economic activities supporting FT like lodging, and restaurants are expected to increase with new student population and induce development in the project area. The project area has good infrastructure for training of highly skilled graduates in engineering technology and bio technology fields.
205. The construction of the FT will provide better multidisciplinary graduates to meet the future demands of the engineering industry. These graduates will demonstrate ability to function effectively as an individual in multicultural teams, with the capacity to be a leader as well as an effective team member. Construction of FT will lead to (i) Reduction in travel time to access resourced laboratories that are located in different places in the district (ii) Apply modern techniques, resources, and IT tools to complex engineering activities (iii) Design systems, components or processes that meet specified needs of the engineering industry (iv) Access to new teaching and

learning methods competitive edge to secure quality job that ensures personnel security. (vi) increased opportunities to collaborate with local and overseas companies.

206. In terms of environment safeguard issues, the project 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. Currently the Local Authority of Imbulpe experience difficulties in regulated disposal of solid waste. Improvement in local economic conditions can also result in unorganized and illegal establishment of settlements and businesses along the access roads creating new problems of social issues. To address these potential problems, relevant local authorities and the university will have to monitor developments and strictly enforce rules.

- **Climate Change Impact and Risk**

207. Changes in the atmosphere have been detected that could drastically alter the climate system and the balance of ecosystems. Rising CO₂ 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.

208. **Rain induced soil erosion:** The land is composed of 0-25⁰slope and observation of project associated land show that there is a higher tendency for soil erosion. Adoption of a shallow type of foundation will ensure the stability of the building²⁰(refer full soil report(partial data from soil report is in Annex 2)

209. **Lighting and wind:** Climatic condition of high wind and precipitation lightning 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.

210. **Mitigation:** Several mitigation measures can be adopted and these include adoption of soil erosion control measures. This would include:

- i. Ensure the adoption of key engineering measures taken to address soil erosion in the design of the building. Required inputs should be sought from architects and engineers regarding prevention of soil erosion on the southern boundary

²⁰ Geotechnical report USJP

of the land. The architectural design should be geared to accommodate extreme rain and wind condition related disaster.

- ii. Adopt measures suggested by CEA, Imbulpe Pradeshiya Saba and UDA on construction near the forest ecosystem. Obtain their approval and clearances prior to construction.
- iii. Make sure that the drains are cleaned regularly - obtain the assistance of the Imbulpe Pradeshiya Saba for this purpose. Faculty has to carry out regular maintenance of culverts and drains adjoining the site to make sure that there are no local flooding conditions.
- iv. Ensure that the building and the equipment is properly insured for claims of natural disaster and lightning receptors installed. The building design be designed and material used should withstand lightning and wind speed.

- **Design of FT buildings under the green building**

211. FOT 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

212. **Impact:** Flaws in the FT design may lead several negative impacts that may influence the students' wellbeing and function of the university complex. 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. 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. Therefore these aspects will be required to be thought of at the design stage of the project 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.

213.

Mitigation:

- i. Overall building design should incorporate design features that improve the energy efficiency and water saving devices. In whole the green building designs principles should be applied wherever possible.
- ii. Ensure maximization of natural lighting and thermal circulation in the building. Employ passive design strategies, including building shape and orientation, passive solar design, and the use of natural lighting, to dramatically impact building energy performance.
- iii. 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.
- iv. 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 plans there is no garbage collection area that is being demarcated.
- v. To avoid overcrowding of the sanitary facilities (a ratio of 1:25 within the FT should be maintained). 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.

- **Risk of Fire and Emergency Preparedness**

214. **Operational Phase:** Once the FOT building is in operation, there could be incidents of student unrest or technical errors in the laboratories that may trigger off fire.

215. **Impact:** This may cause damage to property and risk lives

216. **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 in the building and placing emergency alarm system in the building to warn the student population of any such situations. Emergency evacuation points should be identified and plan of evacuation developed. Check with the Department of fire regulation on the specification of building accessibility for a fire extinguishing truck. Identification of flaws in the emergency operation plan and develop a revised plan for implementation.

- **Occupational Health and Safety and General Public**

217. **Construction Phase:** Both within and outside of project affected areas could create accidental harm to general public and work force. Construction of culvert on the access road, excavation on site, removal of trees, working on building at heights processing and transportation of construction materials are the main causes associated with accidental risk.

218. **Impact:** Majority of skilled and unskilled workers should be selected from the project influence area to avoid generation of waste and sanitation problems from labour camps. **About XXXX** workers under the categories of supper skill, semi-skilled and unskilled will be engaged by the contractor. This may result in conflict situations among the workers and settlers near worker camps. Spreading of communal diseases is also possible due to migrant laborers.

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

- i. Contractor should organize awareness programs about personal safety for workers. This should provide briefing and training on safety precautions, their responsibilities towards safety, etc.
- ii. 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.
- iii. 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.
- iv. 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.
- v. The construction labour camp should be equipped with first aid facilities and a trained personnel onsite in case of an injury
- vi. Ample lighting around the construction site should be provided during the night.
- vii. 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.
- viii. 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.

- ix. Onsite emergency plan for minor accidents and mishaps will be prepared by the contactor with the consultation of the PIU.

- **Waste Disposal and Sanitation**

220. **Construction Phase: 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. A proper permanent disposal site for these spoil material should be identified early on so that it will not impact the environment.

221. **Mitigation**

- i. At the moment the waste is unsorted and students do not practice this. They need to introduce waste sorting in the campus.
- ii. Contactor and the engineers should consult the Imbulpe Pardeshya Sabha (IPS) at the onset of the project on waste collection and disposal. Solid waste management is significant problem with the demographic growth and development experienced in the IPS area. Coordinate with the PHI and develop a suitable mechanism for disposal. Come to an agreement with the IPS on solid waste disposal until the Pilsaru project is implemented.
- iii. 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.
- iv. Seek approval from the DS and IPS for storage and disposal of spoil material and other gravel.
- v. 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.

- vi. 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.
 - vii. 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.
 - viii. Practice cleanliness and good housekeeping practices on site. Provision of proper drainage facilities to minimize stagnation of water around worker based camps and keeping the drainage facilities clean at all times to prevent breeding of rats and other vectors such as flies. Garbage bins should be provided to all workers based camps, construction sites and should be dumped regularly in a hygienic manner under the inspection of **Public Health Inspector (PHI)** in the area. PHI. expressed concern on construction related waste disposal. Refer notes on the stakeholder meeting Annex 5.
 - ix. 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.
222. **Operational Phase:** Waste disposal and sanitation becomes an important consideration with the occupancy level of the FT buildings.
223. **Impact:** 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.

224. **Mitigation:**

- i. 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.
- ii. 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. Obtain financial support and guidance from CEA for the composting project.
- iii. Train the students on importance of social responsibility and garbage disposal. Provide colour coded bins at several locations to encourage source separation.
- iv. Establish a waste management plan for the institute. 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.
- v. 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 etc. procured for FT.
- vi. Illegal garbage dumping & firing including asbestos dust will be a health issue to neighboring houses and it will be a health issue to students in the new faculty building. It is suggested that asbestos is not used in the building as it will be banned in 2024²¹. Use alternative roofing agents for the building during design.

- **Domestic liquid waste disposal**

225. **Impact:** Unregulated disposal of domestic waste water will impact the ground water table and surrounding waterways.

Mitigation

²¹ Daily Mirror 20th December 2017. Ban on asbestos relaxed

- i. Properly designed waste water treatment plant is in place
- ii. 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.
- iii. In instance of overflow, leaks, immediate repairs should be carried. Establish and collaborate with the Local Authority under such circumstances.

- **Health and Safety of students**

226. There are no anticipated significant impacts during the operation and maintenance of the project. 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.

227. **Mitigation:**

- i. First aid should be available on site in each of the labs.
- ii. Fire extinguishers and alarm system to be provided. Fire escapes should also be provided for each building.
- iii. Emergency switches should be properly covered and placed in each laboratory.

- **Adopt food safety guidelines**

228. **Impact:** Unless food and safety guideline are carefully adopted in the **canteens**, 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. Canteen staff should maintain personnel hygiene as they will be the initial point of contact of food.

229. **Mitigation:** Adopt food safety regulation imposed by the Ministry of Health. (Refer the Annex 11 for food regulations details).

- i. Train the canteen operators and improve awareness on food and safety and the national guidelines. These include adoption of food safety handling measure.
- ii. Ensure that the waiters and food service personnel practice regular hand washing during working hours especially when entering food handling area.

- iii. Ensure that food service personnel maintain personal hygiene and inform the canteen operator in case there are sick or has an injury.

6. PUBLIC CONSULTATION

6.1 Approach to Public Consultation

230. 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.

231. **Arrangement:** 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 5 provides the participant list). 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.

a. Methodology

232. 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 15.

233. 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. (Annex 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. The issues broadly covered in questionnaire included the following topics listed in 6.3.
234. **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 05. Registration was kept voluntary. Almost all of the participants registered themselves.

b. Analysis of the collected feedback

235. A total of 23 stakeholders participated in public consultation meeting. Information was gather on following topics
- i. Perception of building stability and the lay out plan
 - ii. Perception on noise vibration and dust
 - iii. Perception on grown water quality in the area adjacent to the site
 - iv. Perception on the water drainage and soil erosion
 - v. Perception on ecology and biodiversity issue
 - vi. Perception of the connectivity to the project site through the road network
 - vii. Perception of community befits as result for the FT complex
 - viii. Perception of the education offered at the faculty
 - ix. Perception of the solid waste management by the IPS
 - x. Perception of the waste waster management at the new FT premises
 - xi. Perception of the community settlement and access road usage for adjoin settlement at the project site
 - xii. Approval of green building certificate
236. **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 05.
- i. Design and implement a drainage plan for the project and improve soil conservation measures. Importance of liaizing with NBRO

- ii. Reservation limits to be maintained minimize the impact of the project on the Samanala wewa.
- iii. Managing noise, dust and vibration at the site.
- iv. Importance of obtaining clearance from the Imbulpe Pradeshiya Saba (IPS), CEA, and UDA for the project.
- v. 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.
- vi. Establishment of a waste water treatment plant.
- vii. Importance of students maintaining communal harmony with the local villagers

Figure 16: Plates of Stake Holder Meeting



7. INSTITUTIONAL IMPLEMENTING ARRANGEMENT

To be discussed and finalized between ADB and MOHEH.

8. CONCLUSION AND RECOMMENDATIONS

8.1 Conclusion:

270. 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 ESMP provide appropriate guidance for suitable environmental and social safeguards. Accordingly, the proposed project can be recommended for implementation with strict adherence to ESMP and GRM provided in this IEE.
271. Most of the adverse impacts of FT during construction period are short term and temporary in nature. Environment friendly construction methodology has been incorporated into the project design and the ESMP has been prepared to minimize the overall impacts on the environment during the proposed project civil works. Since the proposed project is likely to experience soil erosion and possible earthslips, it is recommended that careful observations be made during the current rainy season on further design improvements and incorporated proper drainage.
272. As per the Government of Sri Lanka regulation, Environmental Clearance is 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 obtain for the establishment of FT.
273. Geotechnical report recommends that **XXX** foundation be adopted in the detail designing of the project. However the geotechnical report does not analyse with respect to the proposed master plan which details out the respective space allocations of the buildings and the expected load bearing of each building. Therefore, the load bearing capacity should be compared with recommended values given by ICTAD once the design plans are developed. The geo technological report does not provide any alternative for a soft foundation nor provide any conclusive recommendations to draw up any conclusion. NBRO geotechnical report recommends that stability of ground with

the building cannot be assessed due to unavailability of design details of the proposed building.

2.2 **Recommendation:**

274. The ESMP has been prepared incorporating various modern technologies and guidelines to reduce the environmental impacts of project constructions to make it a Green building. Therefore, it is recommended to follow the ESMP and associated Guidelines during construction and operation phases of the project.

2.3 **Measures to be adopted to improve the habitat around the project site**

275. **Solid Waste Management on site:** At FT, currently there is no solid waste management plan. FT should take measures at the inception of the construction to implement the Pilisaru program of CEA (already awarded) and implement the solid waste management without the unregulated disposal into the forest areas. As a technology faculty that is trying out modern technology they should develop a mechanism that is suitable for solid waste disposal that has no carbon footprinting and zero emissions.

276. Solid waste disposal generated during the construction and operational phase will obscure the environment and lead to pollution problems. The best way of disposal of waste is to develop a waste management plan for the project as included in the ESMP. Degradable solid waste can be composted while spoil material and other debris should be disposed at approved identified dump site.

277. Until this is established it is recommended that SUSL seek an agreement with the IPS to receive solid waste and dispose of it.

278. **Waste water management and disposal:** Waste water should be treated in a treatment facility that can handle the occupancy capacity of the designed buildings and there should be adequate funding allocated for the operation of the facility throughout FT operation. A Bio Up-flow Anaerobic Floating Filter Technology could be adopted for the building and this would be a low cost waste water management technology.

279. Until a waste water treatment plant is established a mechanism should be in place for removal of sewage using gully covers to avoid soil contamination. For this liaise with the secretary of Imbulpe radeshiya Saba. At the moment it is openly disposed to a tank that carries the leachate down stream contaminating the ground water and the surface

- water (information provided by local PHI). This is a health risk to the student population and the SUSL has been warned and request to mitigate the problem by the local MOH.
280. **Monsoonal rains:** It is recommended that water drainage plan is 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. Consult the NBRO and obtain their clearance prior to commencement of construction activities
- i. Improving the surface drainage system within the project area
 - ii. Maintenance of the sewerage system during rainy season
 - iii. Plant grass and shrubs in 20 -30⁰ terrain. Use mulch matting to hold vegetation on slope
 - iv. Add mulch or rocks to soil
 - v. Build retaining walls
 - vi. Avoid soil compaction
281. NBRO recommends improvement of surface drainage conditions at the site prior to the commencement of the construction and also proper drainage measures should be provided after construction to allow the flow of storm water with the minimum disturbance to the subsurface. In this regards care must be taken to identify the existing natural flow path and drainage patterns. In case of placing build on cut and fill ground, adequate buffer zone should be allowed from the edge of the slope while establishing the foot prints of the proposed construction other wise appropriate lateral support in the form of a retained structure with proper drainage might be required to ensure the stability.
282. Since the drainage systems play an important role in the hydrology of the project associated area, SUSL should follow up with them and develop a schedule to clean and ensure maintenance. Funds within the FT should be allocated for such management activities.
283. Project associated network of waterways need to be regularly cleaned and maintained For this purpose SUSL will be required to also consult the RDA and the Imbulpe Pradeshiya Saba to clean and maintain the roadside drains.

284. The project site should be filled at least up to 0.5 m MSL by keeping minimum freeboard during site preparation. DPC level of the proposed buildings should be generally 0.50 m above the recommended fill level. Hence a detailed review of this should be carried out and engineering designs should adopt erosion management strategies.
285. **Clearances:** SUSL FT need to take measures to initiate the Green Building Certification process with the UDA (Annex 1). SUSL will be required to fill in the BIQ and obtain and EPL for the canteens if they are catering for over 50. Previous experience show that the university has not been able to satisfactory manage the health and hygiene issues of the canteen²².
286. **Stability of the foundation:** All building in the proposed FT should be on shallow type of a foundation that will stand the forces of soil erosion and wind factor. Since the geo technical information currently available, does not clearly provide information on the recommended structural intervention, it is recommended that the ultimate skin friction coefficient (f_u) be revisited once the design plans are in place and ensure that they are in line with the ICTAD guidelines (ICTAD/DEV/15)²³.
287. **Provision of water supply:** The ground water quality of the project site needs to be investigated. This was not captured in the geo technical report and no previous studies on the ground water was available to comment on the groundwater quality of the site at the time of this IEE preparation.
288. It should be ensured that the construction workers are provided with drinking water from the onset of the construction phase. It is also recommended that prior to construction, water quality of the dug well or tube well (if being used) at the site is tested for its suitability for consumption.
289. **Water supply from NWSDB:** Water shortage is experienced in the dry months of the year since the demand for water supply is an ever increasing problem with the rapid urbanization in the IPS limits. Therefore a special water supply line should be established prior to construction in order to prevent any water pressure drop in the supply line. It may impact other stakeholders who consume water around the project

²² MOH office Imbulpe

²³ Geotechnical investigation for proposed building for faculty of computing and technology, university of Kelaniya . April 2018

- location. Consult and liaise with the NWSB since water is a limiting resource at the project site.
290. A commitment from the WASSIP project should be secured and followed up on delivery date. Under this project water will be supplied to the university but at the moment water will be a scarce resource especially during the dry months of the year. Therefore contractor will be required to seek alternative water extraction methods.
291. **Disaster management plan:** During all stages of the project cycle, landslides, tornado associated disaster action plan should be developed to minimize the economic cost of the project and risks on life and property. More detail account is given in the ESMP.
292. **Habitat enrichment:** A rapid biodiversity assessment on site does not properly assess the floral diversity. However the overall species diversity indicates that there is a moderately significant species richness of animal population within the forest patch.
293. Several measures should be adopted to improve the habitat around the project site. Planting of recommended species along the reservation of the southern boundaries of the land with adequate provision to clean the canal and drains is important. Develop a recommended species list for the university. This was not available in the RBA. There was not assessment done on the communal benefits from the forest ecosystem. The southern boarder of the project site is recommended to be conserved in the RAB because of its species richness. Consider the detailed architectural designs and develop a green belt with trees and shrubs on the southern borders of the land to minimize the impact of forest patch and to encourage especially the endemic species.
294. Develop a recommended species list that will be fruit bearing to attract the butterflies and birds in the area.
295. **Insulation of lighting receptors:** With possible rain and storm it is recommended that the building is secured with lighting receptors to protect the valuable equipment in the state of the art modern labs at FT.
296. Build in to the design mitigatory measures to withstand forces of wind. If there is enough wind energy, establish a wind power plant to harness renewable energy. (Idea already being explored by VC).
297. **Access road and others:** Consult the fire department and provide adequate space on road which served within the FT premises for accessibility of a fire extinguishing truck.

298. **Environmental monitoring:** Carry out the baseline monitoring of the environmental parameters in order to avoid or manage any environmental pollution associated with the project. The FT PIU will be required to facilitate environmental monitoring and conduct stakeholder meetings during the operational phase of FT. For the above purpose there should be proper funding mechanism in place at the FT.

INITIAL ENVIRONMENT EXAMINATION FOR SABARAGAMUWA
UNIVERSITY OF SRI LANKA, FACULTY OF TECHNOLOGY

PART II: ANNEXES

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ANNEX 01: GREEN BUILDING APPLICATION

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ANNEX 02: 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. FIELD INVESTIGATIONS

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 very dense silty SAND/ sandy SILT
(Completely Weathered Rock)
- Layer 3b - Highly weathered insitu boulder
- Layer 4 - Weak GARNET BIOTITE GNEISS

Table 7.1: Thickness of the different layers at the borehole locations and the observed SPT

BH 01				BH 02			
From	To	N ₆₀	Layer	From	To	N ₆₀	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	16.30	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	Nil	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'_{60} from the field SPT blow counts (N_{Field}):

$$N'_{60} = N_{Field} C_p \eta_1 \eta_2 \eta_3 \eta_4$$

Where

$$C_p = \sqrt{\frac{95.76}{p'_o}} \quad \eta_1 = \frac{E_r}{70}$$

- p'_o = Effective overburden pressure at the test level
- E_r = Efficiency of the hammer used (taken as 55%)
- η_1 = Modification factors (Bowles, 1996)

The estimated N'_{60} 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'_{60}	Drained		Undrained	Soil type	State	Corrected N'_{60}	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

GEOTECHNICAL ENGINEERING DIVISION



NATIONAL BUILDING RESEARCH ORGANIZATION

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

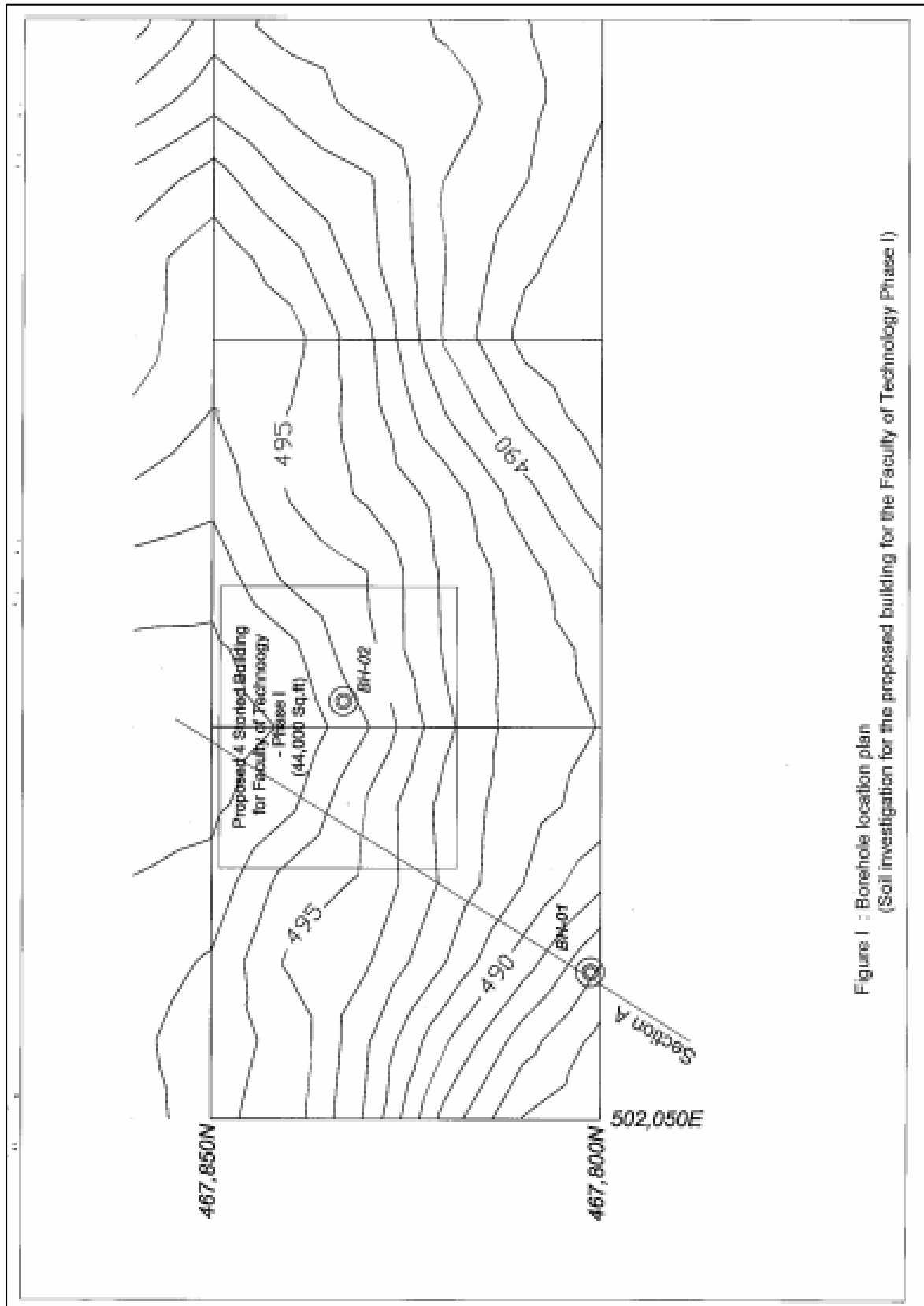


Figure 1 : Borehole location plan
(Soil investigation for the proposed building for the Faculty of Technology Phase I)

ANNEX 03: CHECK LIST

Rapid Environmental Assessment (REA) Checklist

Instructions:

- (i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Environment and Safeguards Division (RSES) for endorsement by Director, RSES and for approval by the Chief Compliance Officer.
- (ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.
- (iii) Answer the questions assuming the “without mitigation” case. The purpose is to identify potential impacts. Use the “remarks” section to discuss any anticipated mitigation measures.

Country/Project Title:

Sabaragamuwa University of Sri Lanka– New Technology Faculty Development Project

Sector Division:

Faculty of Applied Science

Screening Questions	Yes	No	Remarks
A. Project Siting Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
<input type="checkbox"/> Cultural heritage site		x	
<input type="checkbox"/> Protected Area		x	
<input type="checkbox"/> Wetland		x	
<input type="checkbox"/> Mangrove		x	
<input type="checkbox"/> Estuarine		x	
<input type="checkbox"/> Buffer zone of protected area		x	
<input type="checkbox"/> Special area for protecting biodiversity		x	
<input type="checkbox"/> Bay		x	
B. Potential Environmental Impacts Will the Project cause...			

<input type="checkbox"/> Ecological disturbances arising from the establishment of a plant or facility complex in or near sensitive habitats?	x		The university area is surrounded by scrub vegetation and perennial cultivation development. A biodiversity assessment needs to be carried out in order to assess the potential significance of maintaining it as a conservation habitat for the purpose of research and development of the Applied Science Faculty. This region is known for butterflies and dragonflies. Also, if more than 1 hectare of the forest will be cleared and put into no forest use, an IEE will be required under the national regulations.
<input type="checkbox"/> Eventual degradation of water bodies due to discharge of wastes and other effluents from plant or facility complex?		x	Of Course wastewater and effluent needs to be treated and managed before any disposal.

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Screening Questions	Yes	No	Remarks
<input type="checkbox"/> Serious contamination of soil and groundwater?	x		This is possible unless necessary actions are taken. To avoid contamination of ground and surface waters, designing of waste water treatment system for the building is necessary. During the construction phase, place proper sanitary facilities for the workers.
<input type="checkbox"/> Aggravation of solid waste problems in the area?	x		No proper solid waste collection mechanism currently. This needs to be discussed with the Local Authority.
<input type="checkbox"/> Public health risks from discharge of wastes and poor air quality; noise and foul odor from plant emissions?		x	
<input type="checkbox"/> Short-term construction impacts (e.g. soil erosion, deterioration of water and air quality, noise and vibration from construction equipment)?	x		Noise, vibration, air quality may occur due to construction activities and the welding machines in operation. In the absence of good housekeeping practices and appropriate occupational safety measures, it may pose a risk for the

			health and safety of the construction workers.
<input type="checkbox"/> Dislocation or involuntary resettlement of people?		x	
<input type="checkbox"/> disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		x	
<input type="checkbox"/> Environmental degradation (e.g. erosion, soil and water contamination, loss of soil fertility, disruption of wildlife habitat) from intensification of agricultural land use to supply raw materials for plant operation; and modification of natural species diversity as a result of the transformation to monoculture practices?		x	
<input type="checkbox"/> Water pollution from discharge of liquid effluents?	x		Sanitary facilities should be properly designed for the faculty in order to avoid such problems. During construction, contractor should provide proper sanitary facility to avoid contamination of the ground water table.
<input type="checkbox"/> Air pollution from all plant operations?		x	
<input type="checkbox"/> Gaseous and odor emissions to the atmosphere from processing operations?		x	
<input type="checkbox"/> Accidental release of potentially hazardous solvents, acidic and alkaline materials?	X		There is a possibility of accidental spills from chemicals etc used in labs during operation. There should be safety measures in place for such emergencies.
<input type="checkbox"/> Uncontrolled in-migration with opening of roads to forest area and overloading of social infrastructure?		x	
<input type="checkbox"/> Occupational health hazards due to fugitive dust, materials handling, noise, or other process operations?	x		During constructions vibrations and leveling and other operational process noise, dust and other health problems may occur. But it is not expected to have a high significance as the site is at one end of the campus.
<input type="checkbox"/> Disruption of transit patterns, creation of noise and congestion, and pedestrian hazards aggravated by heavy trucks?	x		This may be an issue as trucks will have to travel through the campus to the site.

<input type="checkbox"/> Disease transmission from inadequate waste disposal?	x		A proper waste management plan should be place within the premises. During our site observation disposal of sanitary waste has created a problem hence there is no proper mechanism at present. Unless it is properly designed it will lead to health and sanitation risks. Advice and guidance should be sought from CEA and the local authority.
<input type="checkbox"/> Risks and vulnerabilities related to occupational health and safety due to physical, chemical, and biological hazards during project construction and operation?	x		This is mainly expected during operation of labs. Safety protocols have to be developed and guidelines for emergencies identified.
<input type="checkbox"/> Large population increase during project construction and operation that cause increased burden on social infrastructure and services (such as water supply and sanitation systems)?	x		Probability is high since there is no water supply but it is brought over to the premises from another area. The current expansion should consider availability of water for the project and other option such as rainwater harvesting.
<input type="checkbox"/> Social conflicts if workers from other regions or countries are hired?		x	

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Screening Questions	Yes	No	Remarks
<input type="checkbox"/> Community health and safety risks due to the transport, storage, and use and/or disposal of materials likely to create physical, chemical and biological hazards during construction, operation and decommissioning?	x		Spoil material from a decommissioned building onsite will lead to community health risk unless properly disposed.

A Checklist for Preliminary Climate Risk Screening

Country/Project Title: Sri Lanka/ Sabaragamuwa New Technology Development Project

Sector :

Subsector:

Division/Department:

Screening Questions		Score	Remarks ¹
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather related events such as floods, droughts, storms, landslides?	1	Landslide possibility as it is a hilly area. Clearance should be obtained from NBRO.
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?	1	Should consider wind speed and slope.
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydrometeorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?	0	
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s) ?	0	
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?	0	

Options for answers and corresponding score are provided below:

Response	Score
----------	-------

¹ If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response, will be categorized as high risk project.

Result of Initial Screening (Low, Medium, High): Medium

Other

Comments: _____

Prepared by: Sithara Atapattu

INDIGENOUS PEOPLES IMPACT CATEGORIZATION

Date: 28/08/2017

A. Instructions			
<p>(i) The project team completes and submits the form to the Environment and Safeguards Division (RSES) for endorsement by RSES Director, and for approval by the Chief Compliance Officer (CCO).</p> <p>(ii) The classification of a project is a continuing process. If there is a change in the project components or/and site that may result in category change, the Sector Division submits a new form and requests for recategorization, and endorsement by RSES Director and by the CCO. The old form is attached for reference.</p> <p>(iii) The project team indicates if the project requires broad community support (BCS) of Indigenous Peoples communities. BCS is required when project activities involve (a) commercial development of the cultural resources and knowledge of indigenous peoples, (b) physical displacement from traditional or customary lands; and (c) commercial development of natural resources within customary lands under use that would impact the livelihoods or the cultural, ceremonial, or spiritual use that define the identity and community of indigenous peoples.</p> <p>(iv) In addition, the project team may propose in the comments section that the project is highly complex and sensitive (HCS), for approval by the CCO. HCS projects are a subset of category A projects that ADB deems to be highly risky or contentious or involve serious and multidimensional and generally interrelated potential social and/or environmental impacts.</p>			
B. Project Data			
Country/Project No./Project Title		: Sabaragamuwa University of Sri Lanka– New Technology Faculty Development Project	
Department/ Division		: Faculty of Applied Science	
Processing Stage		: Preliminary	
Modality		:	
<input type="checkbox"/> Project Loan	<input type="checkbox"/> Program Loan	<input type="checkbox"/> Financial Intermediary	<input type="checkbox"/> General Corporate Finance
<input type="checkbox"/> Sector Loan	<input type="checkbox"/> MFF	<input type="checkbox"/> Emergency Assistance	<input type="checkbox"/> Grant
<input type="checkbox"/> Other financing modalities:			
C. Indigenous Peoples Category			
<input type="checkbox"/> New <input type="checkbox"/> Recategorization — Previous Category <input type="checkbox"/>			
<input type="checkbox"/> Category A	<input type="checkbox"/> Category B	<input type="checkbox"/> Category C	<input type="checkbox"/> Category FI
D. Project requires the broad community support of affected Indigenous Peoples communities.		<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
E. Comments			
Project Team Comments:		SDES Comments:	
There are no indigenous people within or in the surrounding areas. This is a rural area with a forest patch.			
F. Approval			
Proposed by:		Reviewed by:	
Project Team Leader, {Department/Division}		Social Safeguard Specialist, SDES	
Date:		Date:	
		Endorsed by:	
A.K.S.S.S. Atapattu, Director/Safeguards, TMS Company (Pvt) Ltd		Director, SDES	
Date:		Date:	
Endorsed by:		Approved by:	
		<input type="checkbox"/> Highly Complex	

Director, {Division} D at e:	Chief Compliance Officer	and Sensitive Project
	Date:	

Indigenous Peoples Impact Screening Checklist

KEY CONCERNS (Please provide elaborations on the Remarks column)	YES	NO	NOT KNOWN	Remarks
A. Indigenous Peoples Identification				
1. Are there socio-cultural groups present in or use the project area who may be considered as "tribes" (hill tribes, schedules tribes, tribal peoples), "minorities" (ethnic or national minorities), or "indigenous communities" in the project area?		X		
2. Are there national or local laws or policies as well as anthropological researches/studies that consider these groups present in or using the project area as belonging to "ethnic minorities", scheduled tribes, tribal peoples, national minorities, or cultural communities?		X		
3. Do such groups self-identify as being part of a distinct social and cultural group?		X		
4. Do such groups maintain collective attachments to distinct habitats or ancestral territories and/or to the natural resources in these habitats and territories?		X		
5. Do such groups maintain cultural, economic, social, and political institutions distinct from the dominant society and culture?		X		
6. Do such groups speak a distinct language or dialect?		X		
7. Has such groups been historically, socially and economically marginalized, disempowered, excluded, and/or discriminated against?		X		
8. Are such groups represented as "Indigenous Peoples" or as "ethnic minorities" or "scheduled tribes" or "tribal populations" in any formal decision-making bodies at the national or local levels?		X		
B. Identification of Potential Impacts		X		
9. Will the project directly or indirectly benefit or target Indigenous Peoples?		X		

KEY CONCERNS (Please provide elaborations on the Remarks column)	YES	NO	NOT KNOWN	Remarks
10. Will the project directly or indirectly affect Indigenous Peoples' traditional socio-cultural and belief practices? (e.g. child-rearing, health, education, arts, and governance)		X		
11. Will the project affect the livelihood systems of Indigenous Peoples? (e.g., food production system, natural resource management, crafts and trade, employment status)		X		
12. Will the project be in an area (land or territory) occupied, owned, or used by Indigenous Peoples, and/or claimed as ancestral domain?		X		
C. Identification of Special Requirements <i>Will the project activities include:</i>				
13. Commercial development of the cultural resources and knowledge of Indigenous Peoples?		X		
14. Physical displacement from traditional or customary lands?		X		
15. Commercial development of natural resources (such as minerals, hydrocarbons, forests, water, hunting or fishing grounds) within customary lands under use that would impact the livelihoods or the cultural, ceremonial, spiritual uses that define the identity and community of Indigenous Peoples?		X		
16. Establishing legal recognition of rights to lands and territories that are traditionally owned or customarily used, occupied or claimed by indigenous peoples ?		X		
17. Acquisition of lands that are traditionally owned or customarily used, occupied or claimed by indigenous peoples?		X		

D. Anticipated project impacts on Indigenous Peoples

Project component/ activity/ output	Anticipated positive effect	Anticipated negative effect
1. LIST ALL PROJECT COMPONENT / ACTIVITY / OUTPUTS HERE	---- INDICATE EFFECTS TO IPS OR PUT N/A AS NECESSARY	

2.		
3.		
4.		
5.		

Note: The project team may attach additional information on the project, as necessary.

INVOLUNTARY RESETTLEMENT IMPACT CATEGORIZATION

Date: _____

A. Instructions (i) The project team completes and submits the form to the Environment and Safeguards Division (RSES) for endorsement by RSES Director, and for approval by the Chief Compliance Officer (CCO). (ii) The classification of a project is a continuing process. If there is a change in the project components or/and site that may result in category change, the Sector Division submits a new form and requests for recategorization, and endorsement by RSES Director and by the CCO. The old form is attached for reference. (iii) In addition, the project team may propose in the comments section that the project is highly complex and sensitive (HCS), for approval by the CCO. HCS projects are a subset of category A projects that ADB deems to be highly risky or contentious or involve serious and multidimensional and generally interrelated potential social and/or environmental impacts.			
B. Project Data Country/Project No./Project Title : Sabaragamuwa University of Sri Lanka– New Technology Faculty Development Project Department/ Division : Faculty of Applied Science Processing Stage : Preliminary Modality : _____ <input type="checkbox"/> Project Loan <input type="checkbox"/> Program Loan <input type="checkbox"/> Financial Intermediary <input type="checkbox"/> General Corporate Finance <input type="checkbox"/> Sector Loan <input type="checkbox"/> MFF <input type="checkbox"/> Emergency Assistance <input type="checkbox"/> Grant <input type="checkbox"/> Other financing modalities: _____			
C. Involuntary Resettlement Category <div style="text-align: center;"> <input checked="" type="checkbox"/> New <input type="checkbox"/> Recategorization — Previous Category [] </div> <hr style="border-top: 1px dashed black;"/> <div style="display: flex; justify-content: space-around; text-align: center;"> <div><input type="checkbox"/> Category A</div> <div><input type="checkbox"/> Category B</div> <div><input type="checkbox"/> Category C</div> <div><input type="checkbox"/> Category FI</div> </div>			
D. Comments Project Team Comments:		SDES Comments:	
E. Approval			
Proposed by: _____ Project Team Leader, {Department/Division} Date:		Reviewed by: _____ Social Safeguard Specialist, SDES Date:	
Endorsed by: _____ Social Development Specialist, {Department/Division} Date:		Endorsed by: _____ Director, SDES Date:	
Endorsed by: _____ Director, {Division} Date:		Approved by: _____ Chief Compliance Officer Date:	<input type="checkbox"/> Highly Complex and Sensitive Project

Involuntary Resettlement Impact Categorization Checklist

Probable Involuntary Resettlement Effects	Yes	No	Not Known	Remarks
Involuntary Acquisition of Land				
1. Will there be land acquisition?		X		
2. Is the site for land acquisition known?		X		
3. Is the ownership status and current usage of land to be acquired known?		X		
4. Will easement be utilized within an existing Right of Way (ROW)?		X		
5. Will there be loss of shelter and residential land due to land acquisition?		X		
6. Will there be loss of agricultural and other productive assets due to land acquisition?		X		
7. Will there be losses of crops, trees, and fixed assets due to land acquisition?		X		
8. Will there be loss of businesses or enterprises due to land acquisition?		X		
9. Will there be loss of income sources and means of livelihoods due to land acquisition?		X		
Involuntary restrictions on land use or on access to legally designated parks and protected areas				
10. Will people lose access to natural resources, communal facilities and services?		X		
11. If land use is changed, will it have an adverse impact on social and economic activities?		X		
12. Will access to land and resources owned communally or by the state be restricted?		X		
Information on Displaced Persons:				
Any estimate of the likely number of persons that will be displaced by the Project? If yes, approximately how many? _____				[] No [] Yes
Are any of them poor, female-heads of households, or vulnerable to poverty risks?				[] No [] Yes
Are any displaced persons from indigenous or ethnic minority groups?				[] No [] Yes

Note: The project team may attach additional information on the project, as necessary.

ENVIRONMENT CATEGORIZATION

Date: 28/08/2017

A. Instructions (i) The project team completes and submits the form to the Environment and Safeguards Division (RSES) for endorsement by RSES Director, and for approval by the Chief Compliance Officer (CCO). OM F1/OP on <i>Safeguard Review Procedures</i> (paras. 4-7) provides the requirements on environment categorization. (ii) The classification of a project is a continuing process. If there is a change in the project components or/and site that may result in category change, the Sector Division submits a new form and requests for recategorization, and endorsement by RSES Director and by the CCO. The old form is attached for reference. (iii) In addition, the project team may propose in the comments section that the project is highly complex and sensitive (HCS), for approval by the CCO. HCS projects are a subset of category A projects that ADB deems to be highly risky or contentious or involve serious and multidimensional and generally interrelated potential social and/or environmental impacts.					
B. Project Data Country/Project No./Project Title : University of Sabaragamuwa– New Engineering Faculty Development Project <hr/> Department/ Division : Department of Technology Processing Stage : Preliminary Modality : _____ <input checked="" type="checkbox"/> Project Loan <input type="checkbox"/> Program Loan <input type="checkbox"/> Financial Intermediary <input type="checkbox"/> General Corporate Finance <input type="checkbox"/> Sector Loan <input type="checkbox"/> MFF <input type="checkbox"/> Emergency Assistance <input type="checkbox"/> Grant <input type="checkbox"/> Other financing modalities: _____					
C. Environment Category (please tick one category based on the set of criteria in OMF1 (paras. 6-7)) <input checked="" type="checkbox"/> New <input type="checkbox"/> Recategorization — Previous Category [<input type="checkbox"/>]					
<input type="checkbox"/> Category A	<input checked="" type="checkbox"/> Category B				
<input type="checkbox"/> Category C	<input type="checkbox"/> Category FI				
D. Basis for Categorization/ Recategorization (please. attach supporting documents): <input checked="" type="checkbox"/> REA Checklist <input checked="" type="checkbox"/> Project and/or Site Description <input type="checkbox"/> Other: _____					
E. Comments <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px; vertical-align: top;"> Project Team Comments A fairly straight forward site however, the development require the clearing of montane forest within the university premises. Request for a biodiversity assessment as the region is known for its butterfly and dragonfly diversity. </td> <td style="width: 50%; padding: 5px; vertical-align: top;"> SDES Comments </td> </tr> </table>		Project Team Comments A fairly straight forward site however, the development require the clearing of montane forest within the university premises. Request for a biodiversity assessment as the region is known for its butterfly and dragonfly diversity.	SDES Comments		
Project Team Comments A fairly straight forward site however, the development require the clearing of montane forest within the university premises. Request for a biodiversity assessment as the region is known for its butterfly and dragonfly diversity.	SDES Comments				
F. Approval <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px; vertical-align: top;"> Proposed by: Sithara Atapattu, TMS environment Consultant Project Team Leader, {Department/Division} Date: _____ </td> <td style="width: 50%; padding: 5px; vertical-align: top;"> Endorsed by: _____ Director, SDES Date: _____ </td> </tr> <tr> <td style="padding: 5px; vertical-align: top;"> Endorsed by: _____ </td> <td style="padding: 5px; vertical-align: top;"> Approved by: _____ </td> </tr> </table>		Proposed by: Sithara Atapattu, TMS environment Consultant Project Team Leader, {Department/Division} Date: _____	Endorsed by: _____ Director, SDES Date: _____	Endorsed by: _____	Approved by: _____
Proposed by: Sithara Atapattu, TMS environment Consultant Project Team Leader, {Department/Division} Date: _____	Endorsed by: _____ Director, SDES Date: _____				
Endorsed by: _____	Approved by: _____				
<input type="checkbox"/> Highly Complex					

Director, {Division} D at e:	Chief Compliance Officer Date:	and Sensitive Project
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ANNEX 04: SITE REPORT

New Technology Faculty Development Project in Sabaragamuwa University of Sri Lanka
Brief Site Inspection Report

(23rd 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 premises in Rathnapura District, Sabaragamuwa Province. See Figure 1.

University of Sabaragamuwa commenced in 1991 as an affiliated collage to the University of Sri Jayawardenapura. 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 Samanawewa 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 consist 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.

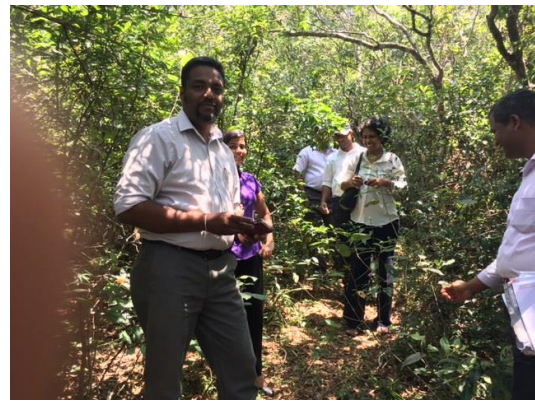


Figure 2: Proposed development land

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 develop 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 authorities 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 05:
SUMMARY OF STAKEHOLDER
CONSULTATION MEETING

**SUMMARY OF STAKEHOLDER CONSULTATION MEETING
HELD IN SABARAGAMUWA UNIVERSITY OF SRI LANKA**

Date: 1st May 2018 Time: 10.30 am - 11.30 a.m

Location: Sabaragamuwa University of Sri Lanka

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, Senior Lecturer, 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 Sabaragamuwa University of Sri Lanka

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 Pradehsysa 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 Sabaragamuwa University of Sri Lanka with historical context. Purpose of building the FT premises and the benefits 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, Sabaragamuwa University of Sri Lanka. 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 of Sri Lanka.
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 “Pilisarū”. 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.





Over view of the gathering with the village community adjoin the SUSL



Dr Attapatu, Ms Charmini, Yasundara at the stakeholder consultation

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 bowers and emptied into a open cement tank which is not covered and this is a public nuisance for the villagers adjoin the university premises. He add 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 waster 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 belhul 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 todote 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 tht the WASIp waster 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/ කනකුල/புதவி	Organization/ සමාගම/ நிறுவனம்	Contact No/ දුරකථන අංකය/ தொலைபேசி இல	E-mail/ විද්‍යුත් තැපෑල/ மின்னஞ்சல்	Signature/ අත්සන/ கையொப்பம்
01	B.M. සරභාගන සරසාර	විද්‍යාල විද්‍යාලික		071-8040583		
02	S.M.P.D. බණ්ඩාර	ප්‍රධාන විද්‍යාලික		0714650920		
03	P.V. Panchabandera	Principal retired		0718064050		
04	K.A.R. මොර් රජවංශ	ප්‍රධාන	මහා විද්‍යා මණ්ඩලය	0902085158	Sub.studentsunion@gmail.com	
05	K.A.B.L. බණ්ඩාර	ලිපිකරු	මහා විද්‍යා මණ්ඩලය	0715425818		
06	S.Y.M. සුමන	ප්‍රධාන	ශ්‍රී විද්‍යා විද්‍යාල මහා විද්‍යා මණ්ඩලය			
07	E.M. මොර් මහාසර	ප්‍රධාන	ආදර්ශ විද්‍යාල මහා විද්‍යා මණ්ඩලය			
08	ඉන්ද්‍රජිත් විජේසිංහ	ප්‍රධාන	විද්‍යාල විද්‍යාල මහා විද්‍යා මණ්ඩලය			

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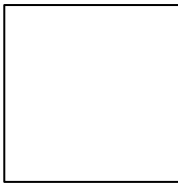
NEW TECHNOLOGY FACULTY DEVELOPMENT PROJECT IN UNIVERSITY OF SABARAGAMUWA						
Venue-			Date: 1st May 2018			
#	Name/නම/பெயர்	Designation/ කනකුල/புதவி	Organization/ සමාගම/ நிறுவனம்	Contact No/ දුරකථන අංකය/ தொலைபேசி இல	E-mail/ විද්‍යුත් තැපෑල/ மின்னஞ்சல்	Signature/ අත්සන/ கையொப்பம்
09	ජීවරත්න සමරසේන	ප්‍රධාන	නුලලනානුරත්න දකුණු ජීව විද්‍යා මණ්ඩලය			
10	K.N.V. කුමාරසිංහ	ප්‍රධාන	කොළඹ විද්‍යාල මහා විද්‍යා මණ්ඩලය			
11	ආචාර්ය ජයරත්න	ප්‍රධාන විද්‍යාලික විද්‍යාල	කොළඹ විද්‍යාල මහා විද්‍යා මණ්ඩලය			
12	Dr. චන්දිම මහාසර	ප්‍රධාන විද්‍යාලික	කොළඹ විද්‍යාල මහා විද්‍යා මණ්ඩලය			
13	Dr. ජයරත්න විජේසිංහ	ප්‍රධාන විද්‍යාලික	කොළඹ විද්‍යාල මහා විද්‍යා මණ්ඩලය			
14	Dr. K.R. රිකාන්ති මහාසර	ප්‍රධාන විද්‍යාලික	කොළඹ විද්‍යාල මහා විද්‍යා මණ්ඩලය	077 944 2935		
15	Dr. P.K.G.S.S. සමරසේන	ප්‍රධාන විද්‍යාලික	කොළඹ විද්‍යාල මහා විද්‍යා මණ්ඩලය			
16	Dr. ජයරත්න විජේසිංහ	Coordinator	Faculty Technology	0715346980		

NEW TECHNOLOGY FACULTY DEVELOPMENT PROJECT IN UNIVERSITY OF SABARAGAMUWA						
Venue-		Date: 1st May 2018				
#	Name/නම/பெயர்	Designation/ නනතුර/பதவி	Organization/ සමාගම/ நிறுவனம்	Contact No/ දුරකථන අංකය/ தொலைபேசி இல	E-mail/ විද්‍යුත් තැපෑල/ மின்னஞ்சல்	Signature/ අත්සන/ கையொப்பம்
17	Prof. M. Sunil shantha	Vice Chancellor	Sabaragamuwa University	0714468755	vc@sab.ac.lk	
18	O.S.P. Ovitigama	Osama Niladhari	Muttittuwagama	0771933268		
19	S.P. S. Bandula	S.P.	Muttittuwagama	0777419619	-	
20	N.M. Palitha Kottiyegoda	Teacher	Muttittuwagama Vidyalaya	0716582995	-	
21	D. Jayasinghe	senior lecturer	Muttittuwagama	0714453459	dul@sust.lk	
22	N.M. Palitha Kottiyegoda	සෙනෙසොල්ලා	-	045 2290054		නෙසෙසොල්ලා
23	J.L.C.K. Jayasinghe	Divisional Secretary	Emmalle	0711091797	jlckjayasinghe@gmail.lk	
24	Charmini Kodituwakke	Env: Compliance Specialist	TMS/ADB	0713664844	charminik@gmail.com	

NEW TECHNOLOGY FACULTY DEVELOPMENT PROJECT IN UNIVERSITY OF SABARAGAMUWA						
Venue-		Date: 1st May 2018				
#	Name/නම/பெயர்	Designation/ නනතුර/பதவி	Organization/ සමාගම/ நிறுவனம்	Contact No/ දුරකථන අංකය/ தொலைபேசி இல	E-mail/ විද්‍යුත් තැපෑල/ மின்னஞ்சல்	Signature/ අත්සන/ கையொப்பம்
25	Sithara Atapattu		TMS			
26						
27						
28						
29						
30						
31						
32						

ANNEX 06: BIQ

Application No



Central Environmental Authority
BASIC INFORMATION QUESTIONNAIRE
**Essential information to determine the environmental approval
requirement of projects**

(Note: Use separate sheets 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 in 1:50,000 scale 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 of1982		✓	
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 ft²

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,

² SUSL del

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)	Laying of pipelines	✓		
(vii)	Tunneling		✓	
(viii)	Power generation & transmission		✓	
(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. ESMP 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
- Clearance 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 in decision 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:

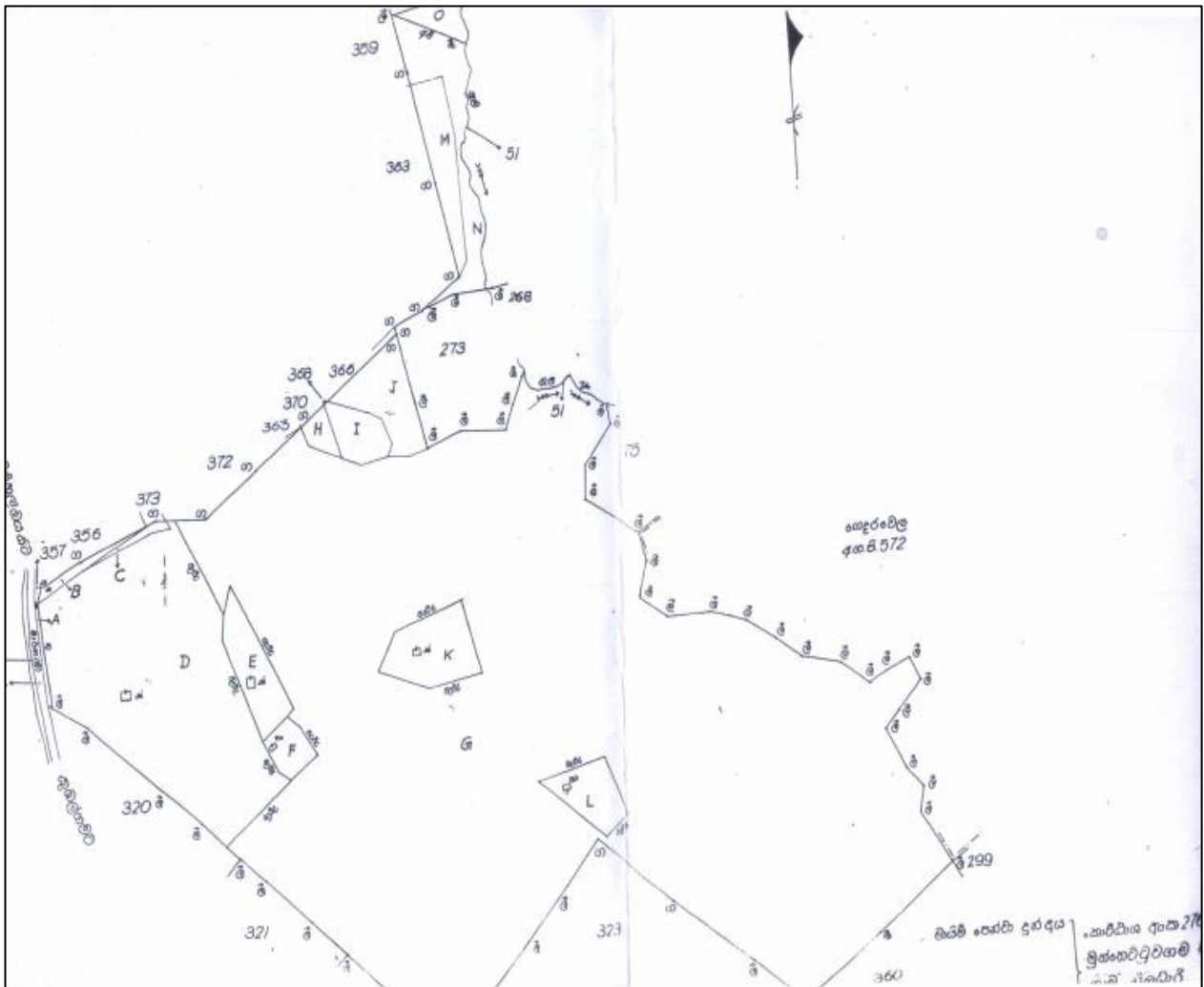
Special comments regarding significant environmental concerns (based on the site inspection):

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 07: SURVEY PLAN



ANNEX 08:
GAZZETE NOTIFICATION OF THE
LAND


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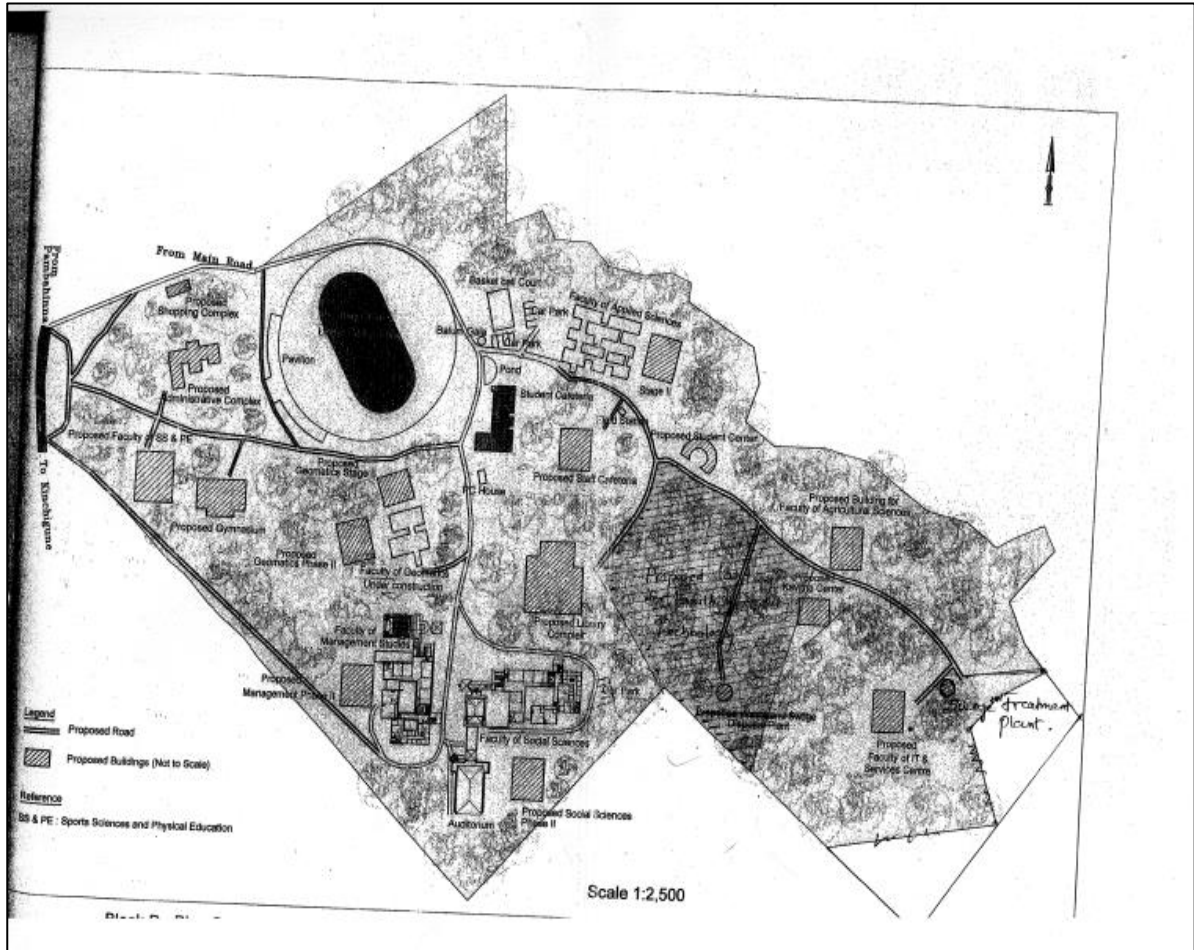
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1996 නොවැම්බර් මාස 09 දානි දැනට පවත්වාගෙන යාමේ ප්‍රදාන කළේන්ගේ නාම

<p>1. ඉඩම් අත්පත් කළේන්ගේ නාම - ප්‍රදාන කළේන්ගේ නාම</p> <p>2. ඉඩම් විස්තරය - පවත්වාගෙන යාමේ ප්‍රදාන කළේන්ගේ නාම</p> <p>3. ඉඩම් අත්පත් කළේන්ගේ නාම - මෙම පනත යටතේ පවත්වාගෙන යාමේ ප්‍රදාන කළේන්ගේ නාම</p> <p>4. ඉඩම් විස්තරය - මෙම පනත යටතේ පවත්වාගෙන යාමේ ප්‍රදාන කළේන්ගේ නාම</p>	<p>1. ඉඩම් අත්පත් කළේන්ගේ නාම - මෙම පනත යටතේ පවත්වාගෙන යාමේ ප්‍රදාන කළේන්ගේ නාම</p> <p>2. ඉඩම් විස්තරය - මෙම පනත යටතේ පවත්වාගෙන යාමේ ප්‍රදාන කළේන්ගේ නාම</p> <p>3. ඉඩම් අත්පත් කළේන්ගේ නාම - මෙම පනත යටතේ පවත්වාගෙන යාමේ ප්‍රදාන කළේන්ගේ නාම</p> <p>4. ඉඩම් විස්තරය - මෙම පනත යටතේ පවත්වාගෙන යාමේ ප්‍රදාන කළේන්ගේ නාම</p>
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ANNEX 09: MASTER PLAN



ANNEX 10:
LAYOUT PLAN

**ANNEX 11:
APPLICABLE ENVIRONMENTAL
LEGISLATIONS**

Applicable Environmental legislations

a) Environmental Impact Assessment

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.

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.

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.

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

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).

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.

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.

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.

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

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.

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)

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

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

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)

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

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.

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

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.

a) Sri Lanka Land Reclamation and Development Corporation Act No 15 of 1968

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.

j) Civil Aviation Act, No. 14 of 2010

This act to make provision for the regulation, control and matters related to civil aviation to give effect to the convention on international civil aviation and for matters connected therewith and incidental thereto.

k) Mines and Minerals Act No. 33 of 1992

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)

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 of one or more individuals.

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

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

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

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.

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

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

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

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.

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 and 1986

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) National Involuntary Resettlement Policy

The National Resettlement Policy (NIRP) is adopted in 2001 for the benefit of the persons displaced by the process of land acquisition for development purpose. NIRP ensures that people affected by development projects are treated in fair and equitable manner and to ensure that they are not impoverished in the process. It also enables establishing the framework for project planning and implementation. Involuntary resettlement is not encouraged and if it is unavoidable affected persons should be adequately compensated to reestablish them. Compensations should be based on replacement cost and grievance redress mechanisms should

be in place to resolve issues emanating from land acquisition. However BFL has not acquired land to expand their industry but land has been purchased from the private entities or obtains land on lease.

u) Land Acquisition Regulations, 2008

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.

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.

ANNEX 12:
RAPID BIO DIVERSITY ASSESSMENT
REPORT

2018

**Rapid Biodiversity Assessment Report of the
Proposed Site for the Technology Faculty of
Sabaragamuwa University of Sri Lanka**

**Sabaragamuwa University of Sri Lanka
P.O. Box 2, Belihuloya-70140
SRI LANKA**

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1. Introduction

The rapid biodiversity assessment (RBA) was developed in 1990 by Conservation International 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).

However, in order to be a truly responsible government institute, it is important to identify and understand the ecological related natural environment. 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.

Presently, Sabaragamuwa University of Sri Lanka is 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 highly committed to be positioned as an environmentally friendly higher educational institute in Sri Lanka.

Therefore, this RBA is an attempt to understand the ecological significance of the proposed site for the construction of new Technology Faculty.

2. Methodology – animal diversity

2.1 Study 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).

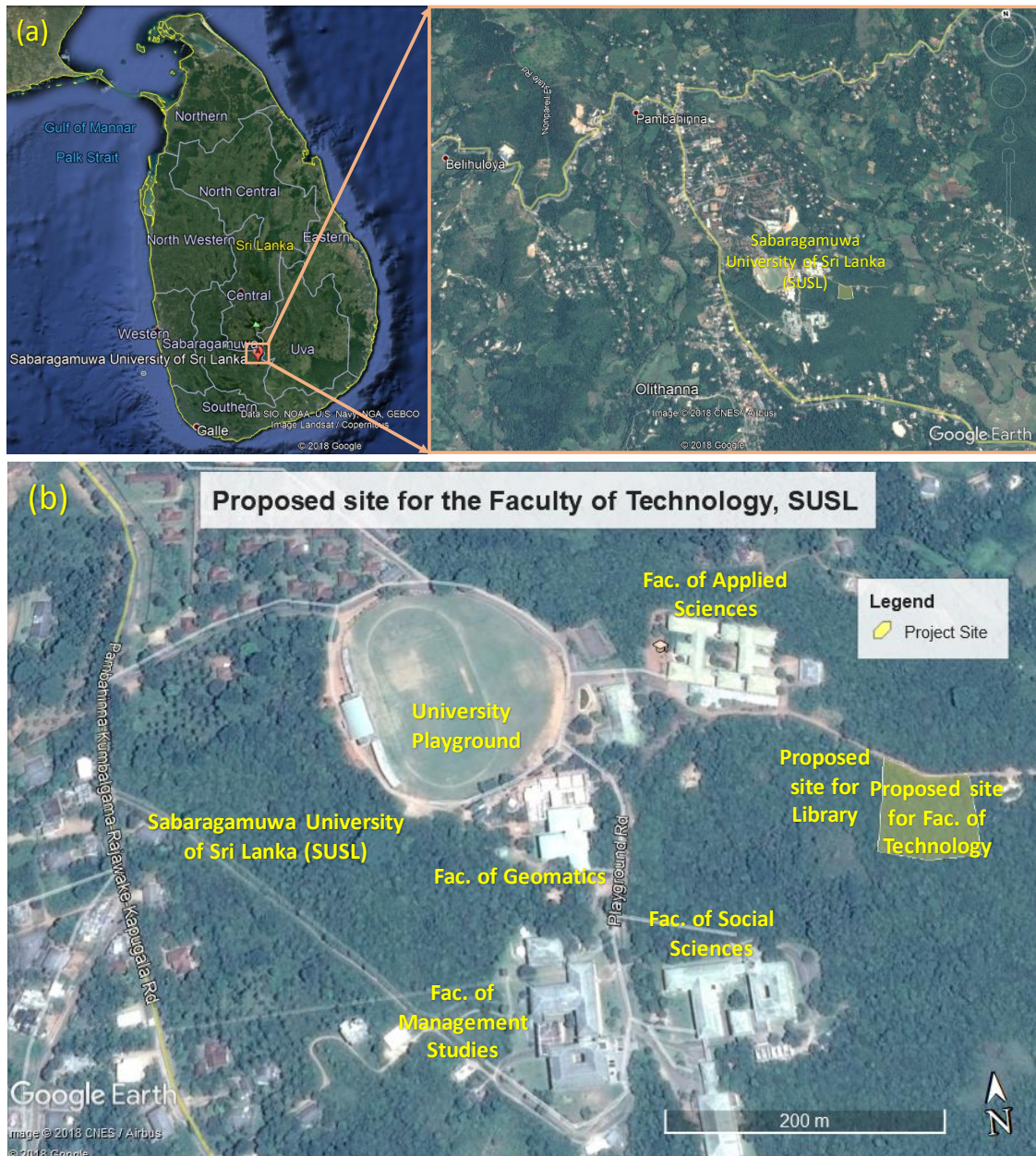


Figure 3. Location of the proposed site for the development of the Faculty of Technology of the Sabaragamuwa University of Sri Lanka

2.2 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 1, 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 1. 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 et al., 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)

2.3 Overall methodology

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 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) were 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.

2.4 Systematic sampling

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 100m² 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). 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 2. 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 supplement the checklists. Specific techniques used in recording species in each group are given in Table 3.

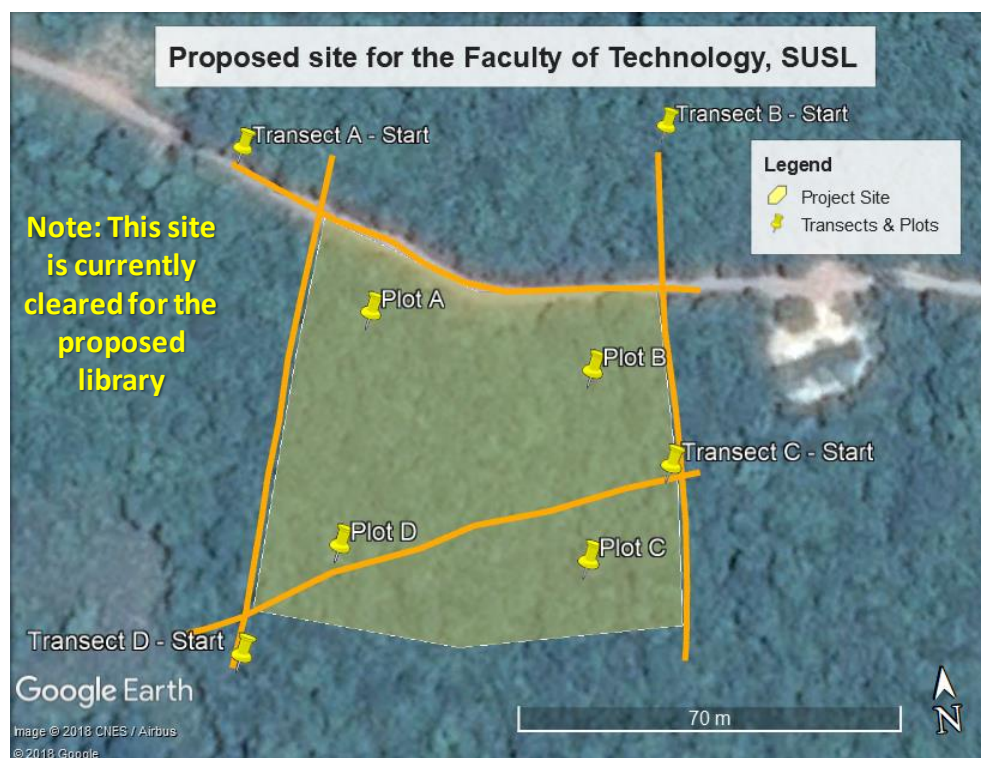


Figure 4. Placement of sampling sites (transects and litter plots) in proposed site for the development of the Faculty of Technology of the Sabaragamuwa University of Sri Lanka

Table 2. 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 3. 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); 2 transects in the afternoon (A on two days)
Mammals	Sherman Trapping Opportunistic observations Previous records	Nocturnal Sherman trapping (200 trap hours)

2.5 Results of the animal diversity

The study reported 144 species including 98 vertebrate species representing 50 families and 46 species from the selected invertebrate taxa representing 11 families to inhabit the moist-semi-evergreen forest patch in the project area and its periphery, including those disturbed/developed areas outside the immediate periphery. This include species 17 endemic to Sri Lanka, while none of them are restricted-range species within the study area. Further 12 species among them are listed as nationally threatened species (MoE, 2012). 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. Table 5 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. Detailed checklists of all recorded species are given in the table 6.

Table 4. 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	5 (50%)	5 (50%)
Odonates	7	0	0
Butterflies	29	2 (6.9%)	2 (6.9%)
Amphibians	5	2 (40%)	0
Reptiles	16	2 (12.5%)	1 (6.3%)
Birds	68	5 (7.4%)	1 (1.5%)
Mammals	9	1 (11.1%)	3 (33.3%)
TOTAL	144	17 (11.8%)	12 (8.3%)

Results given in the Table 4 suggests the project site to harbour a moderately high species richness within the study taxa also indicating considerable (above average) percentages of endemic and threatened species in some taxa such as the land snails, reptiles and amphibians. Critical species and population 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 5. 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	0.639	No specimens	No specimens	No specimens	×	0.32	Very low diversity
	1-D	(single species)	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	

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 landsnail fauna among the taxonomic groups selected for the present study. On a specific note on the methodology, 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 afternoon-evening showers during the sampling period.

2.6 Critical species/populations

Among the land snails recorded during the study, the Sri Lankan endemic and critically endangered Sri Lanka Lucid Satiella Snail (*Satiella membranacea*) is of high conservation significance. Further, two endangered species i.e. Itier's Operculate Snail (*Aulopoma itieri*) and Sphaeroid's Operculate Snail (*Aulopoma sphaeroidium*) and two other 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*), while all four species are endemic to Sri Lanka. 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. 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).

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.

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.

Two reptile species of conservation concern, the vulnerable endemic Zara's hump-nosed viper (*Hypnale zara*) and the near threatened green keelback (*Macropisthodon plumbicolor*) listed here were 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).

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.

Table 6. 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	<i>Lissachatina fulica</i>	Giant African Snail	IAS	NE	√	√	√
Ariophantidae	<i>Cryptozona bistrialis</i>	Common Translucent Snail	Ind	LC	√	√	√
Ariophantidae	<i>Macrochlamys indica</i>	Macro Lucid Snail	Exo	NE	√		√
Ariophantidae	<i>Ratnadvipia irradians</i>	Sri Lanka Ratnadeepa Snail	End	VU	√	√	
Ariophantidae	<i>Satiella membranacea</i>	Sri Lanka Lucid Satiella Snail	End	CR	√	√	
Camaenidae	<i>Beddomea trifasciatus</i>	Three-banded Beddomea Snail	End	VU	√		√
Cyclophoroidea	<i>Aulopoma itieri</i>	Itier's Operculate Snail	End	EN	√	√	√
Cyclophoroidea	<i>Aulopoma sphaeroidium</i>	Sphaeroid's Operculate Snail	End	EN	√		√
Glessulidae	<i>Glessula sp A</i>	Corkscrew Snail Species (short)	Ind	DD	√		√
Glessulidae	<i>Glessula sp B</i>	Corkscrew Snail Species (long)	Ind	DD	√		√
ORDER ODONATA: Dragonflies and Damselflies							
Libellulidae	<i>Acisoma panorpoides</i>	Asian Pintail	Ind	LC	√		√
Libellulidae	<i>Brachythmis contaminata</i>	Asian Groundling	Ind	LC	√		√
Libellulidae	<i>Diplacodes trivialis</i>	Blue Percher	Ind	LC	√	√	√
Libellulidae	<i>Neurothemis tullia</i>	Pied Parasol	Ind	LC	√		√
Libellulidae	<i>Orthetrum luzonicum</i>	Marsh Skimmer	Ind	NT	√		√
Libellulidae	<i>Orthetrum sabina</i>	Green Skimmer	Ind	LC	√		√
Libellulidae	<i>Pantala flavescens</i>	Wandering Glider	Ind	LC	√	√	√

ORDER LEPIDOPTERA: Butterflies							
Hesperiidae	<i>Baracus vittatus</i>	Sri Lankan Hedge Hopper	End	VU	√		√
Hesperiidae	<i>Pelopidas conjuncta</i>	Conjoined Swift	Ind	VU	√		√
Hesperiidae	<i>Potanthus confuscus</i>	Tropic Dart	Ind	LC		√	√
Hesperiidae	<i>Taractrocera maeivus</i>	Common Grass Dart	Ind	LC	√		√
Lycaenidae	<i>Caleta decidia</i>	Angled Pierrot	Ind	LC		√	√
Lycaenidae	<i>Castalius rosimon</i>	Common Pierrot	Ind	LC	√		√
Lycaenidae	<i>Jamides celeno</i>	Common Cerulean	Ind	LC	√		√
Lycaenidae	<i>Loxura atymnus</i>	Yamfly	Ind	LC	√		√
Lycaenidae	<i>Prosotas nora</i>	Common Lineblue	Ind	LC	√		√
Nymphalidae	<i>Charaxes athamas</i>	Nawab	Ind	LC	√		√
Nymphalidae	<i>Elymnias hypermnestra</i>	Common Palmfly	Ind	LC	√		√
Nymphalidae	<i>Euploea sylvester</i>	Double banded Crow	Ind	NT		√	√
Nymphalidae	<i>Euploea core</i>	Common Indian Crow	Ind	LC	√		√
Nymphalidae	<i>Melanitis phedima</i>	Dark Evening Brown	Ind	NT	√		√
Nymphalidae	<i>Mycalesis subdita</i>	Common Bush Brown	Ind	LC	√		√
Nymphalidae	<i>Neptis hylas</i>	Common Sailor	Ind	LC	√		√
Nymphalidae	<i>Parantica aglea</i>	Glassy Tiger	Ind	LC	√	√	√
Nymphalidae	<i>Tirumala limniace</i>	Blue Tiger	Ind	LC	√		√
Papilionidae	<i>Graphium sarpedon</i>	Common Bluebottle	Ind	LC	√		√
Papilionidae	<i>Pachliopta aristolochiae</i>	Common Rose	Ind	LC	√		√
Papilionidae	<i>Papilio clytia</i>	Mime	Ind	LC	√		√
Papilionidae	<i>Papilio polymnestor</i>	Blue Mormon	Ind	LC	√		√
Papilionidae	<i>Papilio polytes</i>	Common Mormon	Ind	LC	√		√
Papilionidae	<i>Troides darsius</i>	Common Birdwing	End	LC	√		√
Pieridae	<i>Catopsilia pomona</i>	Lemon Emigrant	Ind	LC	√	√	√

Pieridae	<i>Cepora nerissa</i>	Common Gull	Ind	LC	√		√
Pieridae	<i>Delias eucharis</i>	Common Jezebel	Ind	LC	√	√	√
Pieridae	<i>Eurema blanda</i>	Three-spot Grass Yellow	Ind	LC	√		√
Pieridae	<i>Leptosia nina</i>	Psyche	Ind	LC	√		√
CLASS AMPHIBIA: Only frogs and toads are considered							
Bufoidea	<i>Duttaphrynus melanostictus</i>	Common house toad	Ind	LC	√	√	√
Dicroglossidae	<i>Euphlyctis cyanophlyctis</i>	Skipper frog	Ind	LC	√	√	√
Dicroglossidae	<i>Fejervarya cf. limnocharis</i>	Common paddy field frog	Ind	LC	√		√
Rhacophoridae	<i>Pseudophilautus popularis</i>	Common shrub frog	End	NT	√		√
Rhacophoridae	<i>Pseudophilautus sp</i>	Shrub frog species	End	DD	√		√
CLASS REPTILIA: Only lizards & snakes are considered							
Elapidae	<i>Naja</i>	Indian cobra	Ind	LC			√
Agamidae	<i>Calotes calotes</i>	Green garden lizard	Ind	LC	√		√
Agamidae	<i>Calotes versicolor</i>	Common garden lizard	Ind	LC	√		
Colubridae	<i>Ahaetulla nasuta</i>	Green vine snake	Ind	LC		√	√
Colubridae	<i>Boiga ceylonensis</i>	Sri Lanka cat snake	Ind	LC	√		
Colubridae	<i>Coelognathus helena</i>	Trinket snake	Ind	LC			√
Colubridae	<i>Dendrelaphis tristis</i>	front Spot bronze back	Ind	LC		√	√
Colubridae	<i>Lycodon striatus</i>	Shaw's wolf snake	Ind	LC			√
Colubridae	<i>Ptyas mucosa</i>	Rat snake	Ind	LC			√
Natricidae	<i>Macropisthodon plumbicolor</i>	The green keelback	Ind	NT			√
Scincidae	<i>Eutropis carinata</i>	Common skink	Ind	LC	√		
Scincidae	<i>Lankascincus sp</i>	An undescribed lankaskink	End	DD	√		
Varanidae	<i>Varanus bengalensis</i>	Land monitor	Ind	LC			√
Viperidae	<i>Daboia russelii</i>	Russell's viper	Ind	LC		√	

Viperidae	<i>Hypnale hypnale</i>	The Merrem's hump nose viper	Ind	LC		√
Viperidae	<i>Hypnale zara</i>	Zara's hump-nosed viper	End	VU		√
CLASS AVES: Birds						
Accipitridae	<i>Accipiter badius</i>	Shikra	BrR	LC		√
Accipitridae	<i>Spilornis cheela</i>	Crested Serpent Eagle	BrR	LC	√	√
Aegithinidae	<i>Aegithina tiphia</i>	Common lora	BrR	LC	√	√
Alcedinidae	<i>Halcyon smyrnensis</i>	White-throated Kingfisher	BrR	LC		√
Apodidae	<i>Apus affinis</i>	House Swift	BrR	LC		√
Apodidae	<i>Collocalia unicolor</i>	Indian Swiftlet	BrR	LC	√	
Apodidae	<i>Cypsiurus balasiensis</i>	Asian Palm Swift	BrR	LC	√	√
Bucerotidae	<i>Ocyrceros gingalensis</i>	Sri Lanka Grey Hornbill	End	LC		√
Campephagidae	<i>Coracina melanoptera</i>	Black-headed Cuckooshrike	BrR	LC	√	√
Campephagidae	<i>Pericrocotus cinnamomeus</i>	Small Minivet	BrR	LC	√	√
Campephagidae	<i>Pericrocotus flammeus</i>	Scarlet Minivet	BrR	LC	√	√
Caprimulgidae	<i>Caprimulgus asiaticus</i>	Common Nightjar	BrR	LC		√
Chloropseidae	<i>Chloropsis jerdoni</i>	Blue-winged Leafbird	BrR	LC	√	√
Cisticolidae	<i>Prinia inornata</i>	Plain Prinia	BrR	LC		√
Columbidae	<i>Chalcophaps indica</i>	Emerald Dove	BrR	LC	√	
Columbidae	<i>Columba livia</i>	Domestic Pigeon	BrR	NE		√
Columbidae	<i>Ducula aenea</i>	Green Imperial Pigeon	BrR	LC	√	√
Columbidae	<i>Streptopelia chinensis</i>	Spotted Dove	BrR	LC	√	√
Columbidae	<i>Treron pompadora</i>	Pompadour Green-pigeon	End	LC	√	√
Corvidae	<i>Corvus levaillantii</i>	Large-billed Crow	BrR	LC	√	
Corvidae	<i>Corvus splendens</i>	House Crow	BrR	LC		√
Cuculidae	<i>Centropus sinensis</i>	Greater Coucal	BrR	LC	√	√
Cuculidae	<i>Clamator coromandus</i>	Chestnut-winged Cuckoo	WV	NE		√

Cuculidae	<i>Cuculus micropterus</i>	Indian Cuckoo	WV	NE			√
Cuculidae	<i>Eudynamys scolopacea</i>	Asian Koel	BrR	LC	√	√	
Cuculidae	<i>Phaenicophaeus viridirostris</i>	Blue-faced Malkoha	BrR	LC		√	√
Dicaeidae	<i>Dicaeum erythrorhynchos</i>	Pale-billed Flowerpecker	BrR	LC	√		√
Dicruidae	<i>Dicrurus caerulescens</i>	White-bellied Drongo	BrR	LC	√		√
Estrididae	<i>Lonchura punctulata</i>	Scaly-breasted Munia	BrR	LC	√	√	√
Estrididae	<i>Lonchura striata</i>	White-rumped Munia	BrR	LC		√	√
Hirundinidae	<i>Hirundo daurica</i>	Red-rumped Swallow	BrR	LC		√	√
Meropidae	<i>Merops leschenaulti</i>	Chestnut-headed Bee-eater	BrR	LC			√
Meropidae	<i>Merops orientalis</i>	Green Bee-eater	BrR	LC			√
Meropidae	<i>Merops philippinus</i>	Blue-tailed Bee-eater	WV	CR		√	√
Monarchidae	<i>Hypothymis azurea</i>	Black-naped Monarch	BrR	LC	√		
Monarchidae	<i>Terpsiphone paradisi</i>	Asian Paradise- flycatcher	BrR	LC		√	√
Muscicapidae	<i>Copsychus malabaricus</i>	White-rumped Shama	BrR	LC	√		
Muscicapidae	<i>Copsychus saularis</i>	Oriental Magpie Robin	BrR	LC		√	√
Muscicapidae	<i>Saxicoloides fulicata</i>	Indian Robin	BrR	LC		√	√
Nectariniidae	<i>Nectarina asiatica</i>	Purple Sunbird	BrR	LC	√	√	√
Nectariniidae	<i>Nectarina lotenia</i>	Loten's Sunbird	BrR	LC	√		√
Nectariniidae	<i>Nectarina zeylonica</i>	Purple-rumped Sunbird	BrR	LC	√		√
Oriolidae	<i>Oriolus xanthornus</i>	Black-hooded Oriole	BrR	LC	√		√
Passeridae	<i>Passer domesticus</i>	House Sparrow	BrR	LC			√
Phasianidae	<i>Gallus lafayetii</i>	Sri Lanka Junglefowl	End	LC	√		√
Phasianidae	<i>Pavo cristatus</i>	Indian Peafowl	BrR	LC			√
Picidae	<i>Dinopium psarodes</i>	Sri Lanka Lesser Flameback	End	LC	√		
Pittidae	<i>Pitta brachyura</i>	Indian Pitta	WV	NE			√
Psittacidae	<i>Loriculus beryllinus</i>	Sri Lanka Hanging Parakeet	End	LC			√
Psittacidae	<i>Psittacula krameri</i>	Rose-ringed Parakeet	BrR	LC	√		√

Pycnonotidae	<i>Hypsipetes leucocephalus</i>	Black Bulbul	BrR	LC		√	√
Pycnonotidae	<i>Pycnonotus cafer</i>	Red-vented Bulbul	BrR	LC	√		√
Pycnonotidae	<i>Pycnonotus luteolus</i>	White-browed Bulbul	BrR	LC	√		√
Pycnonotidae	<i>Pycnonotus melanicterus</i>	Black-crested Bulbul	End	LC	√		
Rallidae	<i>Rallina eurizonoides</i>	Slaty-legged Crake	BrR	VU		√	
Ramphastidae	<i>Megalaima haemacephala</i>	Coppersmith Barbet	BrR	LC			√
Ramphastidae	<i>Megalaima zeylanica</i>	Brown-headed Barbet	BrR	LC	√		√
Rhipiduridae	<i>Rhipidura aureola</i>	White-browed Fantail	BrR	LC			√
Strigidae	<i>Bubo nipalensis</i>	Spot-bellied Eagle Owl	BrR	NT		√	
Sturnidae	<i>Acridotheres tristis</i>	Common Myna	BrR	LC	√	√	√
Sturnidae	<i>Gracula religiosa</i>	Hill Myna	BrR	LC	√		
Sylviidae	<i>Orthotomus sutorius</i>	Common Tailorbird	BrR	LC	√		√
Timalidae	<i>Dumetia hyperythra</i>	Tawny-bellied Babbler	BrR	LC		√	√
Timalidae	<i>Pellorneum fuscicapillum</i>	Sri Lanka Brown-capped Babbler	End	LC	√		√
Timalidae	<i>Pomatorhinus melanurus</i>	Sri Lanka Scimitar Babbler	End	LC		√	
Timalidae	<i>Rhopocichla atriceps</i>	Dark-fronted Babbler	BrR	LC	√		
Timalidae	<i>Turdoides affinis</i>	Yellow-billed Babbler	BrR	LC		√	√
Zosteropidae	<i>Zosterops palpebrosus</i>	Oriental White-eye	BrR	LC		√	√

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

3. Methodology – plant diversity

Five sampling quadrates (20m x 10m) were demarcated at four edges and on the middle representing the proposed faculty area (Figure 3).

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 such as (Senaratna, 2001).

3.1 Calculation of Shannon wiener species diversity index

Shannon wiener species diversity index was employed in order to calculate as 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.

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

H' - Shannon-Wiener Diversity Index

P_i - Proportion of each species in the sample



Figure 5. Placement of plant sampling sites (plots) in proposed site for the development of the Faculty of Technology of the Sabaragamuwa University of Sri Lanka

3.2 Results of the plant diversity

3.2.1 Vegetation type and floral composition

Biogeographically, the proposed project area falls 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 7) and with some other shrubs, herbs, orchids and ferns. Further few trees species found with less than 10 cm dbh (Table 8).

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 -1.36 for the total survey area. 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 7).

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 8).

Table 7. 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	EVOLUTIONARY STATUS	CONSERVATION STATUS	RECORDED FROM		
								Project Site	Periphery	Outside
Rutaceae	<i>Acronychia pedunculata</i>	Ankenda	16.7	7.00	8.89	Native	LC	√		√
Lauraceae	<i>Cinnamomum citriodorum</i>	Pangiri Kurundu	21.5	6.35	22.22	Endemic	VU	√	√	√
Apocynacea	<i>Pagiantha dichotoma</i>	Divi Kaduru	14.8	7.00	6.67	Native	LC	√		√
Symplocaceae	<i>Symplocos cochinchinensis</i>	Bombu	13.0	6.50	4.44	Native	LC	√		
Myrtaceae	<i>Syzygium zeylanicum</i>	Yakada Maran	16.0	4.88	55.5	Native	LC	√	√	√
Myrtaceae	<i>Syzygium sp.</i>		10.0	3.50	2.20			√		√

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

Table 8. 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	EVOLUTIONARY STATUS	CONSERVATION STATUS	RECORDED FROM		
					Project Site	Periphery	Outside
Tree species (< 10 cm DBH)							
Ochnaceae	<i>Gomphia serrata</i>	Mal keera	Native	LC	✓		✓
Thymelaeaceae	<i>Gyrinops walla</i>	Walla Patta	Native	VU	✓	✓	✓
Rubiaceae	<i>Psychotria nigra</i>		Native	LC	✓		✓
Climbers							
Smilacaceae	<i>Smilax zeylanica</i>	Kabaressa	Native	LC	✓	✓	✓
Shrubs/Herbs							
Xanthorrhoeaceae	<i>Dianella ensifolia</i>	Monara pethan	Native	LC	✓	✓	✓
Melastomataceae	<i>Osbeckia octandra</i>	Heen Bovitiya	Endemic	LC	✓	✓	✓
Melastomataceae	<i>Clidemia hirta</i>	Katakalu Bovitiya	Introduced	LC	✓	✓	✓
Rubiaceae	<i>Gaertnera walkeri</i>		Endemic	NT	✓		✓
Iridaceae	<i>Aristea</i> sp.				✓		✓
Rubiaceae	<i>Lasianthus</i> sp.				✓		✓
Orchids							
Orchidaceae	<i>Dendrobium aphyllum</i>	Poson Mal	Native	LC	✓		✓
Orchidaceae	<i>Polystachya concreta</i>		Native	LC	✓		✓

Ferns							
Polypodiaceae	<i>Drynaria quercifolia</i>	Benduru	Native	LC	√		√
Lindsaeaceae	<i>Lindsaea repens</i>		Native	CR	√	√	√
Schizaeaceae	<i>Schizaea digitata</i>		Native	NT	√	√	√

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

4. Conclusions and recommendations

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, 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. Nevertheless, 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, if possible; it is proposed to maintain small forest patches where necessary within the university premises as that has already been practiced. 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.

5. Acknowledgements

We are particularly grateful to Dr. Sampath Wahala, Lecturer, Eco-Business Management, Dept. of Tourism Management, Faculty of Management Studies, Sabaragamuwa University of Sri Lanka for his advice and the support immensely helped us to improve the quality of this report. Further, enormous thanks are due to two Demonstrators (Mr. Prasad Tharanga and Ms. Iresha Balasooriya) and six Undergraduates (Mr. J.M.R. Sameera, Mr. H.A.T. Chinthaka, Ms. L.A.S. Dilhara, Ms. H.D.C.L. Oshadi, Ms. M.M. Wijesooriya and Ms. R.D.M.G. Jayalath) attached to Dept. of Natural Resources, Faculty of Applied Sciences, Sabaragamuwa University of Sri Lanka for providing vast support to carried out RBA field surveys.

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ANNEX 13: AIR QUALITY PARAMETERS

THE NATIONAL ENVIRONMENTAL ACT, NO. 47 OF 1980

Regulations

The National Environmental (Ambient Air Quality) Regulations, 1994, published in *Gazette Extraordinary*, No. 850/4 of December, 1994 are hereby amended by the substitution for the Schedule to that regulation of the following :-

"SCHEDULE

Pollutant	Averaging Time*	Maximum Permissible Level		+ Method of measurement
		μgm^{-3}	ppm	
1. Particulate Matter - Aerodynamic diameter is less than $10 \mu\text{m}$ in size (PM_{10})	Annual	50	—	Hi-volume sampling and Gravimetric or Beta Attenuation
	24 hrs.	100	—	
2. Particulate Matter - Aerodynamic diameter is less than $2.5 \mu\text{m}$ in size ($\text{PM}_{2.5}$)	Annual	25	—	Hi-volume sampling and Gravimetric or Beta Attenuation
	24 hrs.	50	—	

Pollutant	Averaging Time*	Maximum Permissible Level		+ Method of measurement
		μgm^{-3}	ppm	
3. Nitrogen Dioxide (NO_2)	24 hrs.	100	0.05	Colorimetric using saltzman Method or equivalent Gas phase chemiluminescence
	8 hrs.	150	0.08	
	1hr.	250	0.13	
4. Sulphur Dioxide (SO_2)	24 hrs.	80	0.03	Pararosaniline Method or equivalent Pulse Fluorescent
	8 hrs.	120	0.05	
	1hrs.	200	0.08	
5. Ozone (O_3)	1 hr.	200	0.10	Chemiluminescence Method or equivalent Ultraviolet photometric
6. Carbon Monoxide (CO)	8 hrs.	10,000	9.00	Non-Dispersive Infrared Spectroscopy"
	1 hr.	30,000	26.00	
	Any time	58,000	50.00	

* Minimum number of observations required to determine the average over the specified period —

03 hour average	-	03 consecutive hourly average
08 hour average	-	08 hourly average
24 hour average	-	18 hourly average
Yearly average	-	09 monthly average with at least 02 monthly average each quarter.

+ By using Chemicals or Automatic Analysers.

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.

<u>Item of Account</u>	<u>Value</u>	<u>Evidence not made available</u>
	Rs.	
Lands	54,196,566	Title Certificates/ Vesting Orders
Buildings	2,438,155,680	
Water Purifying Units	9,113,148	Registers of Fixed Assets
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	Detailed Schedules
Computer Accessories	267,481,996	
Stocks written-off from books	54,032	
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.

<u>Reference to Laws, Rules, Regulations, etc.</u>	<u>Non-compliance</u>
(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.

<u>Areas of System and Controls</u>	<u>Observations</u>
(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.

ANNEX 15: COMPLAINS FORM

INITIAL ENVIRONMENT EXAMINATION FOR SABARAGAMUWA UNIVERSITY OF SRI LANKA FACULTY OF
TECHNOLOGY

PART III: ESMP

ENVIRONMENTAL & SOCIAL MANAGEMENT PLAN

Activity Title: Proposed Faculty of Computing and Technology Building Complex of Sabaragamuwa University of Sri Lanka

District: Ratnapura

Local Authority: - Impulpe Pradeshiya Saba

Implementing Partner: Ministry of Higher Education / 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 Local Authority building approval is 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: Impulpe Pradeshiya Sabha.(building pan approval) UDA – for Green Building application. NBRO – for land stability and adoption of soil conservation measures	Impulpe Pradeshiya Saba clearance. NBRO clearance. Green Building Application Process Certification process commenced.	PIU(I)	Project cost	Before construction
Public consultations	Unless regular consultations are carried out with the stakeholders	Continue information dissemination, consultations, and involvement or	Disclosure records; consultations	PIU (M & I)	Project cost	During Preparation of IEE report.

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
	including community, issues that crop up during the project will go un-addressed leading to problems later on.	participation of stakeholders during project implementation.				Once in 6 months during construction
Establishment of baseline environmental conditions prior to start of civil works	<p>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.</p> <p>Impact of vibration noise, ground water pollution due to solid and waste water disposal etc.</p>	<p>(a) Conduct documentation of areas for construction (camp, storage stockpiling, etc.) and surroundings (within direct impact zones). Include photos and GPS coordinates.</p> <p>(b) Conduct base line monitoring in respect of ambient air quality, water quality, and noise levels as per monitoring plan.</p> <p>(c) Thus, baseline monitoring for water quality, noise, vibration will be audited prior to the start of construction and during site supervision.</p>	Records and photographs	PIU (I&M)	Project cost	Once prior to construction and thereafter quarterly.
DESIGN						
Sustainability	Lack of sufficient planning to assure long-term sustainability of the improvements and	Design has to include provisions for ensuring effective maintenance and protection of the Faculty in the	Verification of the design parameters	PIU (I)	Project cost	Before 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
	ensure protection of the Faculty.	long-term. Ensure long term sustainability by considering Standards Codes for design (such as UDA), appropriate wind load factor, and detailed design after carrying geotechnical investigations. The initial designs of Faculty's academic building should consider that net allowable carrying capacity of XXXMN/m ² . Since the detailed designs were not made available at the time of soil investigation no details were provided. Therefore consult and obtain recommendations from NBRO with detail design and load transfer.	Geo technical and topography report in place			
Integration of energy efficiency and energy conservation programs in design of project	Unsustainable, energy inefficient, and uneconomical unviable building will negatively impact the environment In the absence of water conservation and energy efficiency of the	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.	Specifications for rain water harvesting structures, electrical fixtures, details of water heating system	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
components. Noncompliance of green building guidelines	building structure, it may lead to resource constrains and increase the running cost.	<ul style="list-style-type: none"> - 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 collection. 	Observations Check whether energy efficient lighting systems are installed			
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	<ul style="list-style-type: none"> (a) Design a waste water treatment plant taking into account recommendations from CEA. (b) Establish a waste water management plan 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

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
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
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.	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
		(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 unskilled and skilled workers for the proposed construction activities can reduce the requirement of land for labour camps. (g) Use local materials as much as possible 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.				
Disaster management	Extreme climate events such as intense rainfall (earth slips), cyclone (especially since site is located in high wind	(a) Adoption of appropriate disaster risk reduction strategy, emergency preparedness and recovery, training/orientation	Disaster Management Plan in place for the	PIU (M) Contractor (I) Maintenance	Project cost	Before 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
	<p>area) etc. and fire may cause damages to lives and property.</p> <p>Absence of roofing design feature to withstand strong winds may lead to damage and injury.</p>	<p>program for lecturers and students and construction worker, etc.</p> <p>(b) Identify an emergency evacuation point in the building in case of fire or another emergency.</p> <p>(c) An emergency alarm system has to be in place in all the buildings.</p> <p>(d) Should adopt structural features to support high wind conditions.</p> <p>(e) Should follow guidelines provided by NBRO as it is in a potential land slide area (to be confirmed by applying for NBRO clearance).</p> <p>(f) Carry out an assessment of direction of wind and adoption of possible mitigatory measure</p> <p>(g) Liase with the disaster management center</p>	<p>Engineering Faculty.</p> <p>Review of NBRO clearance. Wind and climatological assessment in place and vulnerability assessment done</p>			

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
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.	Plan for fire extinguishers, fire alarms and a staircase for emergency evacuations. Necessary cut-off switches and other safety measures incorporated into the design of especially the laboratories and workshops. Have sufficient accessibility space for the movement of a fire truck right around the building	Review of design plans for fire and operational safety.	PIU (M) Architect/ Project engineer.	Project cost	At design stage and during construction.
CONSTRUCTION PHASE						
Site Clearance 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.	(a) Permanent and temporary work should be undertaken to control soil erosion, sedimentation and water pollution. (b) Top soil generated from construction sites should be stored properly. (c) Use of silt traps and erosion control measures close to water bodies is also necessary. (a) Construction activities including earth work and	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
		construction of cross drainages should be conducted during the dry season.				

<p>Land preparation</p>	<p>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 secondary forest. Noise generated from construction vehicles, equipment, and vehicle traffic has the potential to disturb breeding, foraging, and migrating behavior of wild species</p>	<p>(a) Awareness programs should be organized for the workforce about the importance of the ecology of the forest. (b) If protected species are found within the forested area contact Timber Corporation and obtain approval for removal. (c) Contractor should especially be aware not to introduce any alien species during construction related activities. (d) Saplings for tree planting program should comprise of native species. Please get advice from the Forest Department for compatible plants species. The practices that should be adopted are available in the MOMDE website</p>	<p>Site observation and reporting. Check for the CEA NBRO approval letter. Permits for protected species removal from State Timber Cooperation</p>	<p>PIU(M) Contractor (I) Project site Engineer (I)</p>	<p>Project cost</p>	<p>During construction</p>
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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
Biodiversity and maintaining the ecological balance	Loss of secondary forest patch as a result of project activities will impact the ecosystem services such as provisioning, regulating etc	<ul style="list-style-type: none"> (a) Habitat enrichment activities to carried out with the recommended list of species in the project site (b) Workers and student be made aware on protection status of the species found in the area (c) Take precaution to conserve and manage them (d) Demarcate the southern border of the project site as a conservation area for the faculty. Refer the RAP biodiversity assessment conclusion. 	Planting of recommended species in the identified gaps and locations	PIU (M and implementation)	Project cost	Through the project cycle
Drinking water availability at construction camp and construction site	Non-availability of drinking water for labours will result in dehydration and health risk. Especially true for this site as this is a water scarce area and currently the Sabaragamuwa University of Sri Lanka (SUSL) does not have a pipe borne water to cater for the demand of the	<ul style="list-style-type: none"> (e) 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. (f) The drinking water will be stored in a suitable size storage tank to ensure uninterrupted availability. 	Water supply source and availability of water identified. Water availability plan.	PIU (M) Contractor (I)	Contractor Fee	Regularly during 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
	university during dry months of the year .(Refer Sabaragamuwa University of Sri Lanka Auditor General's report on Annex 14)	(g) 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. (h) 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.				
Arrangement for construction water in the event water requirement is large for construction and cannot be supported by	Delayed and interruption water supply leads to economic cost	The contractor shall provide a list of locations and type of sources from where water for construction shall be acquired. 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	Source of water used by the tanker	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
the pipe water supply.		municipality and consult PIU before finalizing the source.				
Use and transport of natural resources	Impact on the natural ecosystem by means of exploitation. Extraction, transportation and storage of construction materials may give negative impact such as noise, air, water, soil pollution, reduction of scenic beauty	<ul style="list-style-type: none"> a) Extraction of construction materials should be undertaken only from mines and quarries approved by GS&MB b) Environmental requirements and guidelines issued by the CEA, and LAs should be followed with respect of locating material extraction sites c) Transport, loading and unloading of construction materials should not cause nuisance, noise, vibration and dust d) Sand, rubble, metal bitumen and cement should be covered to ensure protection from dust to avoid emissions. 	Availability of permits at the raw material extraction sites Observation and reporting	PIU (M) Contractor (I)	Contractor Fee	During construction period
Transport of construction material	Transportation of construction materials on road network can cause	(a) The Contractor should obtain permits from LAs to use local roads prior to transportation of	Check for contractors' permits from	PIU (M) Contractor (I)	Contractor Fee	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
	<p>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.</p>	<p>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.</p>	<p>LAs to use local roads. Check and observe whether construction materials are carried beyond the carrying capacity. Observations on unloading and storage.</p>			
On Site housekeeping	Lack of solid waste, sanitation management, and storage of material	(a) Pre-identified waste disposal site by the contractor should exclude	Waste disposal sites identified.	PIU (M) Contractor (I)	Contractor fee	Regularly during the 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
	<p>on site can lead to lack of general cleanliness and impact on ecology, public health and scenic beauty.</p>	<p>areas which are close to public and sensitive environment (including forested areas).</p> <p>(b) A solid waste management plan will be prepared by the contractor in consultation with Local Authorities</p> <p>(c) Make arrangements with the local authority on disposal of solid waste generated during construction</p> <p>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</p> <p>b) The environmental specialist of PIU shall approve these disposal sites after conducting a joint inspection on the site with the contractor</p> <p>c) Contractor shall ensure that waste shall not be disposed</p>	<p>Solid waste management plan in place with storage areas identified.</p> <p>Agreement for disposal of waste with the Imbupe Pradeshiya Saba in place.</p> <p>Observation on cleanliness at the construction site.</p> <p>All construction solid waste cleared at end of construction.</p>			<p>phase (Weekly)</p>

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
		<p>off near storm water natural drain in the surrounding of the site and along the access path</p> <p>d) Practice cleanliness and good housekeeping practices on site. There should be a demarcated waste storage area on site. Provision of proper drainage facilities to minimize water stagnation around worker-based camps.</p> <p>e) 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. Garbage bins should be provided to all workers-based camps, and construction sites.</p>				

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
Stockpiling of construction materials	Obstruction of drainage	<ul style="list-style-type: none"> -Stockpiling of construction materials will be done in such a way that it does not impact and obstruct the drainage. -Stockpiles will be covered to prevent dust and erosion. 	Observe the stockpile site .	PIU (M) Contractor (I)	Contactor fee	Weekly
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, 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.	<ul style="list-style-type: none"> (a) Wet down and spray water at construction site, quarries if required. (b) Dust emissions during transportation of construction materials should be controlled by enforcing speed limits on the vehicles close to site (c) 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. (d) All filling works are to be protected or covered in a manner to minimize dust generation. 	<p>Observations – controlled dust emissions.</p> <p>Dust screens in place.</p> <p>Construction material stored properly.</p> <p>Review air quality monitoring results.</p> <p>Review of vehicle emission tests according to the standards issues under CEA.</p>	<p>PIU(M) Contractor (I)</p> <p>Air quality monitoring to be carried out by PIU.</p>	Contactor Fee except for air quality monitoring (Project Fee)	<p>Regularly during the construction phase.</p> <p>Air quality monitoring and vehicle emission test to be carried out and reviewed six monthlies.</p>

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
		<p>(e) 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 gazetted under NEA</p> <p>(f) 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</p> <p>(g) The air quality monitoring will be conducted as per the plan.</p>				
Noise pollution	Construction noise can disturb surroundings	(a) All machinery, equipment and vehicles should be maintained in a good condition by engaging skilled mechanics and regularly maintained. National Emission Standards (1994). Noise	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
		<p>control regulations stipulated by the CEA in 1996 (Gazette Extra Ordinance, No 924/12) should strictly be implemented for crushers, construction vehicles and equipment.</p> <p>(b) Contractor must ensure that all vehicles and equipment used in construction shall be fitted with exhaust silencers.</p> <p>(c) Construction work should be limited to daytime.</p> <p>(d) 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.</p> <p>(e) Adhere to noise levels stipulated under NEA. Construction noise level should be maintained at 75</p>				

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
		dB(A) during day time (6:00 a.m. to 9:00 p.m.). (f) Noise level monitoring will be carried out as per monitoring plan.				
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 contractor with the consultation of the PIU. Insurance facilities for the workers in place including indemnity.	Emergency plan for minor accidents and mishaps in place. Worker insurance.	PIU (M) Contractor (I)	Contractor Fee	Meetings on emergency actions to be held once in 6 months.
Occupational Health and Safety	Unless worker safety is complied with, it can lead to injury and other health risks.	(a) Contractor to comply with ADB Environmental, Health, and Safety Guidelines, Labour 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	Review of health and safety plan. First aid available onsite (appropriately equipped). Observations on safety attire of workers. Regular jobsite safety inspections being conducted.	PIU (M) Contractor (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
		<p>plan on Occupational Health and Safety</p> <p>(c) A management strategy and applying practices to eliminate, or minimise, fatalities injuries, and illnesses for workers performing activities and tasks associated with the project.</p> <p>(d) 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.</p> <p>(e) Provide medical insurance coverage and indemnity for workers.</p> <p>(f) The contractor will conform to all anti dengue</p>	Data on available personal protective equipment.			

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
		<p>instructions given to him by the PHI and the PIU.</p> <p>(g) Workers employed on mixing cement, lime mortars, concrete, etc., will be provided with protective footwear and protective goggles.</p> <p>(h) Workers engaged in welding works will be provided with welder's protective eye shields.</p> <p>(i) 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.</p> <p>(j) Use of licensed and trained vehicle operators, workers should adopt necessary safety measures as stated in the contract including</p>				

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
		using of hard hats, boots, gloves and appropriate clothing. (k) First aid provisions available on site and personnel trained on use. (l) Keep the workplace free from hazards. (m) Provide suitable communication and information on safety (n) The construction site will be properly barricaded by appropriate material of adequate height to avoid noise impacts in the surroundings.				
Disaster Management Plan	Life and property damage. Economic cost for the project.	For natural calamities, disaster management plan prepared by the PIU under the provisions of Disaster Management Act. Refer disaster management under “planning”. Coordinate with the disaster management center when preparing such plan	Onsite disaster management plan documented and available with the PIU.	PIU (M) Contactor (I)	Project Cost	Mock drills 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
Clearing of construction camp and restoration	Unless site is cleared it will not be visually pleasing and would lead to health risk.	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, all rubbish removed, excreta or other disposal pits or trenches filled in and effectively sealed off, and the site left clean and tidy, at the contractor's expense, to the entire satisfaction of PIU.	Restoration plan and records of preconstruction of temporary sites	PIU (M) Contractor (I)	Contractor fee	End of construction phase
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 that are native to the area.	Site observation and reporting. Note trees and shrubs planted by the project.	PIU(M) Contractor (I)	Contractor fee	Towards end of construction
OPERATIONAL PHASE						
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	Monitoring results and relevant standards	PIU (I) CEA/ Balangoda Pradeshiya saba (M)	Project operation cost (SUSL)	As per the monitoring plan

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
		approved monitoring authority.				
Drainage Congestions	Stagnation or blocking the water flows may occur due to sediments, improper disposal of debris during maintenance activities or ignorance. This will provide suitable habitats for vectors like mosquitoes etc. In the absence of a proper storm water drainage system there will be a risk of water logged conditions around the site.	(a) University needs to undertake regular maintenance of the drainage system to avoid drainage congestions. (b)	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 the Faculty of Engineering premises. It can also lead to an increase in vector population and increase health risks.	(a) Ensure demarcated solid waste storage area with source separation for organic waste and other domestic non-organic waste. (b) Encourage composting programs	Waste plan in place and implemented. Cleanliness and good housekeeping practices observed. Review solid waste	Blangoda Pradeshiya saba PHI(M) Maintenance engineer at SUSL (I)	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
		(c) Place color coded bins at necessary places to dispose waste. (d) Open dumping halted and proper waste sorting program initiate with the student community. Engage them in the social responsibility. Coordinate with the MOH office.	management plan.			
Domestic liquid waste disposal	Poor maintenance of sanitary facilities and improper disposal of domestic waste water will result in environmental pollution.	a) Properly designed waste water treatment plant is in place. b) 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. c) In instance of overflow, leaks, immediate repairs should be carried. Establish and collaborate with the	Check the design plans for cesspits and soakage pits. Review wastewater treatment plant maintenance. Carry out water quality tests of the treatment plant effluent. Bio Up-flow Anaerobic Floating Filter Technology in	Balangoda Pradeshiya Saba PHI (M) Maintenance engineer at SUSL (I)	Project operational cost (SUSL)	Once in 6 months or when need arises.

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
		Local Authority under such circumstances. d) Install the Bio Up-flow Anaerobic Floating Filter Technology to treat the waste water e) Sludge removal and disposal should be carried out with the guidance of the MOH office.	place for the water treatment			
Sanitary facilities	Discharge of untreated or insufficiently treated sewage, and lack of maintenance of sanitary facilities may lead to: <ul style="list-style-type: none"> • Contamination of drinking water (ground and surface) • Spread of diseases among the student population and surrounding community 	(a) Ensure proper maintenance of the sanitary facilities (flushable and clean) (b) Train maintenance and operation staff to monitor and repair leaks from cracked containment structures, broken pipes, faulty valves and similar structures. (c) Septic tanks will be regularly emptied and maintained. (d) Provide a suitable sump/ overhead tank,	Observation on cleanliness and maintenance of sanitary facilities. Maintenance schedule in place Continuous water supply available in the toilets. The disposed waste water will conform to the waste water discharge	Maintenance Engineer at SJP.	Project operational cost (SJP)	Bi-annually

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
		taking into account the daily requirement of water to ensure uninterrupted water supply for the sanitary faculties. (e) Maintain a required ratio of male/female toilets with in the faculty.	standard stipulated under the NEA			
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 desing should provide space for the fire	First aid kit in place. Switches appropriately placed.	Contractor (I) PIU (M)	SUSL monitoring budget	Annually

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
		extinguishing truck to be accessible from all sides of the building.				
Waste generated on account of operation and maintenance	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 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.	Agreements and plan in place for the disposal of the identified items	SUSL and the suppliers of the renewable energy systems (I)	SUSL operation cost	During the entire operational phase
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: <ul style="list-style-type: none"> • Health checks of the canteen should be done annually 	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
		<ul style="list-style-type: none"> • 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. 				

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.