Draft Initial Environmental Examination

June 2020

Sri Lanka: Health system enhancement project

- Sub-projects proposed for Round 2 Phase I in the Uva Province

Prepared by Project Management Unit (PMU) of Health System Enhancement Project (HSEP), Ministry of Health and Indigenous Medical Services, Colombo, Sri Lanka for the Asian Development Bank.

CURRENCY EQUIVALENTS

(as of 1 June 2020)

Currency unit	–	Sri Lanka Rupee/s (SLR/SLRs)
SLR1.00	=	$0.0054
$1.00	=	SLR186.65

ABBREVIATIONS

ADB	–	Asian Development Bank
CEA	–	Central Environmental Authority
DH	–	district hospital
DS	–	Divisional Secretary
EA	–	executing agency
EHS	–	environment, health & safety
EMP	–	environmental management plan
EMoP	–	environmental monitoring plan
EPL	–	environmental protection license
GN	–	g*rama niladhari*
GoSL	–	Government of Sri Lanka
GRM	–	grievance redress mechanism
H&SP	–	health and safety plan
HCF	–	healthcare facility
HCW	–	health care waste
HCWM	–	health care waste management
HSEP	–	Health System Enhancement Project
IEE	–	initial environmental examination
MOHIMS	–	Ministry of Health and Indigenous Medical Services
NEA	–	National Environmental Act
O&M	–	operation and maintenance
PD	–	project director
PDHS	–	provincial director of health services
PIU	–	project implementation unit
PMCU	–	primary medical care units
PMU	–	project management unit
PPE	–	personal protective equipment
PS	–	*Pradeshiya Sabha*
SKS	–	*saukya karya sahayaka*
SPS	–	Safeguard Policy Statement
SWL	–	scheduled waste license

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Executive Summary

Strengthening primary healthcare (PHC) — both primary medical care and preventive health services — in Sri Lanka needs priority attention to tackle the rising costs of health care as well as to improve primary health services to lagging populations to meet the emerging public health challenges. The current health system under-invests in primary care, and limited government funds mostly cater to higher-level hospitals. The underinvestment at the primary care level has led to inadequate facilities and generally poor utilization of primary care level institutions and increased burden on higher-level health care facilities. As health care is costly, overuse of hospital services creates inefficiency in the use of government health expenditures. The cost pressures arising from increased non-communicable diseases and population ageing, however, have catalyzed the beginning of government reforms to rationalize health care utilization with increased focus and orientation towards PHC. However, the actual reform model is still evolving, and there is a need for external assistance to inform further and help operationalize PHC reform initiatives.

Given this background, the government has begun reforms to rationalize health care utilization with increased focus and orientation towards PHC to meet the emerging challenges in the health sector. The actual reform model is still evolving, and there is a need for external assistance to inform further and help operationalize PHC reform initiatives. To address this, the health sector enhancement project (HSEP), financed by ADB through a concessional loan of $37.5 million from ADB's ordinary capital resources and a $12.5 million grant from ADB's Special Funds resources, was approved on 23 October 2018.

The impact of the proposed investment in the project will lead to improved primary health care management in selected lagging regions for Sri Lanka's health system to adapt to emerging challenges and deal with shifting disease burdens. Some of the key outputs of the project will include (i) development of primary medical care and preventive outreach infrastructure, (ii) improved service support in PHC facilities and increased service utilization (iii) enhanced capacity of preventive health care institutions for better public health and disease surveillance and (iv) policy reforms to facilitate PHC development.

In compliance with the ADB Safeguard Policy Framework, the sub-projects involving civil works included in the HSEP have been classified as environmental assessment Category B, which requires to conduct an Initial Environmental Examination (IEE). This report covers the physical interventions proposed by the HSEP is carried out as a requirement of the Safeguard Policy Framework of the ADB as outlined in the EARF prepared for the HSEP. This IEE covers the sub-project areas of 10 health care facilities in the Uva Province proposed under Round 2 Phase 1 of the HSEP, which include 5 HCFs in Badulla District (Metigahatenna DHB, Uva Paranagama DHB, Lunugala DHB, Carklees DHC and Haputale DHB) and 5 HCFs in Monaragala District (Kotagama PMCU, Pitakumbura DHC, Medagama DHB, Rathmalgaha Ella PMCU, and Nannapurawa PMCU) and its civil works components included in the design, construction-, and operational-phases.

Civil works proposed for each of these ten sub-projects will be focused mainly on expanding facilities within the Out-Patient's Department (OPD) in Primary Medical Care Units (PMCUs) and Divisional Hospitals, typically adding between 1,000 to 2,000 sq. feet to the existing building footprint within the same premises depending on the institution's requirements. Upgrades to OPDs will typically include new consultation rooms, dressing rooms, and expanding patient waiting areas, addition/renovation of emergency treatment units (ETU), laboratories, dispensary, drug stores, staff restrooms and toilets. Some work could also include minor renovations such as tiling of floors and walls, electrical re-wiring, and lighting, plumbing and repair to toilets and septic systems, fixing ceilings and roofing, new furniture, lighting, fixtures, and other fittings.

The field visits conducted observed that the proposed sites for the establishment of the new facilities are located within existing HCF premises. None of the sites are located within or

adjacent to areas that are ecologically or environmentally sensitive. The proposed plots either bare land (Haputale, Carklees, Pitakumbura, Rathmalgaha Ella, Kotagama and Nannapurawa) or lands which are available after the demolition of old buildings or parts of buildings (Lunugala, Metigahatenna, part of Uva Paranagama sub-project) located within the boundaries of existing hospital premises or located at the backyards of the premises. At two locations, renovations are proposed to old buildings (Medagama and part of Uva Paranagama sub-project). The five sites in Monaragala District are flat; however, peripheral areas of the site at Pitakumbura has mild slopes. The sites in Badulla District have sloping terrain, other than the sub-project location at Uva Paranagama.

It is evident that most of the environmental issues during the construction phase is related to localized and temporary impacts such as (i) elevated levels of dust, noise, vibration, (ii) pollution due to solid waste disposal including potentially hazardous components such as discarded construction material, construction wastewater and operation of labour camps, (iii) onsite drainage impairment, (iv) soil erosion and potential for alteration of surface drainage patterns, and (v) risk of occupational health and safety for construction workers. All these impacts can be minimized and mitigated with the adequate implementation of the provisions given in the EMP. Moreover, the period of construction is also not long due to the simple nature of the construction.

As documented in this IEE Report, the current practices of hazardous health care waste management in the hospitals are inadequate and unhygienic. While a reasonable attempt is made at segregating waste according to the category at the point of generation, the segregation is not maintained throughout. Finally, the waste is openly burnt at all the sites that were visited. With the increased collection of clinical and infectious waste once the new facilities are established, such inappropriate waste management at HCFs are bound to increase raising the risks for public health and the environment.

Findings of the IEE confirm that the positive impacts of the project far outweigh any negative impacts arising out of establishing new facilities at the ten HCFs. None of the environmental impacts identified is irreversible and widespread; instead, they are localized, temporary in nature and short term. With proper site management and safety practices, these impacts can be effectively managed. Stakeholder consultations have revealed that the demand for the better and increased quality of healthcare services are urgently needed in the country. As such, the project will be a positive step towards providing better health services to the country as well as prepare the country to face emerging health sector challenges successfully in the coming decades.

Among the recommendations, completion of the construction work at the shortest possible time would minimize most of the impacts that will affect the hospital users will be stressed. Health care waste management be given priority and proper strategies to be developed and implemented to manage the issue as well as to build capacity and awareness within hospital staff for HCWM. Also, a proper sewer disposal system by installing suitable on-site wastewater treatment systems (e.g., septic tank and suitable soakage arrangement) are needed. In addition, the improved facilities should be supplied with a dedicated electricity connection, water supplies and telecommunication facilities by the HCFs. Additional water storage will also be needed. In conclusion, implementation of the EMP and the EMoP is essential to make sure that any environmental impacts are effectively mitigated.

I. INTRODUCTION

A. Project Background - Overview

1. Sri Lanka's health system today is facing challenges to sustain its performance due to rapidly changing demographics and epidemiological transitions. The cost of health care is increasing due to the sharp rise in non-communicable diseases linked to lifestyles and rapidly ageing population. The national health system needs to improve further to expand services to vulnerable populations with lagging health indicators. Besides, there is an increased threat of emerging and resurging infectious diseases linked to environmental factors and increased cross-border migration. The status quo of the health system is inadequately prepared to deal with these evolving challenges without significant reorientation and further improvements. The Asian Development Bank (ADB) is proposing to finance the enhancement of the Sri Lanka health system to adapt to emerging challenges and deal with shifting disease burdens.

2. Strengthening primary healthcare (PHC) — both primary medical care and preventive health services — in Sri Lanka needs priority attention to tackle the rising costs of health care as well as to improve primary health services to lagging populations to meet the emerging public health challenges. The current health system under-invests in primary care, and limited government funds mainly cater to higher-level hospitals. The underinvestment at the primary care level has led to inadequate facilities and generally poor utilization of primary care level institutions and increased burden on higher-level health care facilities. As health care is costly, overuse of hospital services creates inefficiency in the use of government health expenditures.

3. The cost pressures arising from increased non-communicable diseases and population ageing, however, have catalyzed the beginning of government reforms to rationalize health care utilization with increased focus and orientation towards PHC. However, the actual reform model is still evolving, and there is a need for external assistance to inform further and help operationalize PHC reform initiatives.

4. Given this background, the government has begun reforms to rationalize health care utilization with increased focus and orientation towards PHC to meet the emerging challenges in the health sector. The actual reform model is still evolving, and there is a need for external assistance to inform further and help operationalize PHC reform initiatives. To address this, the health sector enhancement project (HSEP), financed by ADB through a concessional loan of $37.5 million from ADB's ordinary capital resources and a $12.5 million grant from ADB's Special Funds resources, was approved on 23 October 2018. The loan and grant became effective on 5 February 2018 and are to be closed on 31 May 2024.

5. The Government of Sri Lanka (GoSL) identifying the need of facing the challenges in sustaining the country's health system performance due to rapidly changing demographics and epidemiological transitions, had requested this assistance from the ADB. HSEP will support some of the reforms by renovating and expanding physical infrastructure in about 30% (135) of the primary medical care facilities (especially for better outpatient's care), equipping for a better point of care services and introducing more efficient disease surveillance and patient information management. Selection of facilities for improvement under the project has been based on several agreed vulnerability criteria and mapping. The investment is aligned with the government's priorities identified in the Public Investment Program (2017–2020), as well as with the Health Master Plan's National Strategic Framework for Development of Health Services (2016–2025). The project is also in line with the ADB Sri Lanka Country Partnership Strategy (2018–2022) and reinforces ADB's inclusive growth agenda in the midterm review of strategy 2020.

6. The Ministry of Health and Indigenous Medical Services (MOHIMS) is the project's executing agency (EA). The project management unit (PMU) established in the MOHIMS, and project implementing units (PIUs) established in each project supported province are responsible for project implementation (including project supervision, coordination and undertaking procurement of civil works).

7. This document presents the Initial Environmental Examination (IEE) prepared by the Environmental Specialist, HSEP, in consultation with the PMU and on behalf of the Ministry of Health and Indigenous Medical Services (MOHIMS) and covers the sub-projects in the Uva Province proposed under Round 2 Phase 1 of the HSEP, which include five HCFs in Badulla District and five HCFs in Monaragala District and its civil works components. More details of each sub-project are given in the forthcoming sections. The scope of work proposed for the project is included in Chapter III.

8. The IEE complies with project's EARF, which outlines the environmental safeguard requirements of the project as per the ADB Safeguard Policy Statement (2009) and the national environmental laws and regulations.

B. Scope and Objectives of the HSEP

B.1 Program impacts and outcomes

9. The impact of the proposed investment in the project will lead to improved primary health care management in selected lagging regions for Sri Lanka's health system to adapt to emerging challenges and deal with shifting disease burdens. Some of the key outputs of the project will include (i) development of primary medical care and preventive outreach infrastructure, (ii) improved service support in PHC facilities and increased service utilization (iii) enhanced capacity of preventive health care institutions for better public health and disease surveillance and (iv) policy reforms to facilitate PHC development.

B.2 Program Locations

10. The program will be implemented in four lagging provinces in the country through the Ministry of Health, Nutrition, and Indigenous Medicine (MOHNIM) and Directorates of Health Services at the provincial and district levels. The provinces are Central, North Central, Sabaragamuwa, and Uva, and include nine districts in all. The program will focus on improving service delivery in the most vulnerable areas. Therefore, the Health Sector Enhancement Project (HSEP) implementation will be rolled out in areas prioritized according to a vulnerability index that has been developed using selected criteria.[1]

B.3 Scope of Civil Work

11. Civil works under the program will be focused mainly on expanding facilities within the Out-Patient's Department (OPD) in Primary Medical Care Units (PMCUs) and Divisional Hospitals, typically adding between 1,000 to 2,000 sq. feet to the existing building footprint within the same premises depending on the institution's requirements. Upgrades to OPDs will typically include new consultation rooms, dressing rooms, and expanding patient waiting areas, addition/renovation of emergency treatment units (ETU), laboratories, dispensary, drug stores, staff restrooms and toilets. Some work could also include minor renovations such as tiling of floors and walls, electrical re-wiring, and lighting, plumbing and repair to toilets and septic systems, fixing ceilings and roofing, new furniture, lighting, fixtures, and other fittings.

B.4 Project Components

12. The proposed solutions will further enhance Sri Lanka's health system through support for strengthened primary health care and improved health and disease surveillance capacity. ADB's assistance is expected to (i) further inform and operationalize government PHC reform initiatives, while improving underserved communities' access to essential health services, and (ii) address selected gaps in core public health capacities in line with the international health regulations (2005).

13. This project output intends to strengthen the PHC services in the target provinces of

[1] (i) percentage of the places with basic facilities more than 5 kilometers from the *Grama Niladhari* division; (ii) percentage of households which used kerosene and other sources of non-electricity for lighting; (iii) percentage of low quality households; (iv) percentage of households using unprotected water sources; and (v) percentage of houses with low quality sanitation facilities.

Central, North Central, Sabaragamuwa, and Uva, with a particular focus on the socially, economically, and geographically disadvantaged populations. The PHC services are defined as primary health care services that are provided via curative level facilities (PMCUs) and the Divisional Hospitals, and via the preventive health network of Medical Officer of Health areas led by the Medical Officers of Health). Approximately 469 PMCUs and Divisional Hospitals and 132 Medical Officer of Health areas are in the target provinces.

Output 1: PHC enhanced in Central, North Central, Sabaragamuwa, and Uva Provinces

14. Output 1 of the project intends to address the following aspects of PHC services defined into four sub-outputs:

(i) Development of primary medical care services

(ii) Development of primary preventive care services

(iii) Public awareness and behaviour change communication for increasing PHC utilization and creating demand; and

(iv) Strengthen PHC management for continuity of care.

Output 2: Health information and disease surveillance capacity strengthened

15. Output 2 of the project intends to address the following two sub-outputs:

(i) Adopt health Information technology (HIT) for better continuity of care and disease surveillance; and

(ii) Implement International Health Regulations recommendations.

Output 3: Policy development, capacity building, and project management support

16. Output 3 of the project intends to support the following tasks described in the three sub- outputs.

(i) Policy development support

(ii) Capacity development; and

(iii) Project management and results monitoring.

C. Objectives of the Initial Environmental Examination (IEE) Report

17. The Environmental Assessment for physical interventions proposed by the HSEP is carried out as a requirement of the Safeguard Policy Framework of the ADB[2] as outlined in the EARF prepared for the HSEP[3]. The scope of this IEE, which cover the ten sub-projects in the Uva Province proposed under Round 2 Phase 1 of the HSEP, is described below:

- Field data collection of baseline information regarding the physical, social, economic, and environmental background of the project areas (10 health care facilities in the Uva Province, which include 5 locations in Badulla District and 5 locations in Monaragala District).
- Consultations with different stakeholders and other relevant authorities.
- Gather information related to interventions of each sub-project
- Preparation of the Environmental Screening Checklist (Scoping Checklist) for No Mitigation Scenario
- Assessment of potential environmental impacts and development of preventive and/or mitigation measures for significant impacts with attention on providing guidelines for handling hazardous waste.

[2] Safeguard Policy Statement, Asian Development Bank, June 2009.

[3] Environmental Assessment and Review Framework (EARF) for Sri Lanka: Health System Enhancement Project (HSEP) (July 2018)

- Preparation of Environmental Management Plan (EMP) and Environmental Monitoring Plans (EMoP). These can be used as a template for all the ten sub-projects with guidance on site-specific issues to be included in the individual bidding documents, including costs of mitigation and institutional responsibilities.
- Preparation of institutional requirements and Grievance Redress Mechanism (GRM).
- Preparation of consolidated Initial Environment Examination (IEE) report.

18. This IEE report provides general policies, guidelines, and procedures to be integrated into the implementation of all components under the HSEP. In preparing this document, the following procedure has been adopted:

- Safeguard Policy Framework of the ADB[1] and the EARF[2] have been reviewed to identify environmental safeguard requirements and Policy of the ADB
- The Environmental assessment processes as outlined in the OM Section F1/OP (2013)[4] and the ADB's Environmental Safeguard Policy Statement (ADB SPS, 2009) and Environmental Assessment Guidelines[5], and Environmental Safeguards - Good Practice Sourcebook[6] have been reviewed to determine the environmental category of the proposed project. The procedure to be adopted for conducting Environmental Assessments. The Environmental Screening Checklist for Health Care Facilities (as proposed in the EARF) has been filled.
- Relevant environmental regulations, guidelines, policies of Sri Lanka are reviewed.
- The review also includes consultations with the associated technical personnel to identify the components of the proposed project activities.
- The assessment has made an effort in identifying potential environmental impacts and proposed strategies to mitigate the potential adverse environmental impacts due to project activities

19. The assessment outlines environmental screening procedures, assessment methodologies, environmental management (mitigation, monitoring, and documentation), and reporting for actions proposed under the Project, and to specify institutional structure and mechanism to carry out compliance to the environmental management plan.

20. To meet the requirements of ADB, the IEE report generally follows the ADB Safeguard Policy Statement (2009) and Environmental Safeguards - Good Practice Sourcebook. The structure of the IEE report is organized as follows as provided in the EARF:

- *Introduction:* Provides identification of the sub-projects and the sub-project components, and an explanation of the Objectives of the proposed project and the sub-projects. It also presents the Approach and the Methodology adopted by the IEE
- *Policy, Legal, and Administrative Framework:* This section summarizes the national and local legal and institutional framework within which the environmental assessment is carried out. It also identifies project-relevant international environmental agreements to which the country is a party. This chapter includes: Applicable Laws, Regulations, Standards and Requirements, ADB Policy on Environmental & Social safeguards
- *Description of Sub-Project:* In accordance with the ADB Safeguard Policy Statement (SPS 2009) and Environmental Assessment Guidelines (2003), this section provides the detailed description of the sub-projects, need of sub-projects,

[4] Operations Manual Bank Policies (BP), Asian Development Bank, 2013
[5] Environmental Assessment Guidelines, Asian Development Bank, 2003
[6] Environment Safeguards - A Good Practice Sourcebook; Draft Working Document, ADB, December 2012

sub-project locations, and magnitude of the operations, the environmental category of the overall project and implementation schedule of sub-projects.

- *Description of the Environment:* Describes the current environment of the sub-project areas. The summaries are based on available documentation, statistical data, and meetings with government authorities, stakeholders, field surveys, and investigations.
- *Screening of the Potential Environmental Impacts and Mitigation Measures*: Provides an assessment of potential impacts of the proposed sub-project and its components in light of the existing conditions together with recommended actions to prevent and/or otherwise to mitigate unavoidable impacts.
- *Information Disclosure, Consultation, and Participation:* Information on public participatory workshops and consultations with experts and local administrative officers are presented in this section.
- *Grievance Redress Mechanism (GRM):* This section describes the grievance redress framework (both informal and formal channels), setting out the time frame and mechanisms for resolving complaints about environmental performance. (A Grievance Redress mechanism is already in place under the HSEP Round 1 sub-projects that are being implemented in the Uva Province as suggested by the Environmental Assessment and Review Framework EARF).
- *Environmental Management Plan and Environmental Monitoring Plan, Implementation, and Institutional Requirements:* This section deals with the set of mitigation and management measures to be taken during sub-project implementation to avoid, reduce, mitigate, or compensate for adverse environmental impacts. It also includes management plans and actions. Provides a description of responsible parties to implement, administration, and supervision of each sub-project and the procedure to address concerns, complaints, and grievances of the affected population.
- *Conclusion and Recommendations:* Findings of the IEE study and recommendations which are finalized by the consultant are stated here with the analysis of currently available data. Conclusions section outlines the outcome of the IEE and justifies the implementation of sub-projects.

D. Environmental Category

21. In compliance with the ADB Safeguard Policy Framework, the sub-projects included in the HSEP have been classified as environmental assessment Category B (some negative impacts but less significant than category A).

22. By comparing the similar nature of sub-projects, the activities proposed under HSEP were therefore reviewed following the provisions of the Environmental Review and Assessment Framework (EARF) prepared for the HSEP. A no-mitigation environmental screening using ADB's Environmental Screening Checklist for Health Care Facilities (Annex 1) was conducted, and the results of the assessment showed that all the sub-project are unlikely to cause significant adverse impacts. Thus, this initial environmental examination (IEE) has been prepared in accordance with ADB SPS's requirements for environment category B projects.

23. This IEE covers the sub-project areas of 10 health care facilities in the Uva Province proposed under Round 2 Phase 1 of the HSEP, which include 5 HCFs in Badulla District (Metigahatenna DHB, Uva Paranagama DHB, Lunugala DHB, Carklees DHC and Haputale DHB) and 5 HCFs in Monaragala District (Kotagama PMCU, Pitakumbura DHC, Medagama DHB, Rathmalgaha Ella PMCU, and Nannapurawa PMCU) and its civil works components included in the design-, construction-, and operational-phases.

II. POLICY, LEGAL, AND ADMINISTRATIVE FRAMEWORK

A. Applicable Laws, Regulations, Standards, and Requirements

A1. National Environmental Act and other applicable regulation

1. Environmental Protection and Management

24. The commitment and responsibility of the government and citizens to environmental protection is enshrined in the constitution (GoSL, 1978[7]). Chapter VI (Directive Principles of State Policy and Fundamental Duties), Sections 27 (14) and 28 (f) declares that: "The State shall protect, preserve and improve the environment for the benefit of the community" and "it is the duty of every person in Sri Lanka to protect nature and conserve its riches".

25. The underlying legislation governing protection and management of the environment is the National Environmental Act, (NEA) No. 47 of 1980, and its subsequent amendments, No 56 of 1988 and No 53 of 2000. The NEA includes main regulatory provisions through which the environmental impacts of development are assessed, mitigated, and managed:

(i) The Environmental Impact Assessment (EIA) procedure for major development projects - regulations published in Government Gazette Extraordinary No 772/72 of 24 June 1993 and in subsequent amendments

(ii) The Environmental Protection License (EPL) procedure for control of pollution - regulations published in Gazette Extraordinary No 1533/16 of 25 January 2008.

(iii) Scheduled Waste License (SWL) procedure for the management and control of hazardous waste disposal - regulations published in Gazette Extraordinary No 1534/18 of 01 February 2008

(iv) Other regulations related to pollution control enacted under the NEA

26. Apart from the regulatory provisions of the NEA, there are Other relevant legislation and o regulatory provisions for pollution control, environmental perseverance, and protection, which are enacted by State-sector entities.

2. Environmental Impact Assessment

27. The GoSL recognizes EIA as a useful tool to integrate environmental considerations with development planning. The application of this technique is considered as a means of ensuring that likely effects of development projects on the environment are fully understood and considered at an early stage of the project and throughout the project cycle.

28. The provision for EIA is contained in Part IV C of the NEA, which requires the submission of an IEE or EIA report in respect of specific prescribed projects. These are specified in Gazette Extraordinary No 772/22 of 24 June 1993 and include the following:

(i) For Prescribed Projects as defined in NEA (1980, 1988, 1993, 2000): PART I: 31 Projects and Undertakings if located wholly or partly outside the coastal zone (Infrastructure + Large Scale Development Projects); PART II: Projects in PART I and 20 Industries; PART III: if located wholly or partly within an Environmental Sensitive Area (Note: none of the components of the proposed project falls under any of these categories)

(ii) Projects that fall within sensitive areas as defined in the National Environmental (Procedure for approval of projects) Regulations, No.1 of 1993.

[7] Government of Sri Lanka (1978, as amended): The Constitution of the Democratic Socialist Republic of Sri Lanka (Revised Edition 2015), 221 pp. (http://www.parliament.lk/files/pdf/constitution.pdf)

3. Environmental Protection License (EPL) and Disposal of Scheduled Waste

29. The Environmental Protection License (EPL) scheme was introduced under the NEA to prevent or minimize the release of discharges and emissions from industrial activities in compliance with national discharge and emission standards; guide industry on methods of pollution control; and encourage the use of new pollution abatement technologies, such as cleaner production, waste minimization, etc.

30. In Gazette Extraordinary 1533/16 of 25 January 2008, industries are classified into three categories (A, B or C) depending on their pollution potential. Licenses may also be required for some activities conducted on-site during the construction period, such activities are classified as Part A, B or Part C, depending on their capacity or output. Part A of The Schedule of the Order under Section 23A includes 'Item 68: *Health care service centres generating infectious wastes, including medical laboratories and research centres'* as a prescribed activity for which a license is required. Further, Part B of the same Order includes "Item 26: Municipal solid waste and other solid waste composting plants (excluding household composting) having a capacity of less than ten metric tons per day", and "Item 27: Solid waste recovery/recycling or processing plants having a capacity of less than metric tons per day", as a prescribed activity for which a license is required.

31. As stipulated through National Environmental (Protection & Quality) Regulations, No. 1 of 2008 (Gazette Notification No. 1534/18 dated 01.02.2008), which deals with waste from specific and nonspecific sources, any effluent discharges and waste discharges (scheduled waste) should conform to the Standards. The Regulations has three parts and eight schedules of which Part I deals with the issue of environmental protection license (EPL) for emission/disposal of waste, and Part II deals with the issue of license for the management of scheduled waste (Hazardous Waste) and part III on general matters including definitions and the effectiveness and validity of the license issued under National Environment (Protection and Quality) Regulation, No. 1 of 1990 published in Extraordinary Gazette No. 595/16 of February 1990. The eight schedules include the tolerance limits, applications, formats for reporting, categorization of non-specific and specific waste etc.

32. The National Environmental (Protection & Quality) Regulations, No. 1 of 2008 define the prescribed activities for which a license is required and procedures for obtaining one. Part II of the Regulations on the Issue of License for the Management of Waste states that: "*No person shall generate, collect, transport, store, recover, recycle or dispose waste or establish any site or facility for the disposal of any waste specified in the Schedule VIII except under the authority of a license issued by the Authority and in accordance with standards and other criteria as may be specified by the Authority*".

33. Since 2008, after the Regulations mentioned above were enacted, the NEA requires all medical institutions to obtain a valid Environmental Protection License (EPL) for (i) generation, (ii) collection, (iii) transportation, (iv) storage, (v) recovery, (vi) recycling, and (vii) disposal of scheduled waste. Scheduled waste as applicable to the proposed sub-projects under the HSEP are as follows which are included in the Schedule VIII of The National Environmental (Protection & Quality) Regulations, No. 1 of 2008:

<u>Part I: Scheduled wastes from non-specific sources</u>

- Item 26: Pathogenic and clinical wastes and quarantined material

  N261: Pathogenic and clinical wastes and quarantined material
- Item 27: Containers and bags containing hazardous residues and material

  N271: Used containers or bags contaminated with scheduled wastes and residues
- Item 28: Mixtures of scheduled wastes

  N281: A mixture of scheduled wastes

N282: A mixture of scheduled and non-scheduled wastes

Part II: Scheduled wastes from specific sources

- Item 16: Asbestos waste

  S164: Waste arising from repairing/renovation processes and demolition/construction debris containing asbestos

- Item 28: Biomedical and health care waste from general health care institutions including medical laboratories and research centres

  S281: Infectious health care waste including laboratory cultures; waste from isolation wards; tissues (swabs), materials or equipment that have been in contact with infected patients; human tissues or fluids

  S282: Sharps including needles and scalpels

  S283: Biological and anatomical waste including tissues, organs, body parts, human fetuses and animal carcasses, blood, and body fluids

  S284: Outdated and discarded drugs including cytotoxic drugs and chemical reagents

  S285: Material and containers contaminated with the above-specified waste

34. Accordingly, every HCF is legally responsible for the proper management of health care waste from the point of generation until its final disposal to ensure minimum environmental and public health impacts. However, the NEA does not contain any definition of HCW, or characterization of the type and degree of hazards associated with different medical wastes. Nor does it carry any guidance on treatment and disposal technologies that might be considered acceptable in Sri Lankan. Applicability of NEA to subprojects is as follows:

1. The civil works envisaged under the subproject do not fall within prescribed categories of the NEA for environmental impact assessment, and as such, IEE/EIA is not required. However, discharge of scheduled waste (solid and wastewater) during operation falls within the prescribed category for pollution control, and as such, is required to obtain an EPL and scheduled waste license (SWL).
2. Environmental standards on effluent quality, air quality, noise and vibration will apply to the subproject where the contractor and the HCF are obligated to comply with stipulated levels during construction and operational levels.

5. Existing health care waste management framework in the country

(a). Draft National Policy on health care waste management

35. In 2001, the Government of Sri Lanka drafted a comprehensive national policy on health care waste management (HCWM). It has three main sections covering:

(i) General considerations on HCWM and the institutional mechanism for policy implementation that should be set up at national level.

(ii) Provisions for the safe management of health care waste (HCW) in medical Institutions, including regulations and HCWM plans.

(iii) Provisions for the implementation of and the monitoring of HCWM plans at national and provincial levels including legislation, provision of human and financial resources, training and awareness and participation of the private sector.[8]

[8] Government of Sri Lanka, Ministry of Health. 201. *Draft National Policy on Health Care Waste Management.* Colombo.

36. Some salient features of the draft policy are highlighted below.

(i) Healthcare waste generated by the medical institutions of the public and private sector must be safely handled and disposed of. HCWM as an integral part of hospital hygiene and infection control, hence each healthcare facility (HCF) is legally responsible for the proper management of waste that it generates until its final disposal.

(ii) Major hospitals must prepare specific HCWM plans outlining needs, objectives, and strategies, procedures for approved management and disposal of HCW and timeframe for implementation. The PDHS must set up annual Provincial, and District HCWM plans to present the strategy for HCWM that should be developed at the regional level. The provincial/regional plan shall be a compilation of individual HCWM plans of each HCF the province is responsible for. All plans need to be validated and supported by the Central or Provincial Health Services before implementation.

(iii) Specific budget lines need to be developed relating to hospital hygiene and HCW management in the National Accountancy of the Health System to ensure sufficient human and financial resources are allocated to implement the HCWM plans in medical institutions.

(iv) Policy implementation needs to be monitored based on specific objectives defined in the National Action Plan (the plan developed to implement the policy countrywide - see the section below) and that institutionally, the National Steering Committee on Clinical Waste Management is responsible for the overall monitoring and evaluation and the PDHS for the implementation of monitoring procedures in HCFs within their area of jurisdiction.

(v) Other key aspects highlighted relate to approved HCWM practices, equipment for treatment and disposal, training and awareness, the involvement of civil society and private sector participation

37. The institutional mechanism for implementing the national policy was envisaged under three levels of management:

(i) At the central level, coordination and development of strategies and mechanisms to implement policy commitments, per national requirements, has been vested with the National Committee on Clinical Waste Management (NCCWM). Besides, development of training and capacity building packages, training implementation supervision, setting up of HCW monitoring protocols, overall monitoring and evaluation has been assigned to the NCCWM. The central health services are responsible for technically backstopping HCFs under its management purview.

(ii) At the provincial level, implementation of the policy has been vested with the Provincial Councils. The PDHS is responsible for setting up provincial HCWM plans, synthesized from individual hospital HCWM plans coming under its area of jurisdiction, development of financial resources and for the implementation of HCW monitoring/auditing procedures.

(iii) At the local level, setting up of HCWM plans that outline needs, objectives, strategies, procedures, and timeframes for medical institutions has been vested with the hospital management.

38. The national policy on HCWM to this date remains a draft as all attempts for its formal adoption in the past has not been successful.

(b). National Guidelines on health care waste management

39. In 2001, the government drafted national guidelines for healthcare waste management

with the aim of (i) providing a better understanding of the fundamentals of HCWM planning and (ii) directing HCFs in setting necessary procedures and standards to comply with policy and legislative requirements. These have been drafted in a form that provides all fundamental elements that should be integrated into future legislation specific to HCW. Although guidelines were reviewed by the national committee on clinical waste management (NCCWM) as well as the Ministry of Health, it did not receive formal endorsement by the government.

40. The draft national guidelines contain both practical and conceptual information on HCWM covering four main sections:

(i) Definition and categorization of HCW, including potential harmful effects that can result from its improper management.

(ii) Procedures for segregation, packaging, labelling, collection, storage, transportation, and disposal (including the selection of appropriate treatment and disposal technologies for HCW) that should be applied and followed by all HCFs in the country.

(iii) Instructions for the implementation of health care waste management plans, including detail description of duties and responsibilities of health care provider at various levels.

(iv) Instruction for personnel of Central and Provincial Health Services who oversee HCWM to ensure smooth implementation of the guidelines and to set up regular monitoring mechanisms.

41. In 2007, concise guidelines for HCWM were prepared under the Hospital Efficiency and Quality component of the Sri Lanka Health Sector Development Project based on the detailed draft guidelines prepared in 2001. The concise guidelines which mainly contain sections in waste categorization and health care waste management procedures have been formally adopted and incorporated into the Handbook of Infection Control.

(c). Code of Hygiene

42. Management of HCW is an integral part of hospital hygiene and infection control that must be reinforced with internal rules. In 2008, the government developed a comprehensive Code of Hygiene that completed the existing Infection Control Handbook. The national code of hygiene contains recommended HCWM procedures and is seen as part of an overall set of actions to control the hygiene conditions within the hospital. It sets out duties and responsibilities of medical and non-medical staff regarding hygiene procedures to be applied, recommended practices to maintain a high level of hygiene and ongoing management and managerial activities to be carried out in the hospital. The code of practice must be implemented along with the HCWM guidelines.

43. **National Color code.** In 2006, the MOH developed a national colour code for implementing a uniform system for separating HCW streams based on the type of waste, treatment, and disposal methods. The code recommends technical specifications for bags and bins to be used for different waste types. The national colour code identifies seven specific categories.

Table 1.1: National Color Code for segregation of HCW

Colour	Category	Contents
Yellow	Infectious	Cultures or stocks from microbiology, tissues from surgeries/autopsies, material, or equipment in contact with blood or body fluids soiled linen, dialysis equipment such as tubing and filters.
Yellow with red stripes	Sharp waste	Sharps, needles and IV sets contaminated with body fluids
Black	General waste	General or municipal waste that is uncontaminated

Green	Biodegradable waste	Garden, kitchen, and food waste
Red	Glass waste	Uncontaminated drink bottles, water bottles
Blue	Paper waste	Paper, cardboard, and office stationery
Orange	Plastic waste	Uncontaminated plastic medicine bottles, saline bottles without IV sets, plastic bags

6. Archaeological Impact Assessment

44. The Antiquities (Amendment) Act, No. 24 of 1998, and implementing regulations published in Gazette Extraordinary No. 1152/14 of 04.10.2000 require that an Archaeological Impact Assessment be conducted about every proposed development project with a land area of over 0.25 ha. The purpose of the assessment is to examine whether there are antiquities in the land, to determine the impact of development and to provide alternative measures if needed.

45. The Government's Department of Archaeology (DOA) specifies the projects for which their written permission should be obtained before implementation, and these include Ancient constructions of historical and archaeological value which are older than 100 years will be declared as archaeological monuments following the legal provisions of the Antiquities (Amendment) Act No. 24 of 1998.

46. Ancient monuments situated on state lands and ancient trees growing in state land or any other land will be declared as an ancient monument in terms of Sections 16 and 17 of the Antiquities Ordinance No. 09 of 1940 to secure the preservations or protection of them. Section 21 emphasizes that proper authority and intervention of Department of Archaeology is essential to commence or carry out any work of restoration, repair, or addition in connection with any protected monument after they are being declared in the above manner.

7. Labour Laws and Occupational Health and Safety

47. Sri Lankan legislation includes some laws, acts, and regulations designed to prevent the exploitation of workers and to protect their health and safety in the workplace (construction sites and operating facilities). These instruments are identified in the tender documents, and the contractor will be required to comply with all those listed and any others that may be applicable. It is not possible to review this legislation here, so the following sources are recommended for further information: Department of Labour[9]; Salary.lk[10]; National Institute of Occupational Safety and Health[11]; and for an international perspective, the World Bank's guidelines on Occupational and Community Health and Safety[12].

48. The Contractor must comply with requirements for the safety of the workmen as per:

- Safety and Health Regulations of the Factories Ordinance Act, No. 45 of 1942[13]. This Ordinance, Chapter 128 of the Legislative Enactments of Sri Lanka, is an Act that makes provision for safety, health, and welfare of workers in workplaces. Factories (Amendment) Act No.33 of 2000, which extends the coverage of the Ordinance to include the construction industry.

[9] http://www.labourdept.gov.lk/index.php?option=com_content&id=65&Itemid=59&lang=en&limitstart=1

[10] http://www.salary.lk/home/labour-law

[11] http://www.niosh.gov.lk/

[12] http://www.ifc.org/wps/wcm/connect/9aef2880488559a983acd36a6515bb18/2%2BOccupational%2BHealth%2Band%2BSafety.pdf?MOD=AJPERES

[13] http://srilankalaw.lk/Volume-III/factories-ordinance.html

- The International Labor Organization (ILO) - Convention No. C062 - Safety Provisions (Building) Convention[14], which is the Convention concerning Safety Provisions in the Building Industry
- International Finance Corporation's (IFC) and the World Bank Group's Environmental, Health & Safety (EHS) Guidelines on Occupational Health and Safety (2007)[17]. The following sections are relevant to the present project:
    - Section 2.0: Occupational Health and Safety
    - Section 3.0: Community Health and Safety
    - Section 4.0: Construction and Decommissioning
    - The workers' camps should be provided with appropriate facilities and maintained properly to ensure safe and sanitary conditions conducive to healthy stay while they stay. Apart from the provisions of the International Finance Corporation's (IFC) and the World Bank Group's Environmental, Health & Safety (EHS) Guidelines on Occupational Health and Safety (2007) related to proper conditions to be provided at such workers' camps, and international best practice has to be observed. The Contractor is obliged to follow such best practice. Occupational Safety and Health Administration (OSHA) of the US Department of Labor has compiled Standards (Standard 1910.142) on temporary labour camps[15]

49. The contractor is expected to prepare a site-specific EMP (SEMP), in which clear statements should be included as to how IFC's EHS Guidelines are met. Contractor's practices in implementing EHS in on-going projects should be highlighted. Also, the following frameworks are applicable, which are directly related to the health and safety of workers:

- Occupational Health and Safety – IFC's Environmental, Health, and Safety Guidelines for Health Care Facilities[16]
- National Environmental (Noise Control) Regulations No.1 1996 and the Interim Standard on Vibration Pollution Control for Sri Lanka (2001)

8. Other regulations related to pollution control enacted under the provisions of the NEA

50. Other than the provisions of the NEA, the following are also applicable for the proposed project.

Table 1.2: Other provisions of the NEA which are applicable for the proposed project

Laws and Regulations	Provisions and Main Content	Applicability to the project
National Environment (Noise Control) Regulations 1996. Gazette Notification Number 924/12 dated 23rd May 1996. National Environmental (Vehicle Horns) Regulations, No. 1 of 2011	Regulates maximum allowable noise levels for construction activities during subproject activities	Noise levels should be strictly monitored for conformity, especially during excavations and backfilling.
National Environment (Ambient Air Quality) Regulation 1994 and Amendment of Gazette Notification Number 1562/22 dated 15th August 2008.	Establishes permissible ambient air quality standards during proposed project activities	Ambient air quality should be established before construction and be monitored during construction, especially activities involving earthwork.

[14] https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_CODE:C062#A1
[15] https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.142
[16] https://www.ifc.org/wps/wcm/connect/960ef524-1fa5-4696-8db3-82c60edf5367/Final%2B-%2BHealth%2BCare%2BFacilities.pdf?MOD=AJPERES&CVID=jqeCW2Q&id=1323161961169

9. Other relevant legislation for pollution control, environmental perseverance, and protection

51. The present Constitution of Sri Lanka came into operation in 1978 and also provided the basic principles of environmental protection and preservation through Chapter 4, Section 27, and Item 14; "*The State shall protect, preserve and improve the environment for the benefit of the community*." Based on the above principles, the Government of Sri Lanka has laid down various Acts including the National Environmental Act, No. 47 of 1980, to ensure environmental perseverance and protection. The relevant Environmental legislation applicable to the industry are listed in Table 1.3:

Table 1.3: Legislation, Regulations and Standards relevant for project activities

Laws and Regulations	Provisions and Main Content	Applicability to the project
Fauna and Flora Protection Ordinance, 1937 (Chapter 469); Fauna and Flora Protection (Amendment) Act, No. 49 of 1993 and Fauna and Flora Protection (Amendment) Act, No. 22 of 2009)	Provide for the protection and conservation of the fauna and flora and their habitats; for the conservation of the biodiversity and to provide for matters connected in addition to that or incidental to it.	Approvals from the Department of Wildlife Conservation are needed before the commencement of any project-related interventions after conducting a comprehensive biodiversity survey, if any of the sub-project activities are proposed within or near sensitive habitats, including wetlands and low-lying areas, in the project vicinity.
Felling of Trees Control Act, No. 09 of 1951 as Amended by Act, No. 30 of 1953 & as Amendment Act, No. 1 of 2000	This Act prohibits and controls the felling of specified trees.	Permits and approval from the Department of Forest are needed for commercially and/or ecologically valuable tree species if need cutting/felling.
Forest Ordinance, No. 16 of 1907; Forest Conservation Ordinance (Chapter 451); Forests (Amendment) Acts: No. 13 of 1966, No. 13 of 1982, No. 84 of 1988, No. 23 of 1995, No. 65 of 2009, Forest Regulations, No. 01 of 2008; Forest Rules (Gazette Notification No. 1600/18, 06.05.2009); Rules for Transport of Timber (Gazette Notification No. 1762/01, 11.06.2012)	These regulations control and regulate any development (including the conservation and utilization) that take place within or in the periphery of declared/protected forests; these are the formulation of national policies relating to the control and use of the forest resources.	Approvals from the Department of Forest are needed before the commencement of any project-related interventions after conducting a comprehensive biodiversity survey.
Geological Survey and Mines Bureau (GSMB) Act, No. 33 of 1992 Removal of Sand Regulations, No. 1 of 2007	Regulates the exploration for minerals, mining, transportation, processing, trading in the export of mineral products and usage of quarries and sand mines in the country.	Only small quantities of material will be used. No permits from the GSMB and/or CEA (EPL) and Local Authorities may be needed.
Agrarian Development Act, No. 46 of 2000	Paddy land for a purpose other than agricultural cultivation without the permission of the Commissioner-General of the Agrarian Services to be prohibited	Approval from the Commissioner-General of Agrarian Services is needed if any of the sub-project proposes to construct any structure within any extent of paddy land or does any act in furtherance of such purpose (filling, removing soil, utilizing a part of paddy land for any other purpose)
Town and Country Planning Ordinance, No. 13 of 1946 and The Town & Country Planning (Amendment) Act, No. 49 of 2000; Urban Development Authority (UDA) Law No 41 of 1978 and as amended	This Law has been introduced to promote integrated planning and implementation of economic, social, and physical development of certain areas as may be declared by the	Planning clearances may be needed from the UDA for some of the project sub-components proposed in areas declared under the UDA Act.

Laws and Regulations	Provisions and Main Content	Applicability to the project
by No. 70 of 1979, No. 04 of 1982 No. 49 of 1987 No. 41 of 1988; Urban Development Projects (Special Provisions) Act No 2 of 1980 and No. 44 of 1984	minister to be Urban Development Areas and for matters connected in addition to that or incidental to that.	
Municipal Council Ordinance No. 29 of 1947, the Urban Councils Ordinance No. 61 of 1939 and the Pradeshiya Sabha Act No. 15 of 1987	These outline the procedures in approval of building plans, approval of drainage management plans, etc., and regulations for disposal of municipal solid waste. Involvement of MOH/PHI in matters related to public health.	Approval of the building plans and subsequent Certificate of Conformity (COC) is needed as the proposed facilities are permanent structure. Approvals for drainage management plans, disposal of municipal solid waste are needed. Approvals of the MOH/PHI in matters related to public health are needed.
The Antiquities Ordinance, No. 9 of 1940 and The Antiquities (Amendment) Act, No. 24 of 1998, and regulations published in Gazette Extraordinary No. 1152/14 of 4 October 2000	This Ordinance requires that an Archaeological Impact Assessment be conducted about every proposed development project with a land area of over 0.25 ha.	Approval of the Department of Archaeology is needed if the sub-project involves excavations exceeding 500 m in length, and the land area is more than 0.25 ha.
Pradeshiya Sabha Act, No. 15 of 1987 National Environmental (Municipal Solid Waste) Regulations, No. 1 of 2009	Regulates dumping municipal solid waste at any place other than places designated for such purpose by the relevant local authority during proposed project activities	MSW that arise during the project activities has to be appropriately collected, stored, and disposed of. During operations, the generation of MSW is expected.
Circular No. ජගාපස 2011/1, dated 2011.02.10 issued by the Ministry of Disaster Management	Issuing Landslide Clearance for Construction in Landslide Prone Areas by the National Building Research Organization (NBRO)	Any construction in landslide-prone districts should obtain NBRO's clearance for construction to minimize the landslide disaster risk and to increase the safety of life and property from future slope instabilities. Ratnapura, Kegalla, Kandy, Matale, Nuwara Eliya, Badulla have been identified as landslide-prone districts, and therefore sub-projects in these district needs clearance for construction from the NBRO.
Labour Laws and Occupational Health and Safety Legislation in Sri Lanka relating to Industrial, Employment and Labour relations included in the Labour Code of Sri Lanka	Sri Lankan legislation comprises some laws, acts, and regulations designed to prevent the exploitation of workers and to protect their health and safety in the workplace. The project proponent and all the subordinates will be required to comply with all such laws and provisions that may be applicable.	Compliance required during pre-construction, construction, and decommissioning stages The following sources provide further information: Department of Labour; National Institute of Occupational Safety and Health[17]; and for an international perspective, and IFC's Environmental, Health, and Safety Guidelines for Health Care Facilities[18].

52. Following Clearances/Permits/Approvals should be obtained from relevant state agencies and/or Local Authorities before and during construction stages.

[17] http://www.niosh.gov.lk/

[18] https://www.ifc.org/wps/wcm/connect/960ef524-1fa5-4696-8db3-82c60edf5367/Final%2B-%2BHealth%2BCare%2BFacilities.pdf?MOD=AJPERES&CVID=jqeCW2Q&id=1323161961169

Table 1.4: Obtaining Permits/approvals/consents/no-objection letters for sub-projects

Permit/Consent/Approval	Authority from who to obtain	When to obtain	Remarks
1. Approval of the survey plan (and land ownership)	Local Authority	Before obtaining the building permit	Survey plans should be drawn to a scale of 1:1000 or one chain to an inch
2. Obtaining an assessment Number (if needed) and Registering in the property tax register (if required)			This can be done together with (1) above. Exemptions may be possible. Check whether any Entitlement certificates are needed.
3. Street Line Certificate/Building Line Certificate	Local Authority/PRDA/RDA - as applicable	Before setting out of the building	This has to be marked on the approved survey plan
4. Building Permit	Local Authority	Before the commencement of construction	If the area falls within a UDA declared area, check the requirements of conformity with the UDA
5. Design of the septic tank/soakage pit	Local Authority		Submit together with the Building application
6. Drainage management plan	Local Authority		
7. Recommendations for construction in sloping terrain (and in landslide-prone areas, unstable slopes, weak soil strata, etc.)	NBRO	Recommendations have to be obtained before commencement of any cuts/fills and setting out and construction	This is particularly applicable for Central, Uva and Sabaragamuwa PIUs where sites are located in sloping terrain
8. Permits for cutting/ mining/quarrying/excavations and subsequent transport of material (debris and topsoil, soil, gravel, sand, etc.)	Grama Niladari, Local Authority, Divisional Secretary, Geological and Mines Bureau - as applicable	Prior to any activity (for mining, excavation and cutting) and during construction (for transportation and disposal)	For debris and topsoil transportation, submit a proposal for disposal to the Local Authority, which is the responsibility of the Contractor
9. Tree cutting permits	Grama Niladari, Local Authority, Divisional Secretary, Timber Corporation - as applicable	Before cutting the trees	Consult the timber corporation for removal of timber. Removal/disposal of tree branches, stumps, etc. should be planned in consultation with the Local Authority, which is the responsibility of the Contractor
10. A permit from the Department of Archaeology	Department of Archaeology	Before the commencement of	Consult the Department of

		construction/demolition	Archaeology where there are buildings of more than 100 years old
11. Environmental Clearance	Central Environmental Authority	During the environmental assessment stage	This is applicable for any site that falls (wholly or partly) in any sensitive area
12. Environmental Protection License (EPL) and Scheduled Waste License (SWL) for Discharging of Health Care Waste	Central Environmental Authority	During operations of the hospital facilities	
13. Any other (to be specified on a site-to-site basis)			

Notes:

(i) The Design Consultants have to make sure that the designs:

- comply with all the building regulations (local authority and/or UDA), standards and specifications as applicable for hospitals and health care facilities
- incorporate green aspects so that natural ventilation and lighting are promoted and any other features built-in
- Besides, third-party liabilities should be identified (such as the possibility of cracks, damages to access roads and/or adjoining buildings, etc.) and responsibilities are passed on to the Contractor.

A2. Project-relevant International Agreements and Conventions

53. Sri Lanka has acceded to or ratified around 40 Multilateral Environmental Agreements, and those that are relevant to this project are shown in Table 1.5

Table 1.5: Project-related international agreements to which Sri Lanka is a party

Agreement	Ratification Date	Objectives
Atmosphere		
Vienna Convention for Protection of the Ozone Layer (1985)	15 Dec. 1989	Protection of the Ozone Layer through international cooperation in the areas of scientific research, monitoring and information exchange
Montreal Protocol on Substances That Deplete Ozone Layer (1987)	12 Dec. 1989	Reduction and eventual elimination of the consumption and production of Un-anthropogenic Ozone Depleting Substances
United Nations Framework Convention on Climate Change (UNFCCC-1992)	23 November 1993	Stabilization of greenhouse gas (GHG) concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climatic systems
Kyoto Protocol (1997)	3 October 2002	The Annex 1 parties (Developed Countries) to reduce their collective emissions of greenhouse gases by at least 5% of the 1990 level by the period 2008 –2012
Biodiversity		
International Plant Protection Convention (1951)	12 February 1952	To maintain and increase international cooperation in controlling pests and diseases of plants and plant products, and in preventing their introduction and spread across national boundaries
Plant Protection Agreement for Asia and Pacific Region (1956)	27 February 1956	To prevent the introduction into and spread within the region of destructive plants
CITES - Convention on International Trade in Endangered Species of Wild Fauna & Flora (1973)	4 May 1979	To protect specific endangered species from being over-exploited by adopting a system of import/export permits, for regarding the procedure

Agreement	Ratification Date	Objectives
Convention on the Conservation of Migratory Species (1979)	6 June 1990	To protect those species of wild animals which migrate across or outside national boundaries
The Convention on Wetlands (Ramsar Convention) (1971)	15 October 1990	This is the intergovernmental treaty that provides the framework for the conservation and wise use of wetlands and their resources.
Convention on Biological Diversity (CBD-1992)	23 March 1994	Conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including appropriate access to genetic resources and by appropriate transfer of relevant technologies and proper funding
Environmental Modification Convention (1976)	5 October 1978	This is an international treaty prohibiting the military or other hostile use of environmental modification techniques having widespread, long-lasting, or severe effects.
Biosafety, Health and Sanitation		
Agreement on the Application of Sanitary and Phytosanitary Measures (1995)	1995	Broadly, the sanitary and phytosanitary measures covered by the agreement are those aimed at the protection of human, animal or plant life or health from certain risks.
Biological Weapons Convention (1972)	26 March 1975	The Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and their Destruction
Cartagena Protocol on Biosafety (2000)	11 Sept 2003	The Cartagena Protocol on Biosafety to the Convention on Biological Diversity is an international agreement on biosafety as a supplement to the Convention on Biological Diversity
Cultural Heritage		
Convention concerning the protection of the World Cultural and Natural Heritage (1972)	6 June 1980	To establish a system of collective protection of the cultural and natural heritage of outstanding universal value organized permanently and by modern scientific methods
The UNESCO World Heritage Convention (1972)	06 June 1980	Convention concerning the protection of the World Cultural and Natural Heritage
Chemicals		
Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and Their Disposal (1989)	28 August 1992	To reduce transboundary movements of hazardous waste; to dispose of hazardous and other waste as close as possible to the source; to minimize the generation of hazardous waste; to prohibit shipments of hazardous waste to countries lacking the legal, administrative and technical capacity to manage & dispose of them in an environmentally sound manner;
Rotterdam Convention (1998)	19 January 2006	To promote shared responsibility and cooperative efforts in the international trade of certain hazardous chemicals, to protect human health and the environment; to contribute to the environmentally sound use of those hazardous chemicals by facilitating information exchange, providing for a national decision-making process on their import/export
Stockholm Convention on Persistent Organic Pollutants (POPs) (2001)	22 December 2005	To protect human health and the environment from persistent organic pollutants (POPs)

B. ADB Policy on Environmental & Social safeguards

54. ADB's Environment Policy requires that environmental issues be considered in all aspects of the Bank's operations. The detailed requirements are defined in the Safeguard Policy Statement (2009), which builds upon the three previous policies on the environment, involuntary resettlement, and indigenous peoples, and brings them into a consolidated policy framework that enhances their effectiveness and relevance. The SPS affirms that ADB considers environmental and social sustainability as a cornerstone of economic growth and poverty reduction in Asia and the Pacific and is committed to ensuring the social and environmental sustainability of the projects it supports.

55. In this context, safeguards are operational policies that seek to avoid or reduce to acceptable levels adverse environmental and social impacts, including protecting the rights of those likely to be affected or marginalized by the development process. The objectives of ADB's safeguards are to:

(i) avoid adverse impacts of projects on the environment and affected people, where possible

(ii) minimize, mitigate, and/or compensate for adverse project impacts on the environment and affected people where avoidance is not possible; and

(iii) help borrowers/clients strengthen their safeguard systems and develop the capacity to manage environmental and social risks.

56. The Safeguard Policy Statement applies to all projects or components financed, administered or otherwise supported by ADB, regardless of whether ADB is the funder; and ADB will not fund projects that do not comply with the SPS and the host country's social and environmental laws and regulations.

57. Environmental safeguards are triggered if a project is likely to have potential environmental risks and impacts, and the objectives are to ensure the environmental soundness and sustainability of projects and support the integration of environmental considerations into the project decision-making process. The principal tool for achieving these aims is an environmental assessment, which is a process of environmental analysis and planning to avoid or reduce the environmental impacts associated with a project. The nature of the assessment required depends on the significance of environmental impacts, which are related to the type and location of the project; the sensitivity, scale, nature, and magnitude of its potential impacts; and the availability of cost-effective mitigation measures.

58. Screening **and Categorization:** ADB screens a project in the preparation stage to (i) reflect the significance of potential impacts or risks that the project might present; (ii) identify the level of assessment and institutional resources required for the safeguarding process; and (iii) determine the requirements for public disclosure. Screening reviews necessary information on project design and operation, the proposed project site/s, and the general environmental/social features, and is aided by ADB's Rapid Environmental Assessment (REA) checklists. By the significance of the potential environmental impacts and risks, projects are assigned to one of the following four categories:

(i) **Category A:** projects likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented, and which may affect an area larger than the location subject to physical works. An Environmental Impact Assessment (EIA) is required.

(ii) **Category B:** projects with potential adverse impacts that are less significant than those of Category A. Impacts are site-specific, few are irreversible. In most cases, impacts can be mitigated more readily than those for Category A projects. An Initial Environmental Examination (IEE) is required.

(iii) **Category C:** projects likely to have minimal or no adverse environmental impacts. No environmental assessment is required, although environmental implications are reviewed.

(iv) **Category FI:** projects where ADB funds are invested in or through a Financial Intermediary (FI). ADB conducts safeguard due diligence of the FI's portfolio and requires an appropriate environmental and social management system (ESMS) in place, to address environmental or social risks.

59. The HSEP is categorized as an Environmental Category B. As such the project will establish an environmental review process commensurate with the level of anticipated impacts and policy requirements of a category B to ensure that it is environmentally sound

and are designed to operate in compliance with applicable regulatory requirements.

60. Environmental **Assessment** conducted under the SPS is governed by a series of policy principles, which define the scale, content, and approach to the study. The specific requirements of the Environment Safeguard Policy are given in Appendix 1 of the SPS; and the Annex to Appendix 1 provides an outline of an EIA report, which includes guidance on the overall layout and the content of each section. Guidance on the practical approach to conducting the environmental assessment is provided in the Environment Safeguards Good Practice Sourcebook (ADB, 2012). EIA and IEE studies follow the same general approach as prescribed in these documents, and the SPS states that the level of detail and comprehensiveness of the study should be commensurate with the significance of environmental impacts and risks so that an IEE may have a narrower scope. These documents were all consulted extensively in conducting this study and preparing this report.

61. Public **Consultation:** The SPS requires the borrower/client to carry out meaningful consultation with affected people and other stakeholders to facilitate their informed participation. This should: (i) begin early during project preparation and continue throughout the project cycle; (ii) provide timely disclosure of adequate, relevant and understandable information; (iii) be free of intimidation and coercion; (iv) be gender-inclusive and responsive, and tailored to the needs of disadvantaged and vulnerable groups; and (v) enable incorporation of all relevant views into decision-making, including project design, impact mitigation, and sharing of project benefits and opportunities. The SPS specifies that for a Category A project, at least two consultation exercises are needed: the first at the early stage of EIA fieldwork; and the second when the draft EIA is available. The results of the consultation process are documented in the environmental assessment report.

62. **Information Disclosure:** The SPS requires the borrower to make relevant environmental information available to affected people and other stakeholders promptly, in an accessible place and an understandable form and language(s). This normally involves providing the draft, and final IEE/EIA reports in public buildings in the study area. Still, for complex studies, brochures, leaflets, etc. can also be used, along with non-written communication methods if any stakeholders are illiterate. ADB also requires the borrower to provide the following for dissemination to a broader audience via the ADB website:

(i) The final EIA or IEE

(ii) New or updated EIA/IEE, supplementary reports and/or corrective action plans, if prepared during project implementation

(iii) Environmental monitoring reports, also during project implementation

(iv) In the case of a Category A project, the draft EIA (including the draft EMP) must be provided at least 120 days before ADB Board consideration

C. Administrative Framework

63. The MOHIMS through the PMU and PIUs will deliver the project. Management of environmental safeguards of the project is linked to Component 1 only, which involves upgrading/expansion to physical infrastructure in primary care health facilities. Component 2 and 3 will involve only soft development and vehicle/equipment procurement; a safeguard review process will not be relevant.

64. The MOHNIM through its PMU and the provinces through the project implementation units (PIUs) will be responsible for conducting environmental screening and follow up assessments, preparing relevant documents and monitoring compliance. The MOHIMS has a Directorate of Environmental and Occupational Health (DE&OH) headed by a Deputy Director-General and has a separate budget line under the MOHIMS. The DE&OH has sufficient staff strength and capacity for occupational health and safety, food and drug safety, health care waste management, etc. Regarding HCWM, the DE&OH has facilitated many EPLs/SWLs for major hospitals in all nine provinces so far through the provision of training,

evaluation and follow up support. The MOHNIM will be directly involved in the project as the chair of the Ministerial Project Steering Committee. The MOHNIM also has prior experience implementing projects funded by other multilateral banks such as the World Bank with similar safeguards requirements as well as by several bilateral donors.

65. The PMU will closely collaborate with the provincial and regional directorates of health services through their representation in the province-level PIUs. Since HCW management planning will be a crucial component of safeguards assessments and monitoring, it is essential to note the province level capacity for same. None of the PDHSs has a formal program or dedicated staff for HCWM that sets the direction and follows up with HCFs. The existing capacities between the provinces also vary as seen by the difference in the status quo regarding HCWM.

66. Implementing agencies, the PIUs in each of the four provinces, and relevant other staff from the PDHSs and the RDHSs will require training and capacity building in better understanding of project-related environmental issues, application of safeguard procedures under the project, and for the planning and monitoring of HCWM. The PMU under the MOHNIM will have a full-time dedicated environmental specialist to overcome capacity constraints within the implementing agencies and to provide the necessary implementation support. The PMU will design and deliver training and capacity building program as necessary for safeguards management. A structured and phased out training and evaluation program will also need to be implemented to improve the current level of awareness and understanding for HCWM, which would be done in close collaboration with the DE&OH.

III. DESCRIPTION OF THE PROJECT

A Sub-projects in Badulla District

A.1 Location of the sub-projects

67. In Badulla District, sub-projects involving civil works for five healthcare centres have been proposed under Round 2 Phase 1 of the HSEP. These five healthcare centres are shown in Figure 3.2, and the sub-project details are provided in Section A.2.

A.2 Existing Condition, Need for each sub-project & Proposed Components

A.2.1 METIGAHATENNA DHB

A.2.1.1 Location and Existing condition

Table 3.1: Location details of Metigahatenna DHB

Province	Uva
District	Badulla
DS Division	Lunugala
Local Authority	Lunugala PS
GN Division	18 Metigahatenna

The location map of Metigahatenna DH is shown in Figure 3.1.

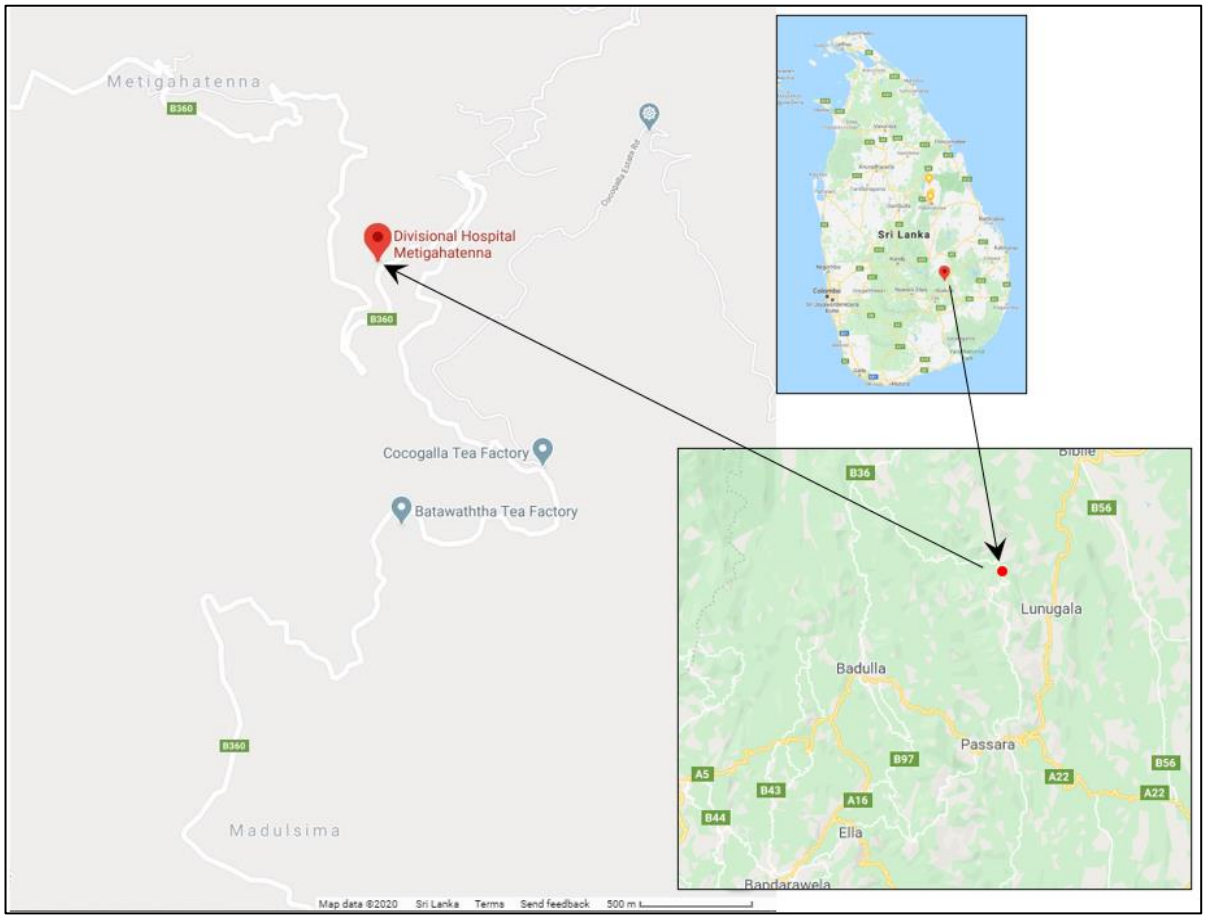


Figure 3.1: Location map of Metigahatenna DH (7° 4'8.42"N 81° 9'42.05"E)

F

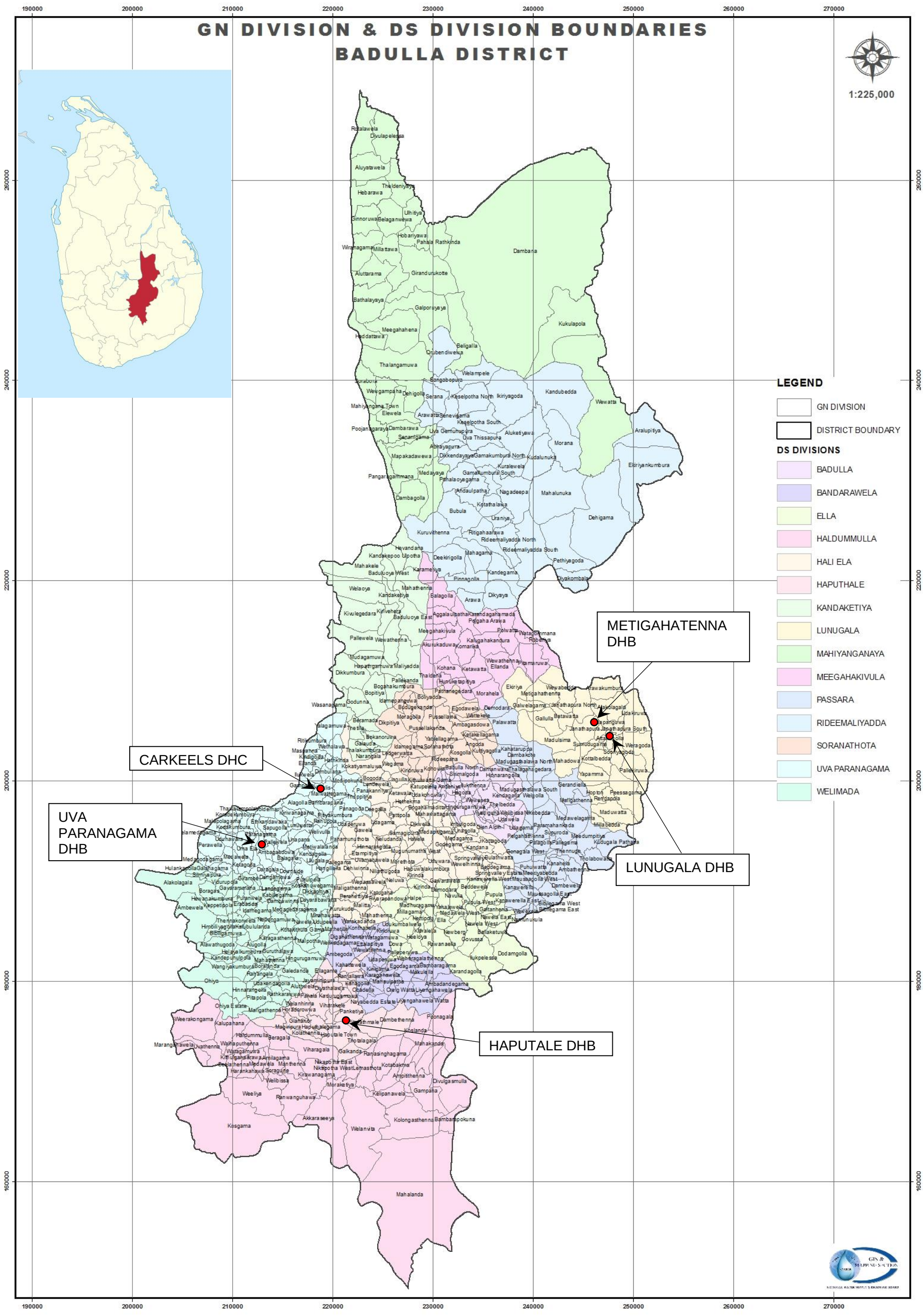


Figure 3.2: Sub-project locations in Badulla District

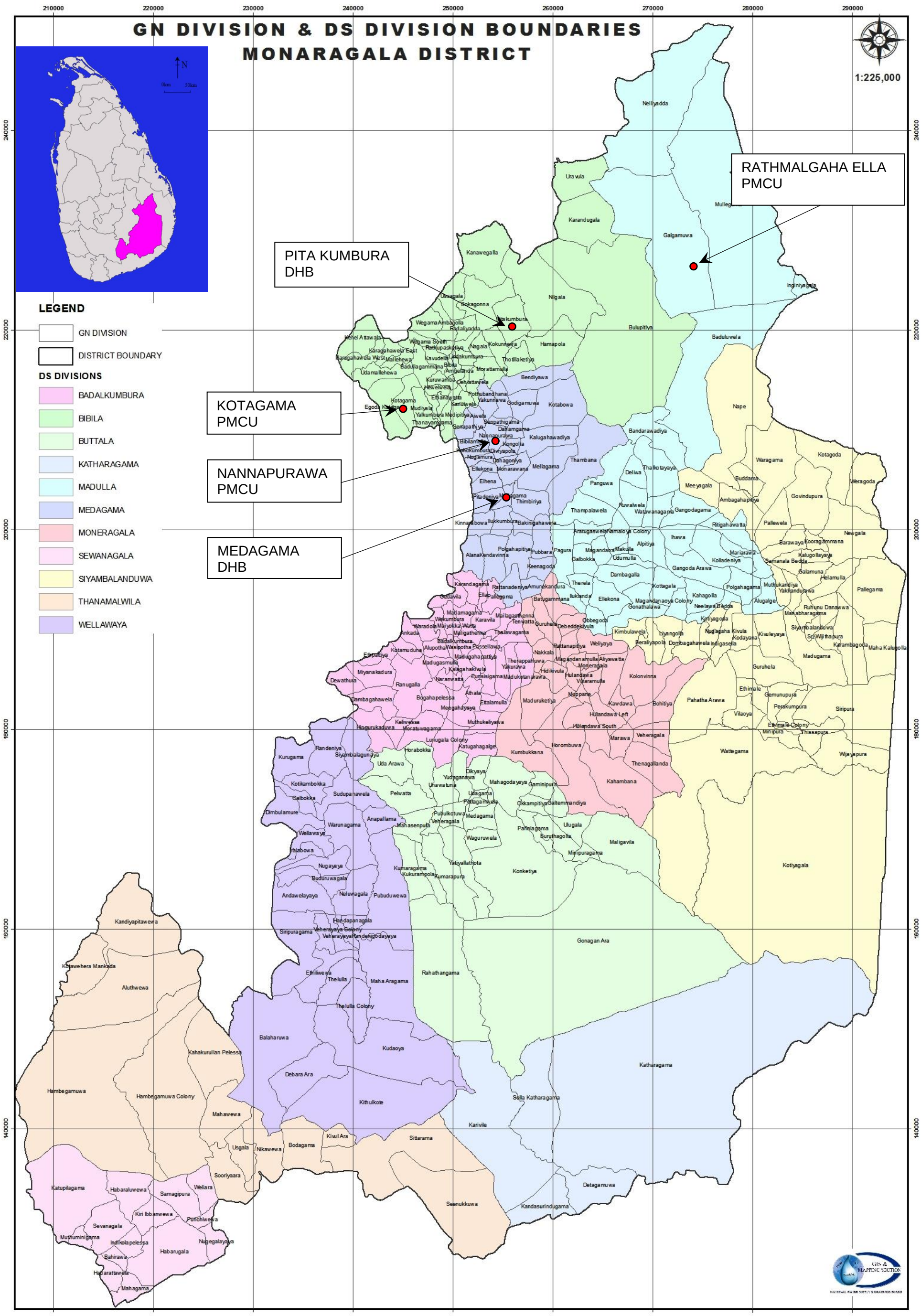


Figure 3.3: Sub-project locations in Monaragala District

68. Metigahatenna Divisional Hospital is located by the side of the B360 Passara-Madulsima-Metigahatenna road between the small towns of Metigahatenna and Madulsima. Batawatta tea factory and Cocogalla tea factory is located about 4.0 km and 2.5 km towards Madulsima. B/Wewabedda Vidyalaya is located in the close proximity of the DH. B/Battawatta Tamil Vidyalaya is located about 1.5 km from the DH. The land belonging to the DH is a large extent of land about 16 acres and is undulating with moderate-steep slopes.

Existing clinic area including the dental

OPD area

Reception counter and registration

ETU

Figure 3.4: Existing condition of the facilities available at the Metigahatenna DH

69. The following are the facilities available at the hospital: OPD, ETU, pharmacy, two male, one maternity, one pediatric and one female ward, staff quarters (for doctors: one for the DMO, one for the MO and one for the nurses), mortuary (non-functional), and other related facilities.

70. The access road for an ambulance entrance is being constructed. The dental clinic and the clinic area is located in a new building. The new building will be constructed after demolition of an old building which is not in use at present. The new building will have access from the B360 Passara-Madulsima-Metigahatenna road.

Table 3.2: Number of patients used the hospital facilities in 2018

No. of wards	5
No. of Beds	54
No. of outdoor patients	23,927
No. of indoor patients	2,110
Clinics - NCD - Medical - Diabetes - Maternity	 Twice a week (25 patients per week) Weekly (150 patients per week) Weekly (50 patients per week) Weekly (15 patients per week)

Source: Department of Census and Statistics - Statistical Handbook, 2019

A.2.1.2 Need for sub-project

71. From the stakeholder consultations, it was found that the OPD and the ETU sections are very crowded, during OPD hours and clinic days. The facilities available for the patients are not sufficient, especially waiting areas, disabled access, washroom facilities, etc. Space availability for general services such as the reception area, patients' registration area, record-keeping areas, dispensary, pharmacy, etc. are also inadequate. The facilities available for healthcare has to be further developed for a better and efficient service.

Table 3.3: GN Divisions within the catchment and the population (2018)

GN Division	Male	Female	Total
Lunugala DS Division			
18 Metigahatenna	634	558	1,192
18A Wewabedda	1,211	1125	2,336
18 Ekiriya	672	452	1,124
18D Batawatta	877	575	1,452
18C Galwelagama	233	240	473
18B Gallulla	947	919	1,866
95A Janathapura North	297	265	562
95 Janathapura	637	728	1,365
18C Madulsima	2,548	2,368	4,916
Meegahakiula DS Division			
16B Wewatenna	319	274	593
16C Ellanda	390	436	826
16A Pitamaruwa	736	675	1,411

Source: Sampath Pethikada of the respective Divisional Secretariats (2018)

72. From Table 3.2, it is clear that patient visits in 2018 were nearly 24,000, and the catchment areas have a population of about 20,000. To reap the maximum benefits out of the health-sector reforms proposed under the HSEP, it is essential that facilities of the divisional hospital be developed, of which construction of the following buildings are needed, as detailed in A2.1.3.

A.2.1.3 Proposed tasks/interventions at Metigahatenna DHB

73. The following civil work is proposed for Metigahatenna DHB.

- Construction of new building (See Figure 3.5)
- Altering drainage path (See Figure 3.5) and construction of new drains
- Construction of new soakage pit & septic tank
- Access from Passara Road

74. The new building will be constructed after demolition of an old building which is not in use at present. The final level of the upper floor will be at the road level, and direct entrance to the new building will be facilitated through the road. Two trees will have to be cut. No levelling is needed for the construction. The rainwater disposal system has to be adequately developed after consultations with the hospital authorities. The steep embankment in the front of the site is not stable, and therefore the existing retaining wall in front of the dental clinic needs to be extended.

The front view of the building to be demolished.

The side view and the gap between the road and the building to be demolished.

The retaining wall in the front should be extended to protect the embankment

The toilet and the clinic area is located adjacent to the site

Figure 3.5: Location-specific details at Metigahatenna DHB

Tracing no 2020/BA/02D

D.M.W.B.Dissanayake
Registered Licensed Surveyor & Leveler
"Chandranie" Niwasa
Dambagalla,
Monaragala.

PLAN OF PRIMARY MEDICAL CARE UNIT MITIGAHATHENNA

Scale 1:1000

Village :Mitigahathenna
D.S.Division :Passara
District :Badulla
Province :Uva

Reference

MDn : Masonry Drain
MH : Manhole
BW : Boundary Wall
EP : Electric Post
RW : Retaining Wall
TR : Tree
B : Bank
P : Permanent Building
○ : Lot No

Lot No:	Schedule of Boundaries							
	Hectares	A	R	P	North	East	South	West
A	0.2023	0	2	0.00	Path	Land Claimed By Mitigahathenna Hospital	Land Claimed By Mitigahathenna Hospital	Road(RDA)
Total	0.2023	0	2	0.00				

Note:
All the levels of this plan based on the Arbitrary value

Surveyed on 04.05.2020

Surveyed and Drawn by :
D.M.W.B.Dissanayake
Licd. Surveyor
07.05.2020

Figure 3.6: Survey Plan of the Metigahatenna DHB

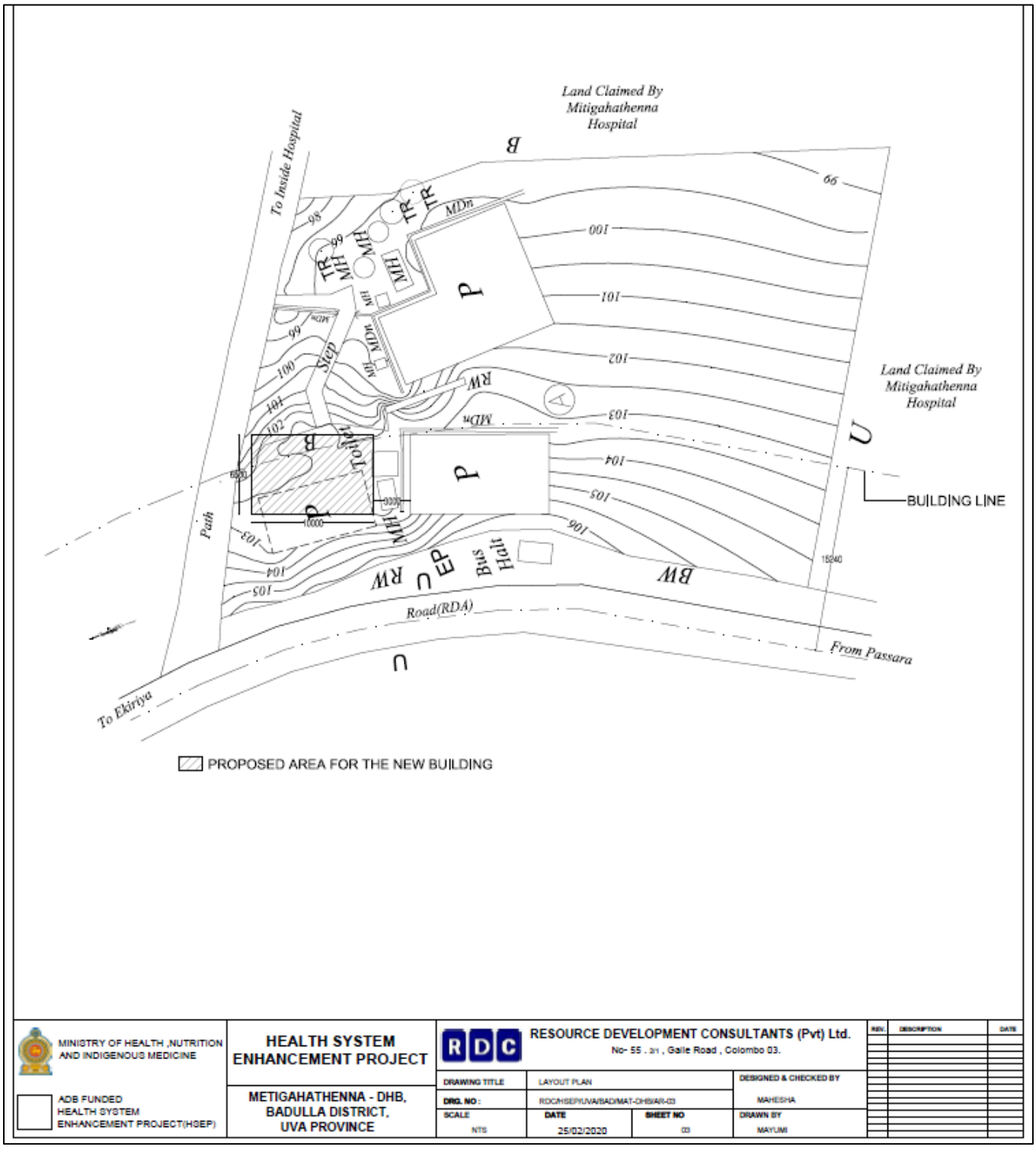


Figure 3.7: Location and Layout of new construction works proposed for Metigahatenna DHB

A.2.2 Uva Paranagama DHB

A.2.2.1 Location and Existing condition

Table 3.4: Location details of Uva Paranagama DHB

Province	Uva
District	Badulla
DS Division	Uva Paranagama
Local Authority	Uva Paranagama PS
GN Division	43 Paranagama

75. The location map of Uva Paranagama DH is shown in Figure 3.8.

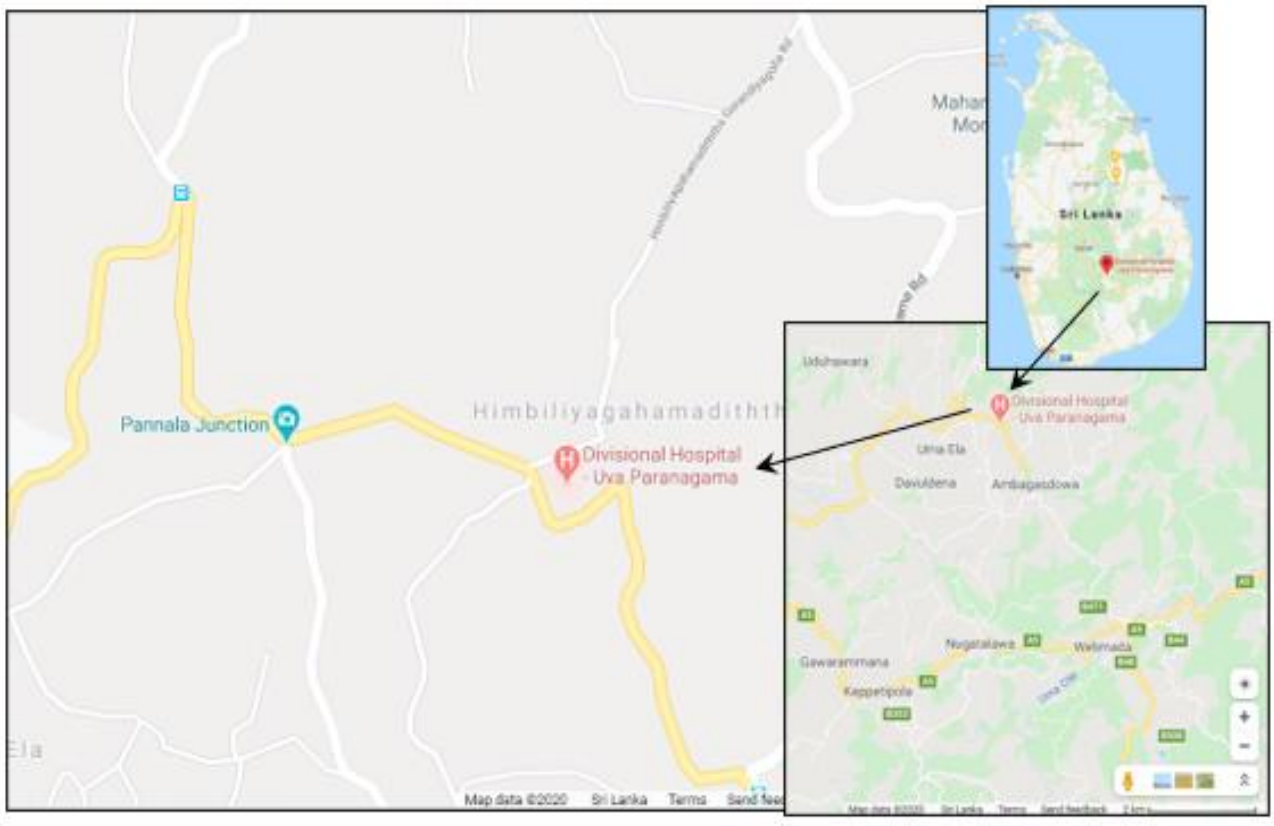


Figure 3.8: Location map of Uva Paranagama DH (6°56'16.9"N 80°53'25.7"E)

76. Uva Paranagama Divisional Hospital is located about 7 km away from Welimada Town. It can be accessed via B471 Udapussellawa-Welimada Road and Rendapola-Galahagama-Ambagasdowa Rd and then on Welimada - Uduhawara Rd. The hospital is located at Himbiliyagahamadiththa Junction by the side of Himbiliyagahamadiththa-Gorandiyagolla Road and Welimada-Uduhawara Road. The area is relatively populated and surrounded by home gardens and agricultural land. The Uva Paranagama post office is located close to the hospital. There are no other sensitive locations within the 500 m periphery. The doctors' quarters and the laboratory are located along Gorandiyagolla Road about 300 m away from the main hospital.

The main building where clinics, OPD and the ETU are located

Access to ETU is obstructed by a corridor and has to be altered for easy access

The waiting area for the OPD

The waiting area for the clinics

Figure 3.9: Existing condition of the facilities available at the Uva Paranagama DH

77. The following are the facilities available at the hospital: OPD, ETU, pharmacy, laboratory, dental clinic, 01 male, 01 female, 01 maternity ward and 01 clergy wards, staff quarters (for doctors: 02), mortuary, and other related facilities.

78. The doctors' quarters and the laboratory are located a little away from the hospital premises, which is about 300 m from the hospital premises.

Table 3.5: Number of patients used the hospital facilities in 2018

No. of wards	4
No. of Beds	72
No. of outdoor patients	71,748
No. of indoor patients	6,811
Clinics - NCD - Medical - Diabetes - Maternity	 Twice a week (30–50 patients per week) Weekly (300 patients per week) Weekly (10–15 patients per week) Weekly (25–30 patients per week)

Source: Department of Census and Statistics - Statistical Handbook, 2018

A.2.2.2 Need for sub-project

79. At present, the laboratory is located about 300 m away from the hospital. It is very inconvenient for health care staff to transfer the samples to the laboratory several times a day by foot, carrying the samples in small containers. Besides, there is no office space for keeping records and other functions. There is a dedicated space within the hospital premises for the laboratory and new office space. The project is intended to provide these two new spaces. The access to ETU is obstructed by a corridor located at the entrance. Direct access for patients directly from the ambulance or a vehicle should be provided. The existing entrance to ETU has to be altered. Also, a car porch has to be constructed at the entrance to the main building so that the ambulance or vehicles carrying patients can be disembarked without getting wet during rains.

Table 3.6: GN Divisions within the catchment and the population (2018)

GN Division	Female	Male	Total
Uva Paranagama DS Division			
43 Paranagama	747	749	1496
47F Pannalagama	806	780	1586
47E Ketagoda	1079	888	1967
46A Medawela	1064	973	2037
46C Karagahaulpatha	887	772	1659
44 Uduhawara	649	606	1,255
44C Koradekumbura	528	583	1,111
43F Kodakumbura	640	713	1,353
43B Hangunnawa	609	667	1,276
47 Uma Ela	1004	892	1,896
43 E Ranhawadigama	609	573	1,182
43A Thawalampola	441	370	811
43D Mudanawa	269	257	526
45A Busdulla	547	569	1,116
42 Sapugolla	941	922	1,863
45C Kurundugolla	482	538	1,020
47A Ambagasdowa	1,187	1,068	2,255
45 Kumarapattiya	1,208	1,102	2,310
45D Pallewela	723	714	1,437
45B Balagala	853	810	1,663

Source: Sampath Pethikada of the respective Divisional Secretariats (2018)

80. From Table 3.5, it is clear that the patient visits in 2018 were nearly 72,000, and catchment areas have a population of about 30,600. To reap the maximum benefits out of health-sector reforms proposed under the HSEP, it is essential that facilities of the divisional hospital be developed, of which construction of the following buildings are needed, as detailed in A2.2.3.

A.2.2.3 Proposed components

A.2.1.3 Proposed tasks/interventions at Uva Paranagama DHB

81. The following civil works are proposed for Uva Paranagama DHB.

- Renovation and rehabilitation of an old building to accommodate the laboratory and hospital office (See Figure 3.10) construction of a retaining wall behind the building
- Alteration of the access to the ETU and construction of a car porch
- Altering drainage path (See Figure 3.10) and construction of new drains
- Construction of new soakage pit & septic tank
- Access to the renovated building from the hospital entrance

The side view of the building to be renovated

The embankment located at the back of the building is unstable

Alteration of the access to the ETU and the location where car porch will be built

The access road to the building needs to be properly constructed

The slope needs a retaining wall, and the access road to the stores needs restoration

Figure 3.10: Location-specific details at Uva Paranagama DHB

A2.3 Lunugala DHB

A.2.3.1 Location and Existing condition

Table 3.7: Location details of Lunugala DHB

Province	Uva
District	Badulla
DS Division	Lunugala
Local Authority	Lunugala PS
GN Division	94G Sumudugama

82. The location map of Lunugala DH is shown in Figure 3.11.

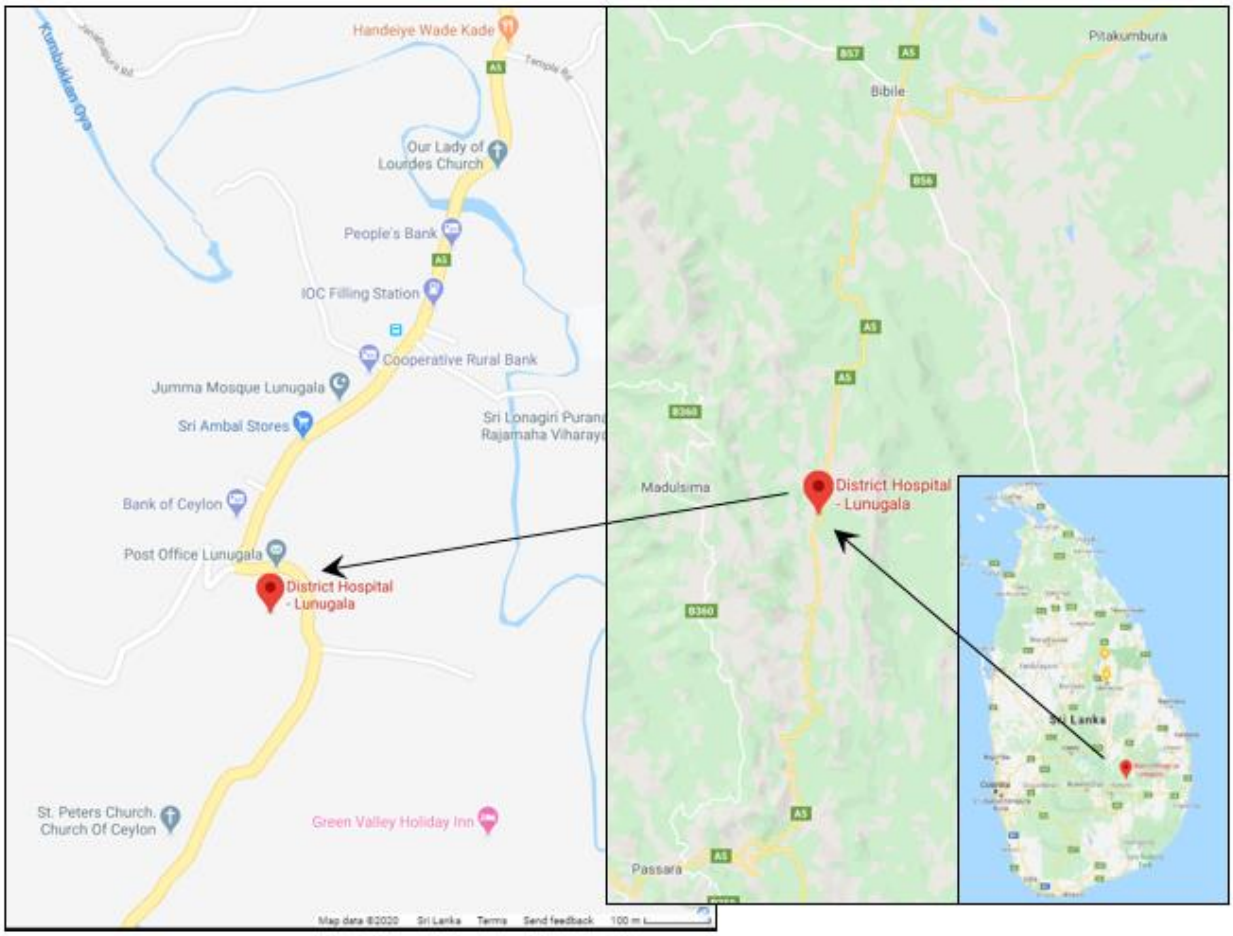


Figure 3.11: Location map of Lunugala DH (7° 2'15.12"N, 81°12'3.33"E)

83. Lunugala Divisional Hospital, located close to Lunugala Town, is a reasonably populated area. Lunugala Divisional Hospital is located by the side of the A4: Peradeniya – Badulla – Chenkalady Highway. Lunugala Post Office in the neighbourhood of the hospital. B/Lunugala Tamil Vidyalaya and B/Sri Ramakrishna College are located about 100 m from the DH. The land belonging to the DH is a large extent of land about 2.5 acres and is undulating with moderate-steep slopes.

Maternity ward located adjacent to the site

OPD waiting area

Consultation areas and the ETU

Record room

Figure 3.12: Existing condition of the facilities available at the Lunugala DH

84. The following are the facilities available at the hospital: OPD, ETU, pharmacy, two male, one maternity, one children's and female wards, staff quarters (for doctors: one for the DMO, one for the MO and one for the dentist, nurses accommodation (not in use at present) and one clerk's accommodation, mortuary, and other related facilities.

Table 3.8: Number of patients used the hospital facilities in 2018

No. of wards	4
No. of Beds	72
No. of outdoor patients	71,748
No. of indoor patients	6,811
Clinics - NCD - Medical - Diabetes - Maternity	 Twice a week (75–100 patients per week) Weekly (150–200 patients per week) Weekly (50 patients per week) Weekly (15 patients per week)

Source: Department of Census and Statistics - Statistical Handbook, 2018

A.2.3.2 Need for sub-project

85. From the stakeholder consultations, it was found the OPD and the ETU sections are very crowded, during OPD hours and clinic days. The facilities available for the patients are not sufficient, especially waiting areas, disabled access, washroom facilities, etc. Space availability for general services such as the reception area, patients' registration area, record-keeping areas, dispensary, pharmacy, etc. are also inadequate.

86. The facilities available for healthcare has to be developed for a better and efficient service.

Table 3.9: GN Divisions within the catchment and the population (2018)

GN Division	Female	Male	Total
Lunugala DS Division			
94A Lunugala Town	856	790	1,646
94F Attanagolla	593	584	1,177
94 Udapanguwa	959	824	1,783
94G Sumudugama	865	797	1,662
95 Janathapura	637	728	1,365
95A Janathapura North	297	265	562
95B Janathapura South	231	240	471
94D Sooriyagoda	431	437	868
93 Kotalbedda	1,123	888	2,011
94B Yapamma	584	570	1154
18D Batawatta	844	575	1452
18A Wewabedda	1211	1125	2336
94E Alakolagama	556	536	1092
94C Arwakumbura	971	1041	2012
92A Udakiruwa	236	245	481
92 Pallekiruwa	366	416	782
92B Weragoda	159	177	336

Source: Sampath Pethikada of the respective Divisional Secretariats (2018)

87. From Table 3.8, it is clear that the patient visits to the hospital in 2018 were nearly 72,000, and the catchment areas have a population of about 21,000. To reap the maximum benefits out of the health-sector reforms proposed under the HSEP, it is essential that facilities of the hospital be developed, of which construction of the following buildings are needed, as detailed in A2.3.3.

A.2.3.3 Proposed tasks/interventions at Lunugala DHB

88. The access road to the site has to be widened before demolition of the building. A large mango tree has to be cut for road widening. This mango tree is very old, and there is a risk that it will fall during heavy winds. Therefore, its removal is needed.

89. The following civil works are proposed for Lunugala DHB.

- Construction of new building (See Figure 3.13)
- Altering drainage path (See Figure 3.13) and construction of new drains
- Construction of new soakage pit & septic tank
- Widening of the access road from A4 Road

90. An old building (previously used as the nurses' accommodation building) has to be demolished before preparation of the site for construction. Part of the proposed plot of land is bare. A small amount of cut is needed to properly place the building. Rainwater drains can be connected to the drain that is already carrying runoff from the upper parts of the hospital premises. This drain is connected to the roadside drain.

The access road from the A4 Road to the proposed site

Old building to be demolished

The rear side of the building to be demolished

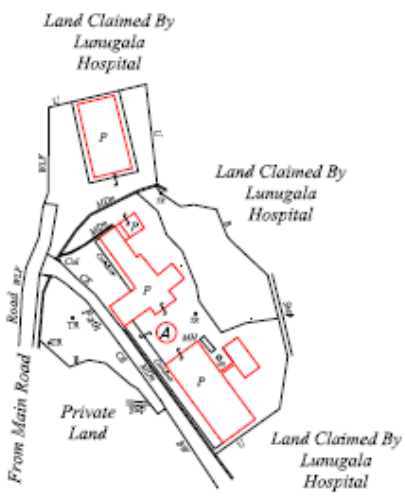
Part of the proposed site is a bare plot of land

Figure 3.13: Location-specific details at Lunugala DBH

Tracing no 2020/BA/01D

D.M.W.B.Dissanayake
Registered Licensed Surveyor & Leveler
"Chandranie" Niwasa
Dambagalla,
Monaragala.

PLAN OF PRIMARY MEDICAL CARE UNIT LUNUGALA



Scale 1:1000

Village :Lunugala
D.S.Division :Badulla
District :Badulla
Province :Uva

Reference

MDn : Masonry Drain
MH : Manhole
Cul : Culvert
WLF : Wire Live Fence
CE : Concrete Edge
TR : Tree
B : Bank
P : Permanent Building
○ : Lot No

Lot No:	Schedule of Boundaries							
	Hectares	A	R	P	North	East	South	West
A	0.2159	0	2	5.00	Land Claimed By Lunugala Hospital	Land Claimed By Lunugala Hospital	Land Claimed By Lunugala Hospital	Road & Private Land
Total	0.2159	0	2	5.00				

Note:
All the levels of this plan based on the Arbitrary value

Surveyed on 04.05.2020

Surveyed and Drawn by :
D.M.W.B.Dissanayake
Licd. Surveyor
07.05.2020

Figure 3.14: Survey Plan of the Lunugala DBH

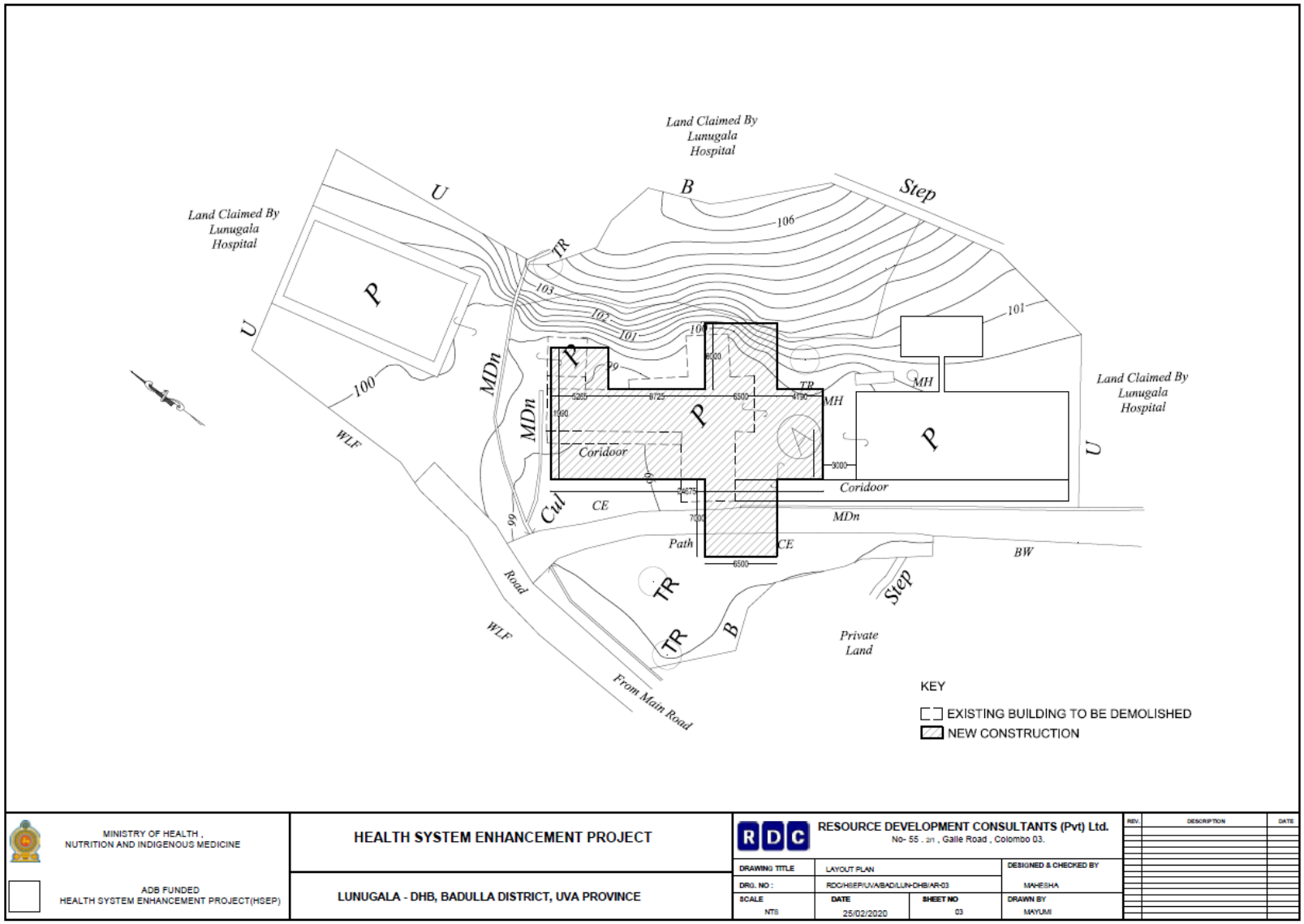


Figure 3.15: Location and Layout of new construction works proposed for Lunugala DHB

A2.4 CARKEELS DHC

A.2.4.1 Location and Existing condition

Table 3.10: Location details of Carkeels DHC

Province	Uva
District	Badulla
DS Division	Uva Paranagama
Local Authority	Uva Paranagama PS
GN Division	38E Carkeels

91. The location map of Carkeels DH is shown in Figure 3.16.

Figure 3.16: Location map of Carkeels DH (6°59'36.69"N, 80°56'36.89"E)

92. Carklees DHC is located about 22 km from Welimada Town on B471 Udapussellawa-Welimada Road. The hospital premises is located very close to Carkeels Tea Estate and is about 200 m away from the B471 Udupussellawa Road on the road serving the Tea Factory and the nearby villages, including the estate workers settlements.

93. The area is sparsely populated, and the majority of the inhabitants are estate workers. There are several traditional villages such as Rahupola, Diyabokandura, Bambarapana and Viharagoda. The hospital is located on hilly and sloping and hilly terrain, and the access roads are narrow.

The reception and OPD area

The waiting area for patients

The dispensary area

ETU

Record keeping area

Figure 3.17: Existing condition of the facilities available at the Carkeels DHC

94. The facilities available at the hospital include OPD, ETU, pharmacy, one doctor's quarters.

Table 3.11: Number of patients used the hospital facilities in 2018

No. of wards	-
No. of Beds	-
No. of outdoor patients	21,770
No. of indoor patients	-
Clinics - NCD - Medical - Diabetes - Maternity	 Twice a week (25–30 patients per week) Weekly (35–40 patients per week) Weekly (20 patients per week) Weekly (15 patients per week)

Source: Department of Census and Statistics - Statistical Handbook, 2018

A.2.4.2 Need for sub-project

95. From the stakeholder consultations, it was found that the OPD and the ETU sections have minimal space, during OPD hours. The clinics are conducted at a separate building located next to the hospital. However, additional space is needed for individual clinics and an additional Medical Officer. Record-keeping areas, dispensary, pharmacy, etc. are also inadequate.

Table 3.12: GN Divisions within the catchment and the population (2018)

GN Division	Male	Female	Total
DS Division			
38E Carkeels	976	934	1910
42B Alagolla	1589	1565	3154
38C Gampaha	955	937	1892
39 Bambarapana	751	730	1481

Source: Sampath Pethikada of the respective Divisional Secretariats (2018)

96. From Table 3.12, it is clear that the patient visits in 2018 were nearly 22,000, and the catchment areas have a population of about 8,500. To reap the maximum benefits out of the health-sector reforms proposed under the HSEP, it is essential that facilities of the hospital be developed, of which construction of the following buildings are needed, as detailed in A2.4.3.

A.2.4.3 Proposed components

97. The following are proposed at Carkeels DHC.

- New building to be built next to the existing premises, and related facilities, such as septic tank and the soakage pit, rainwater drains, access to the new building.

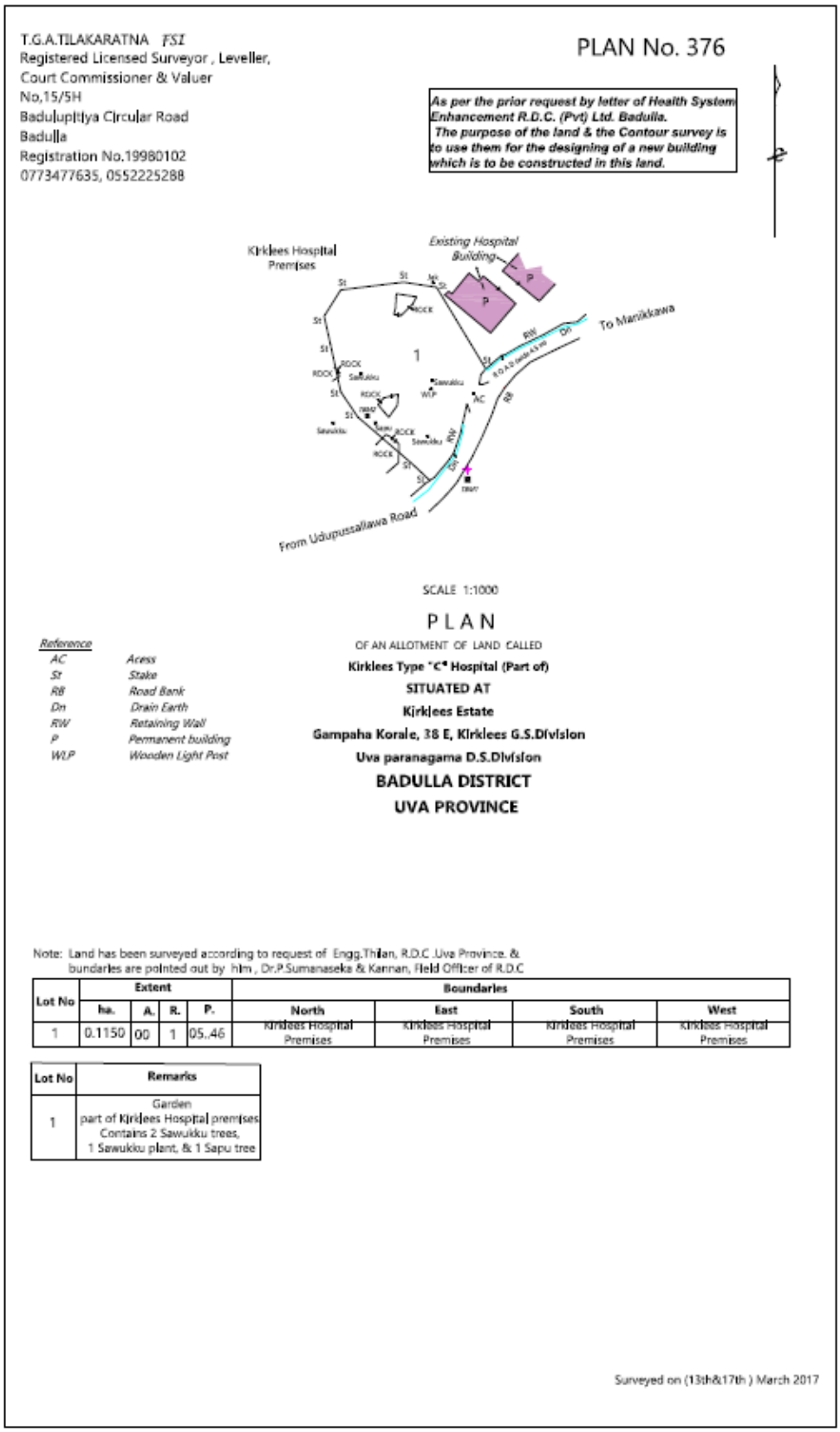
The location proposed for the new building in the hilly terrain and the car porch

The existing building and the site proposed for a new building located towards the hilly terrain

Existing septic tank located at an elevation of about 3 m above the adjacent concrete road

Rainwater is directly directed to the concrete road located in the front

Figure 3.18: Location-specific details at Carkeels DHC



T.G.A.TILAKARATNA FSI
Registered Licensed Surveyor , Leveller,
Court Commissioner & Valuer
No.15/5H
Badulupitiya Circular Road
Badulla
Registration No.19980102
0773477635, 0552225288

PLAN No. 376

As per the prior request by letter of Health System Enhancement R.D.C. (Pvt) Ltd. Badulla. The purpose of the land & the Contour survey is to use them for the designing of a new building which is to be constructed in this land.

SCALE 1:1000

PLAN

OF AN ALLOTMENT OF LAND CALLED

Kirklees Type "C" Hospital (Part of)

SITUATED AT

Kirklees Estate

Gampaha Korale, 38 E, Kirklees G.S.Division

Uva paranagama D.S.Division

BADULLA DISTRICT

UVA PROVINCE

Reference

AC	*Acess*
St	*Stake*
RB	*Road Bank*
Dn	*Drain Earth*
RW	*Retaining Wall*
P	*Permanent building*
WLP	*Wooden Light Post*

Note: Land has been surveyed according to request of Engg.Thilan, R.D.C .Uva Province. & bundaries are pointed out by him , Dr.P.Sumanaseka & Kannan, Field Officer of R.D.C

Lot No	Extent				Boundaries			
	ha.	A.	R.	P.	North	East	South	West
1	0.1150	00	1	05..46	Kirklees Hospital Premises	Kirklees Hospital Premises	Kirklees Hospital Premises	Kirklees Hospital Premises

Lot No	Remarks
1	Garden part of Kirklees Hospital premises Contains 2 Sawukku trees, 1 Sawukku plant, & 1 Sapu tree

Surveyed on (13th&17th) March 2017

Figure 3.19: Survey Plan of the Carkeels DHC

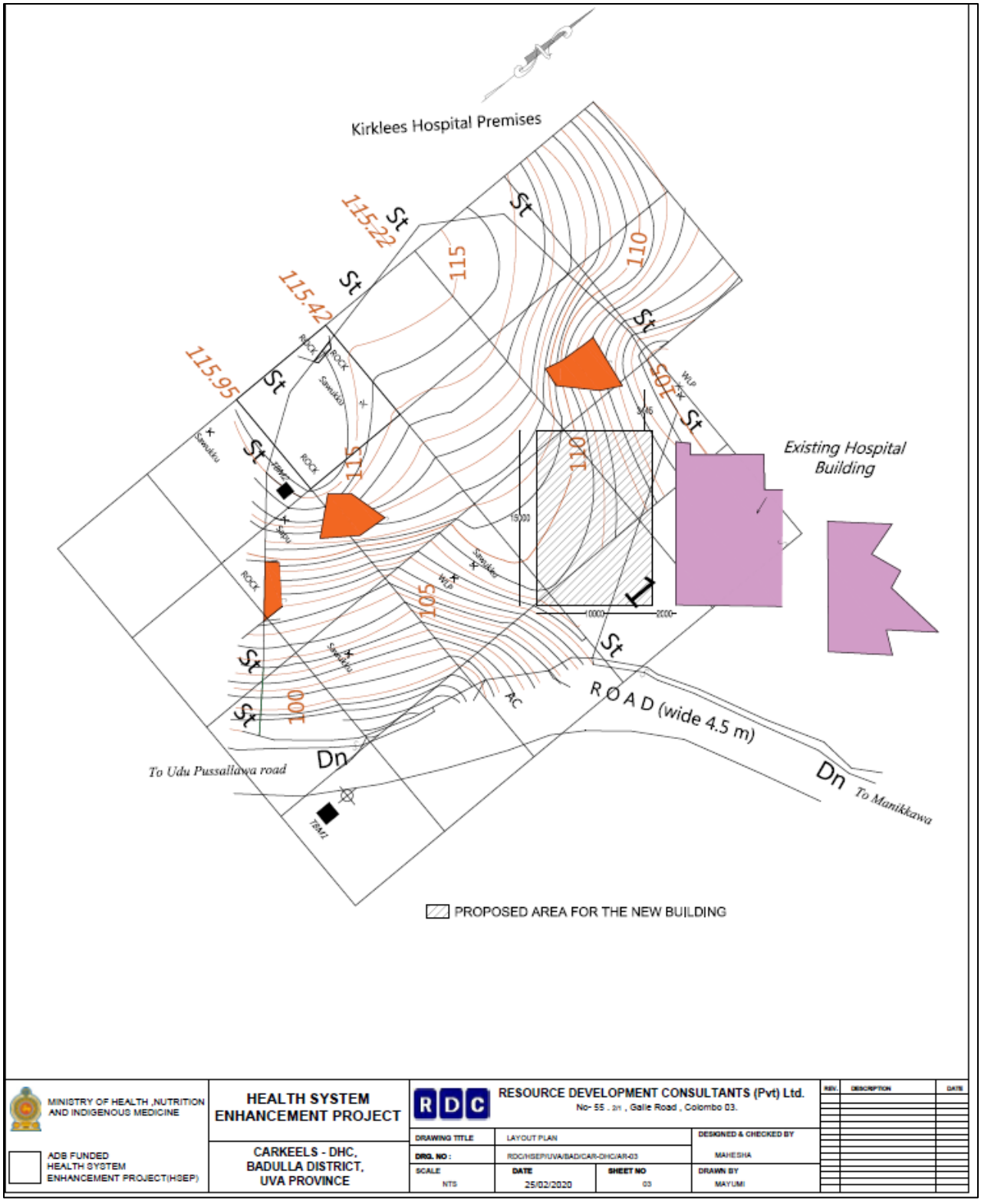


Figure 3.20: Location and Layout of new construction works proposed for Carkeels DHC

A2.5 HAPUTALE DHB

A.2.5.1 Location and Existing condition

Table 3.12: Location details of Haputale DHB

Province	Uva
District	Badulla
DS Division	Haputale
Local Authority	Haputale UC/PS
GN Division	63M Panketiya

98. The location map of Haputale DH is shown in Figure 3.21.

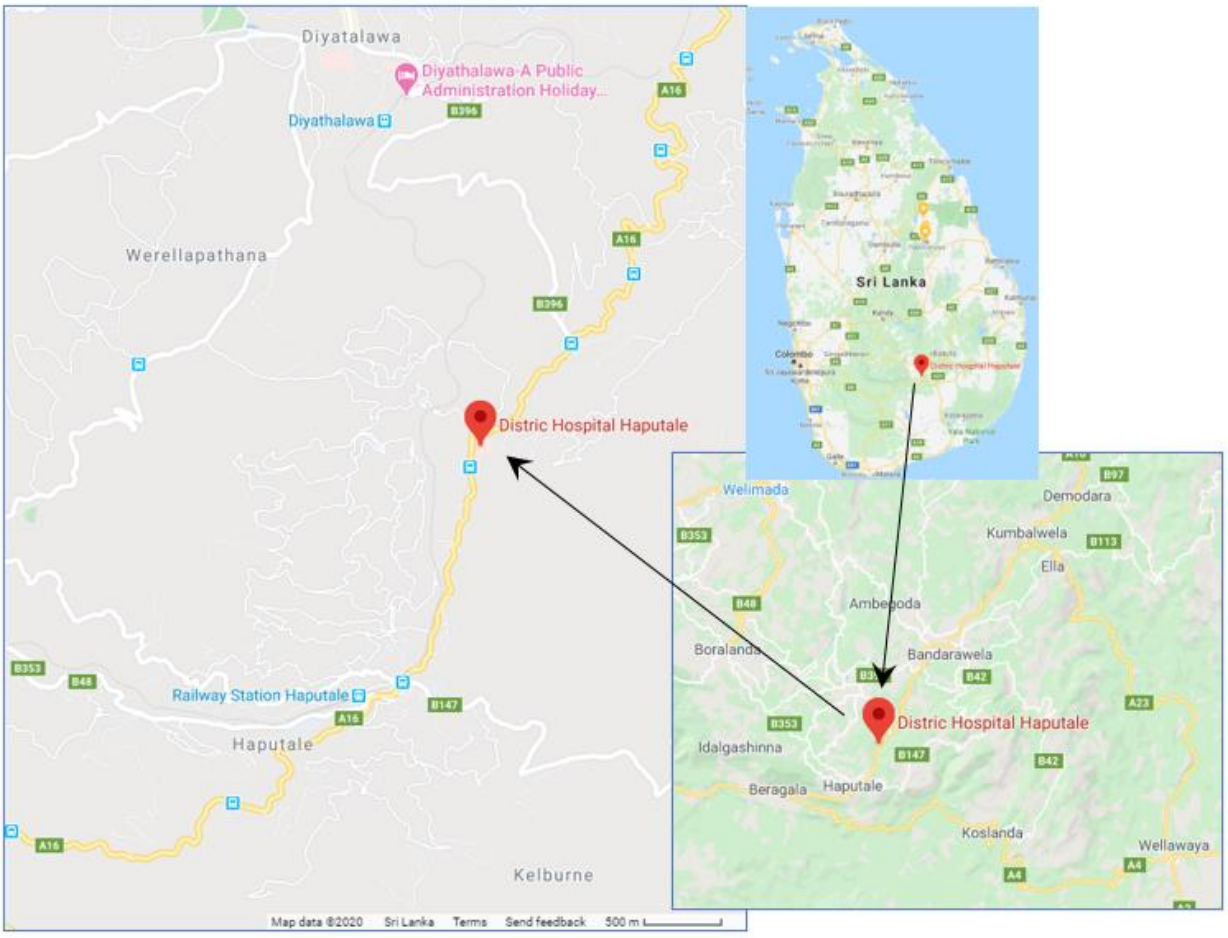
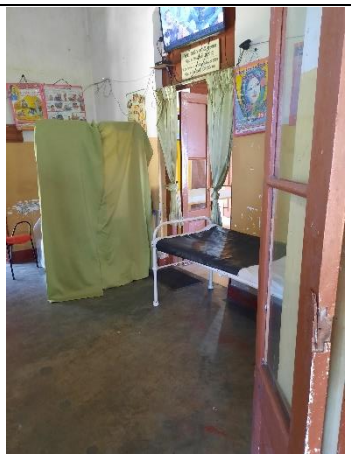


Figure 3.21: Location map of Haputale DH (6°46'58.63"N, 80°57'52.74"E)

99. Haputale Divisional Hospital is located by the side of A16 Beragala-Haputale-Bandarawela-Hali Ela road about 2 km from Haputale Town towards Bandarawela. Haputale Kelliebedda tea factory is located about 300 m towards Haputale. B/Haputale Muslim Vidyalaya is located in the close proximity of the DH (about 200 m). The land belonging to the DH is a large extent of land about 2 acres and is undulating with moderate-steep slopes towards the eastern side. The hospital is about 155 years old, and history goes back to about 1865.

Minimal **space for the OPD waiting area**

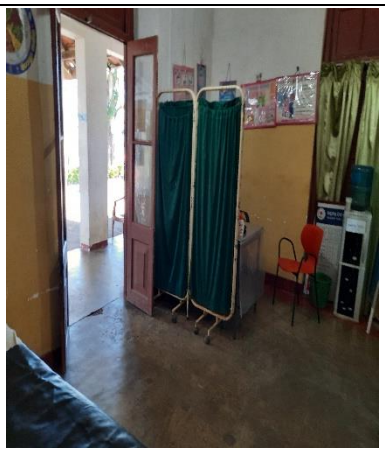
Small space used as the pharmacy



Restricted areas are used as the consultation rooms

Limited space available for NCD clinic

The d**rug store is damp and small**



Consultation area not properly organized

Figure 3.22: Existing condition of the facilities available at the Haputale DH

Table 3.13: Number of patients used the hospital facilities in 2018

No. of wards	5
No. of Beds	57
No. of outdoor patients	47,045
No. of indoor patients	3,555
Clinics	
- Medical	Twice a week (No. of patients: 140–160 per week)
- NCD/Diabetes	Twice a week (No. of patients: 75–100 per week)
- Chest	Twice a month (No. of patients: 50–60 per month)
- Pre- and ani-natal	Once a month (No. of patients: 75–100 per week)

Source: Department of Census and Statistics - Statistical Handbook, 2019

100. The following are the facilities available at the hospital: OPD, ETU, pharmacy, two male and three female wards, staff quarters (for doctors: one for the DMO and two for other MOs, nurses: the building is in a dilapidated state and not used), a non-functional mortuary, and other related facilities.

A.2.5.2 Need for sub-project

101. From the stakeholder consultations, it was found that the OPD and the ETU sections are very crowded, during OPD hours and clinic days. The facilities available for the patients are not sufficient, especially waiting areas, disabled access, washroom facilities, etc. Space availability for general services such as the reception area, patients' registration area, record-keeping areas, dispensary, pharmacy, etc. are also inadequate. The facilities available for healthcare has to be further developed for a better and efficient service.

Table 3.14: GN Divisions within the catchment and the population (2018)

GN Division	Male	Female	Total
Haputale DS Division			
63M Panketiya	1,830	1,215	3,045
63L Magiripura	1,240	1,132	2,372
63A Haputale Town	2,256	2,091	4,347
63P Kolatenna	280	281	561
63C Haputalegama	889	846	1,735
63I Hela Kadurugamuwa	887	798	1,685
63 Pahala Kadurugamuwa	1,215	1,071	2,286
63F Viharakele	842	649	1,491
63H Umankadura	1,048	1,041	2,089
63G Dodamwatta	1,025	910	1,962
64 Kahagolla	1,206	1,118	2,324
64D Pita Rathmale	1,645	1,594	3,939
63N Thotalagala	694	643	1,337
64E Galkanda	972	832	1,804
Haldummulla DS Division			
155E Moraketiya	286	306	592
155 Nikapotha East	391	379	770
155L Nikapotha West	141	143	284
157B Beragala	1,316	1,510	2,826
Yahalabedda			

Source: Sampath Pethikada of the respective Divisional Secretariats (2018)

102. From Table 3.14, it is clear that the patient visits to the hospital in 2018 were nearly 30,000, and the catchment areas have a population of about 20,000. To reap the maximum benefits out of the health-sector reforms proposed under the HSEP, it is essential that facilities of the DH be developed, of which construction of the following buildings are needed, as detailed in A2.5.3.

A.2.5.3 Proposed tasks/interventions at Haputale DHB

103. The following civil works are proposed for Haputale DHB.

- Construction of new building (See Figure 3.23)
- Earth cutting and filling (See Figure 3.23)
- Altering drainage path (See Figure 3.23) and construction of new drains
- Construction of new soakage pit & septic tank

The land proposed for the new building – the view from the hospital compound

The concrete road which is the access to the proposed site

The new toilet and the old drainage line located adjacent to the proposed land

The bare land where the new building is proposed

Figure 3.23: Location-specific details at Haputale DHB

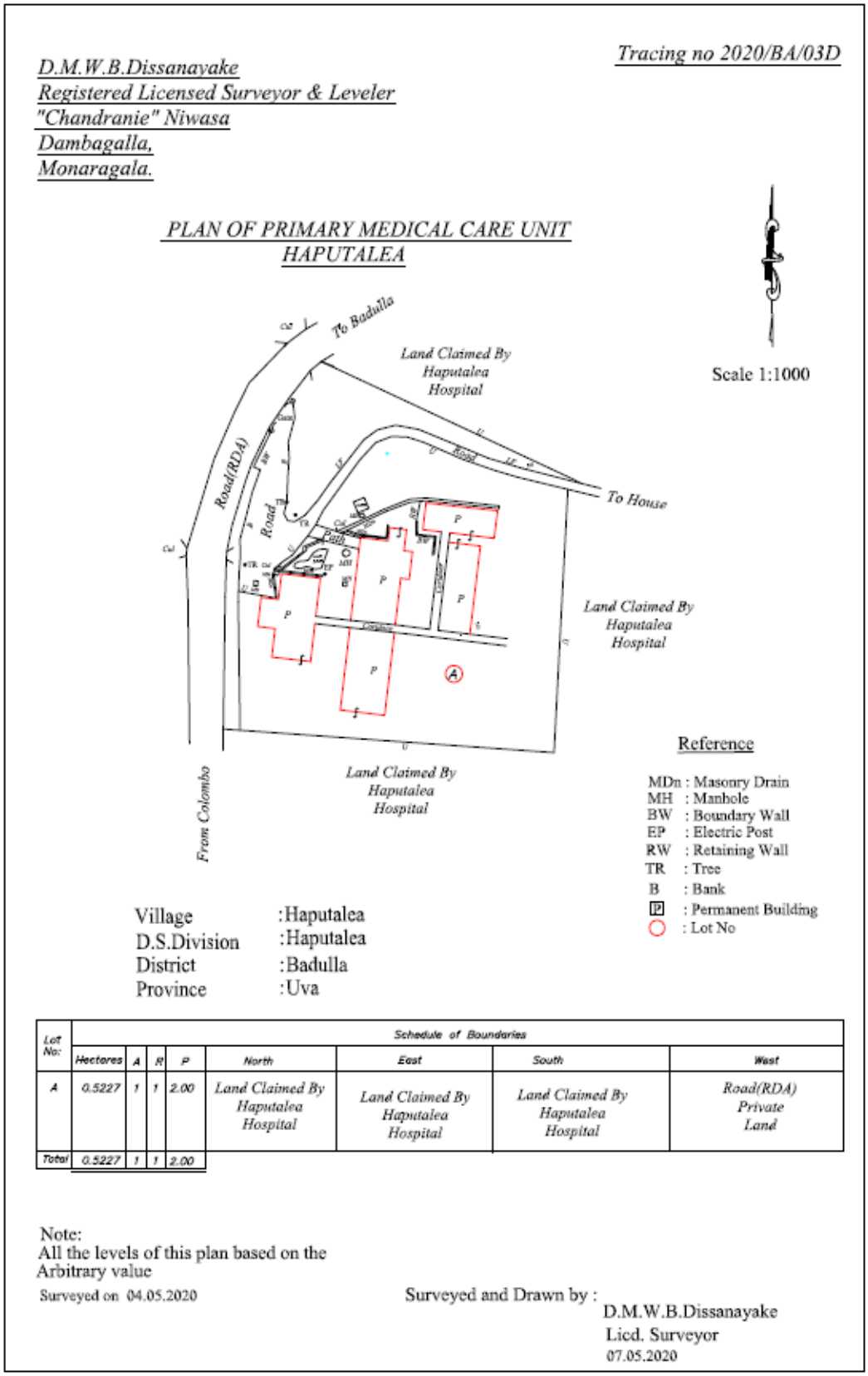


Figure 3.24: Survey Plan of the Haputale DHB Premises

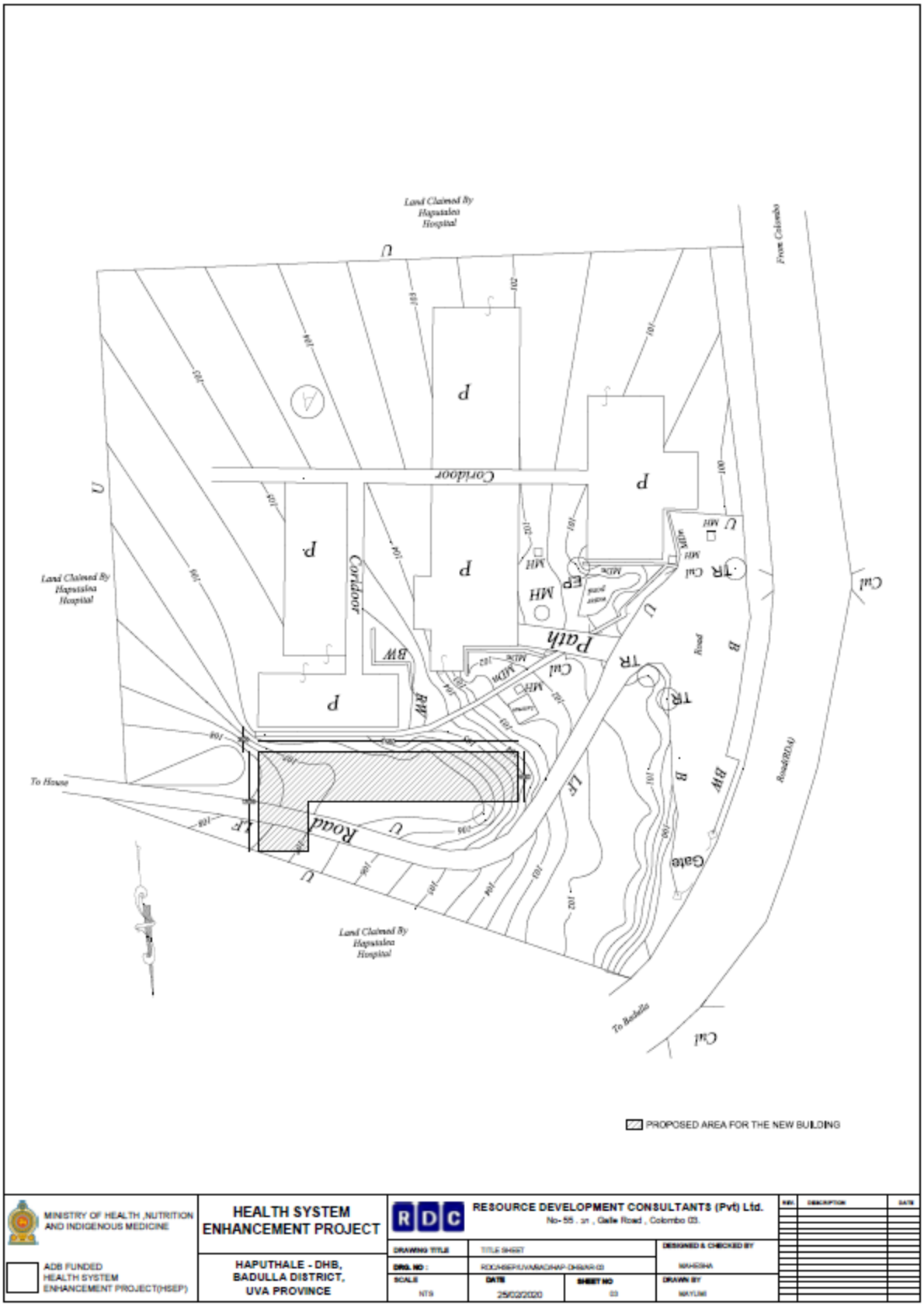


Figure 3.25: Locations & Layout of new construction works proposed for Haputale DHB

B Sub-projects in Monaragala District

B.1 Location of the sub-projects

104. In Monaragala District, sub-projects for five healthcare centres have been proposed under Round 2 Phase 1 of the HSEP. These five healthcare centres are shown in Figure 3.3, and the sub-project details are provided in Section B.2.

B.2 Existing Condition, Need for each sub-project & Proposed Components

B.2.1 KOTAGAMA PMCU

B.2.1.1 Location and Existing condition

Table 3.15: Location details of Kotagama PMCU

Province	Uva
District	Monaragala
DS Division	Bibile
Local Authority	Bibile PS
GN Division	97 Kotagama

105. The location map of Kotagama PMCU is shown in Figure 3.26.

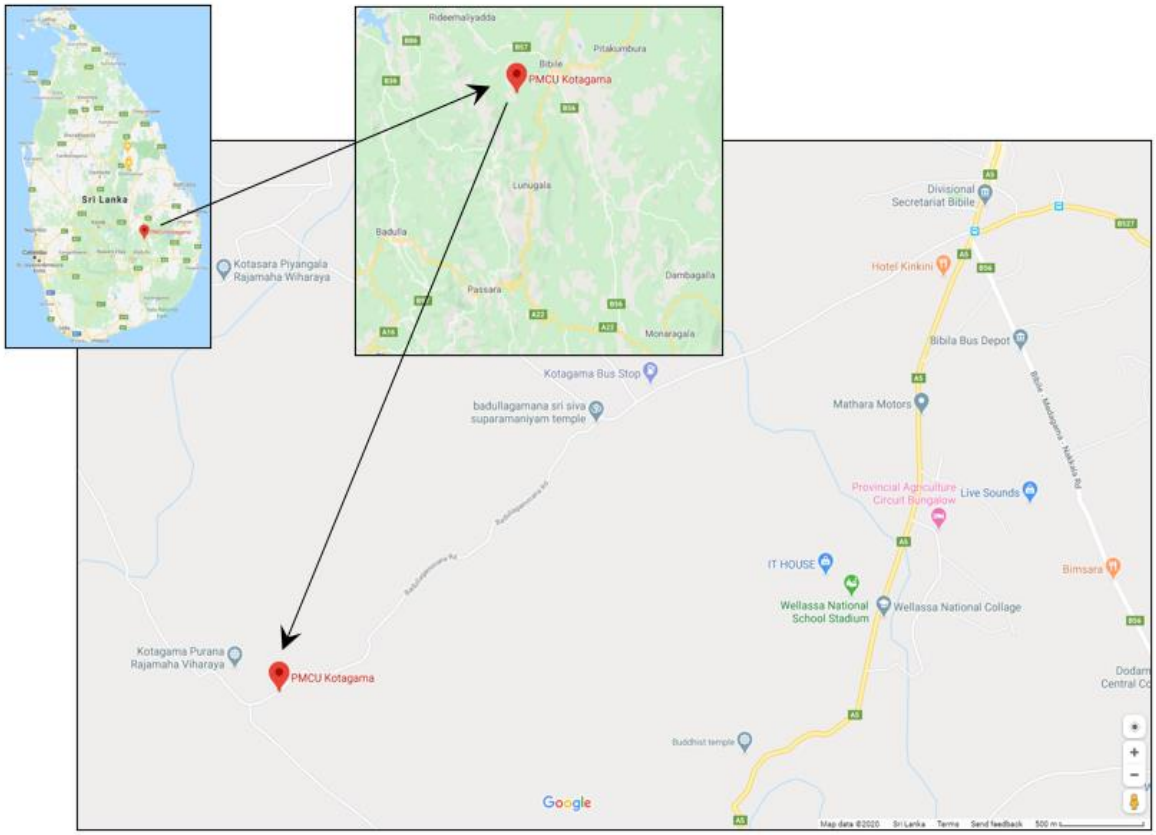
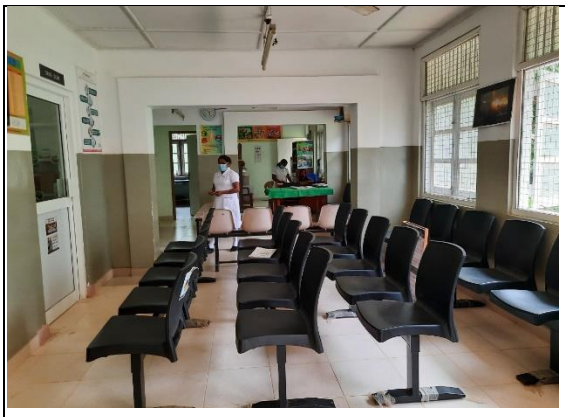
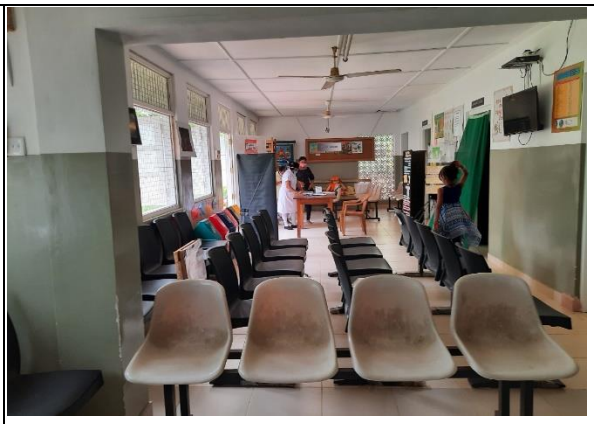


Figure 3.26: Location map of Kotagama PMCU (7° 7'51.57"N 81°11'10.00"E)

106. Kotagama PMCU is located about 200 m from Kotagama Junction (on B46 Yalkumbura-Ridimaliyedda Road) on Badullagammana-Bibile Road and is about 6.2 km from Bibile Town. The land is slightly sloping towards southeasterly to northwest direction. The areas are sparsely populated, and the area towards the back of the hospital premises is covered with vegetation and large trees. Kotagama Purana Raja Maha Viharaya is located within 500 m from the hospital premises. The extend of the land of the hospital premises is 00A 02R 23.3P.



OPD Area



Clinic area

OPD Area

Dispensary Area

Reception area

Only toilet available for patients

Figure 3.27: Existing condition of the facilities available at the Kotagama PMCU

107. The following are the facilities available at the hospital: OPD, staff quarters (for the MOIC), drug store, dressing room, consultation room, pantry, and other related facilities.

Table 3.16: Number of patients used the hospital facilities in 2018

No. of wards	-
No. of Beds	-
No. of outdoor patients	Annual: 10,706
No. of indoor patients	-
Clinics - Medical - NCD/Diabetes - Pre- and ani-natal	 Twice a week Twice a week Once a month

Source: Department of Census and Statistics - Statistical Handbook, 2018 and Data provided by the PMCU

B.2.1.2 Need for sub-project

108. From the stakeholder consultations, it was found the OPD and the Clinic sections are very crowded, during OPD hours and clinic days. The facilities available for the patients are not sufficient, especially waiting areas, disabled access, washroom facilities, etc. Space availability for general services such as the reception area, patients' registration area, record-keeping areas, drug store, etc. are also inadequate. There are no ETU and dental clinic. The facilities available for healthcare has to be further developed for a better and efficient service. There is no parking area for the PMCU.

Table 3.17: GN Divisions within the catchment and the population (2018)

GN Division	Female	Male	Total
Bibile DS Division			
97 Kotagama	550	530	1080
98B Mudiyala	550	520	1070
97A Egoda Kotagama	425	396	821
102G Udumallehewa	529	458	987
100F Badullagammana	961	919	1880
100A Kuruwamba	622	603	1225
100E Hewelwela	495	485	980
102B Mallehewa	731	512	1243
98 Yalkumbura	449	397	846

Source: Sampath Pethikada of the respective Divisional Secretariats (2018)

109. From Table 3.17, it is clear that the patient visits to the hospital in 2018 were nearly 11,000, and the catchment areas have a population of about 14,000. To reap the maximum benefits out of the health-sector reforms proposed under the HSEP, it is essential that facilities of

the divisional hospital be developed, of which construction of the following buildings are needed, as detailed in B2.1.3.

B.2.1.3 Proposed tasks/interventions at Kotagama PMCU

110. The following civil works are proposed for Kotagama PMCU.

- Construction of new building (See Figure 3.30) for Dental unit, ETU, and clinics
- Demolition of small parts of an existing building (See Figure 3.28)
- Earth cutting and filling for foundations
- Altering drainage path (See Figure 3.28) and construction of new drains
- Construction of new soakage pit & septic tank (See Figure 3.28 for existing septic tank)

The proposed site is located at a lower elevation

The rainwater drains should be replaced

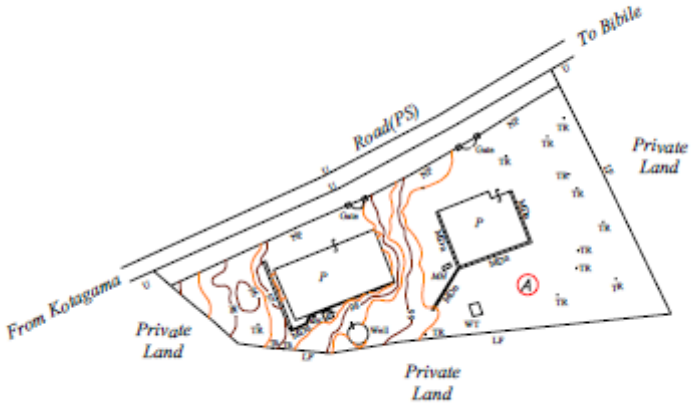
The existing septic tank

Figure 3.28: Location-specific details at Kotagama PMCU site

D.M.W.B.Dissanayake
Registered Licensed Surveyor & Leveler
"Chandranie" Niwasa
Dambagalla,
Monaragala.

Tracing no 2020/MO/02

CONTOUR PLAN OF PRIMARY MEDICAL CARE UNIT KOTAGAMA



Scale 1:1000
Contour Interval : 0.5 m

Village :Kotagama
Minor Division :Wegampaththuwa
D.S.Division :Bibile
District :Monaragala
Province :Uva

Reference

MDn : Masonry Drain
MH : Manhole
NF : Net Fence
LF : Live Fence
WT : Water Tank
TR : Tree
Road(PS) : Road(Pradeshiya Sabha)
P : Permanent Building
◯ : Lot No

Lot No:	Schedule of Boundaries							
	Hectares	A	R	P	North	East	South	West
A	0.2613	0	2	23.30	Road(PS)	Private Land	Private Land	Private Land
Total	0.2613	0	2	23.30				

Note:
All the levels of this plan based on the Arbitrary value

Surveyed on 10.03.2020

Surveyed and Drawn by :
D.M.W.B.Dissanayake
Licd. Surveyor
12.03.2020

Figure 3.29: Survey Plan of the Kotagama PMCU Premises

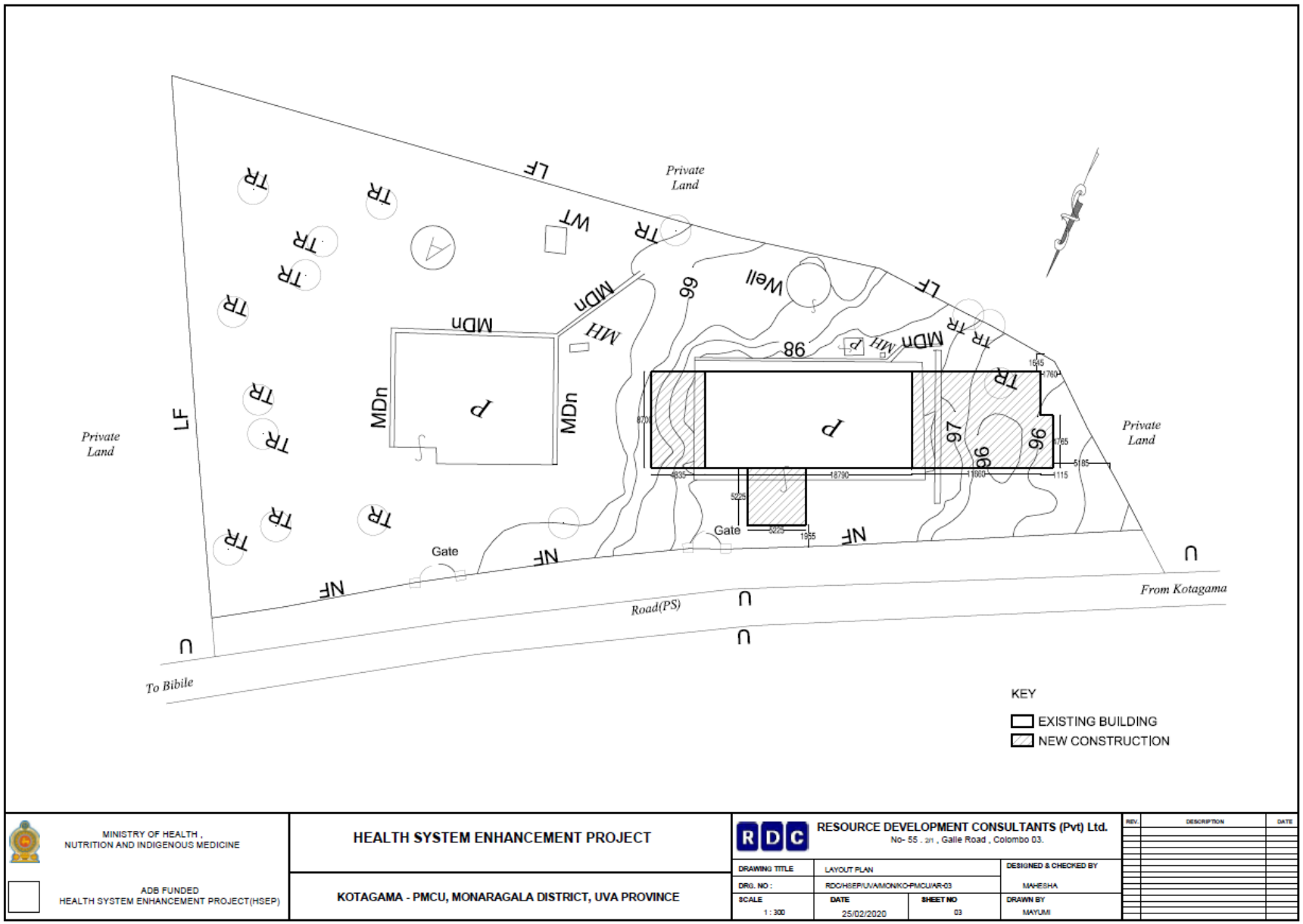


Figure 3.30: Location and Layout of new construction works proposed for Kotagama PMCU

B.2.2 PITAKUMBURA DHC

B.2.2.1 Location and Existing condition

Table 3.18: Location details of Pitakumbura DHC

Province	Uva
District	Monaragala
DS Division	Bibile
Local Authority	Bibile PS
GN Division	101A Pitakumbura

111. The location map of Pitakumbura DH is shown in Figure 3.31.

Figure 3.31: Location map of Pitakumbura DH (7°10'47.34"N 81°17'33.78"E)

112. Pitakumbura Divisional Hospital is located by the side of the B527 Bibile-Pita Kumbura-Namal Oya-Inginiyagala Road. It is located about 200 m towards Inginiyagala from Pita Kumbura Junction on B527 near Jayawardhana Aththanayake Navodya School. The area is almost flat terrain and is sparsely populated. Much of the land towards hinterland away from the main road is shrubland and forested areas. The land that belongs to the hospital is about 01A 00R 04.00P.

113. There are two doctors' quarters located on one side of the hospital premises. Also, there is a separate newly constructed building for Suwa Divi Sahanaya, where there is a small auditorium.

OPD Area

Clinic area

Dispensary area

ETU

Male ward

Female ward

Figure 3.32: Existing condition of the facilities available at the Pitakumbura DH

114. The following are the facilities available at the hospital: OPD, ETU, pharmacy, male and female wards, staff quarters (for doctors: 02, nurses), mortuary, and other related facilities.

Table 3.19: Number of patients used the hospital facilities in 2018

No. of wards	3
No. of Beds	17
No. of outdoor patients	23,202
No. of indoor patients	1,261
Clinics - Medical - NCD/Diabetes - Pre- and ani-natal	 Twice a week (No. of patients: 100–120 per week) Twice a week (No. of patients: 30–40 per week) Once a month (No. of patients: 30–35 per week)

Source: Department of Census and Statistics - Statistical Handbook, 2018 and Data provided by the PMCU

B.2.2.2 Need for sub-project

115. From the stakeholder consultations, it was found the OPD and the ETU sections are very crowded, during OPD hours and clinic days. The facilities available for the patients are not sufficient, especially waiting areas, disabled access, washroom facilities, etc. Space availability for general services such as the reception area, patients' registration area, record-keeping areas, dispensary, pharmacy, etc. are also inadequate. The facilities available for healthcare has to be further developed for a better and efficient service.

Table 3.20: GN Divisions within the catchment and the population (2018)

GN Division	Male	Female	Total
Bibile DS Division			
101A Pitakumbura	622	618	1,240
130A Hamapola	620	575	1,195
130C Thotillaketiya	537	523	1,060
101D Kokunnewa	565	597	1,162
101 Bokagonna	834	789	1,590
102F Kanawegalla	269	253	522
103 Nilgala	459	470	929
102A Radaliyadda	637	654	1,291
101B Nagala	854	836	1,690
103D Karandugala	393	376	769
Madulla DS Division			
104C Galgamuwa	656	642	1,298
104B Nelliyadda	257	261	518
104 Mullegama	532	507	1,039

Source: Sampath Pethikada of the respective Divisional Secretariats (2018)

From Table 3.20, it is clear that the patient visits to the hospital in 2018 were nearly 23,200, and

the catchment areas have a population of about 10,000. To reap the maximum benefits out of health-sector reforms proposed under HSEP, it is essential that facilities of the divisional hospital be developed, of which construction of the following buildings are needed, as detailed in B2.2.3.

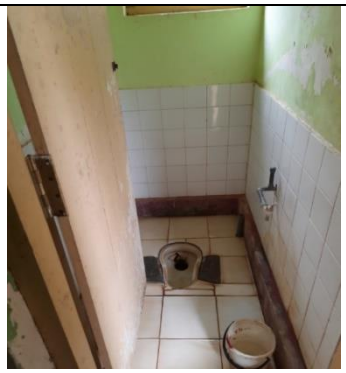
B.2.2.3 Proposed tasks/interventions at Pitakumbura DHC

116. The following civil works are proposed for Pitakumbura DHC.

- Construction of new building (See Figure 3.33)
- Demolition of part of existing building and renovation of wards and roof (Figure 3.33)
- Earth cutting and filling (See Figure 3.33)
- Altering drainage path (See Figure 3.33) and construction of new drains
- Construction of new soakage pit & septic tank

The roof and ceiling needs renovation

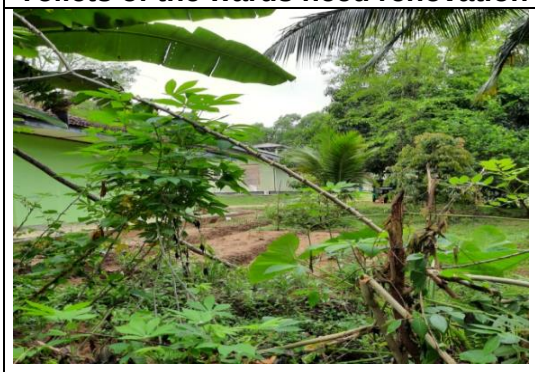
Wall of the ward areas are cracked



Toilets of the wards need renovation

The building needs extensive renovation

The



New access road for the ambulance

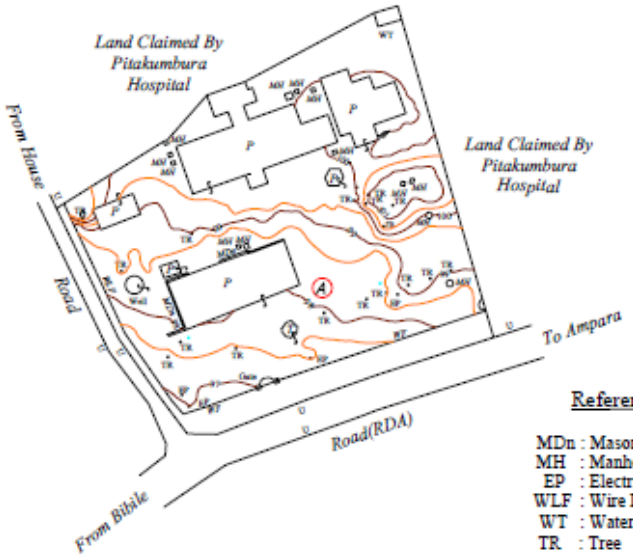
Rainwater drains needs alterations

Figure 3.33: Location-specific details at Pitakumbura DHC site

D.M.W.B.Dissanayake
Registered Licensed Surveyor & Leveler
"Chandranie" Niwasa
Dambagalla,
Monaragala.

Tracing no 2020/MO/01

CONTOUR PLAN OF PRIMARY MEDICAL CARE UNIT PITAKUMBURA



Scale 1:1000
Contour Interval : 0.5 m

Reference

MDn : Masonry Drain
MH : Manhole
EP : Electric Post
WLF : Wire Live Fence
WT : Water Tank
TR : Tree
Road(RDA) : Road(Road Development Authority)
: Permanent Building
: Temporary Building
: Lot No

Village :Pitakumbura
Minor Division :Wegampaththuwa
D.S.Division :Bibile
District :Monaragala
Province :Uva

Lot No:	Schedule of Boundaries							
	Hectares	A	R	P	North	East	South	West
A	0.4148	1	0	4.00	Land Claimed By Pitakumbura Hospital	Land Claimed By Pitakumbura Hospital	Road(RDA)	Road
Total	0.4148	1	0	4.00				

Note:
All the levels of this plan based on the Arbitrary value

Surveyed on 10.03.2020

Surveyed and Drawn by :
D.M.W.B.Dissanayake
Licd. Surveyor
12.03.2020

Figure 3.34: Contour Plan of the Pitakumbura DHC Premises

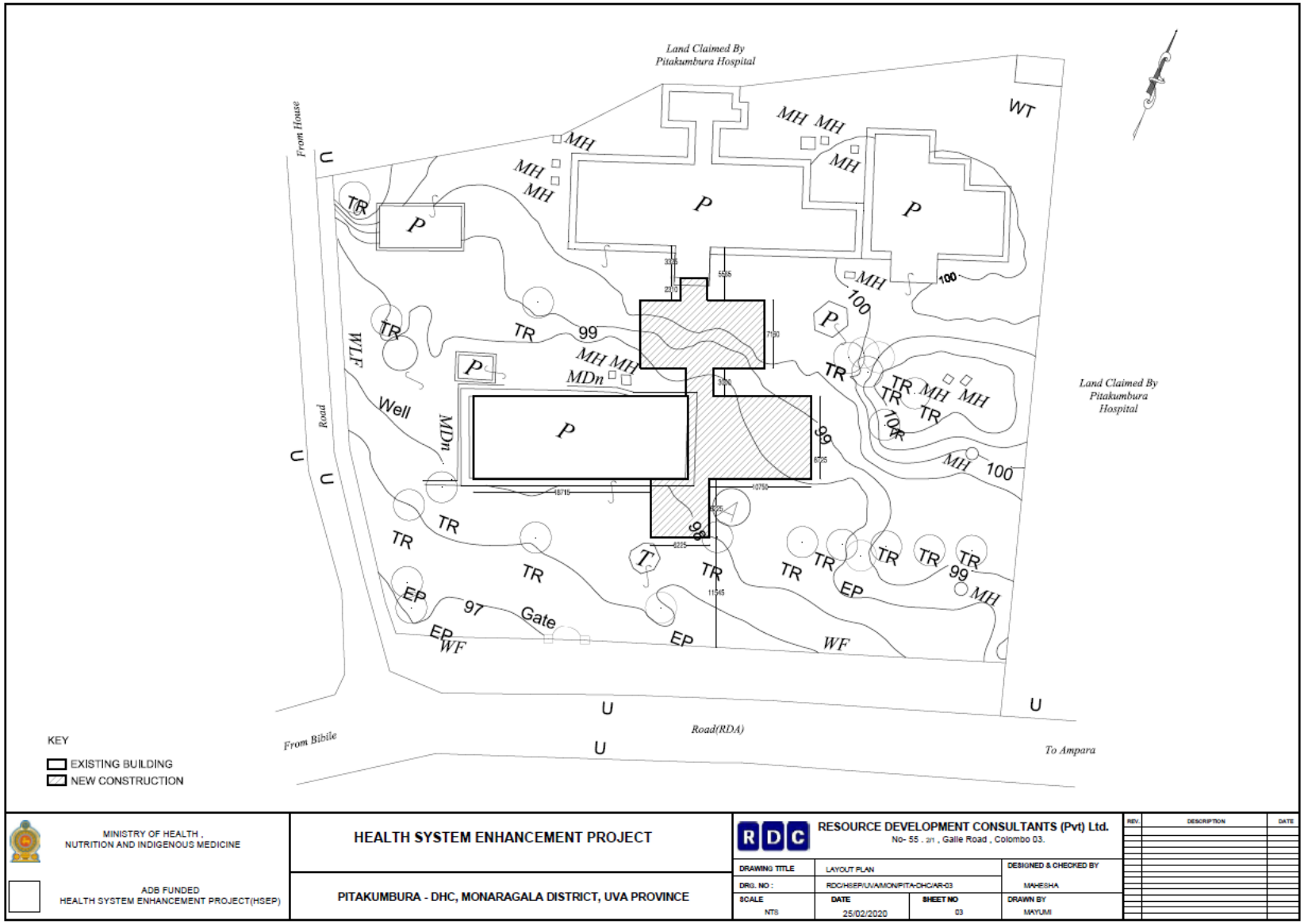


Figure 3.35: Locations and Layout of new construction works proposed for Pitakumbura DHC

B2.3 Medagama DHB

B.2.3.1 Location and Existing condition

Table 3.21: Location details of Medagama DHB

Province	Uva
District	Monaragala
DS Division	Medagama
Local Authority	Medagama PS
GN Division	110D Medagama

117. The location map of Medagama DH is shown in Figure 3.36.

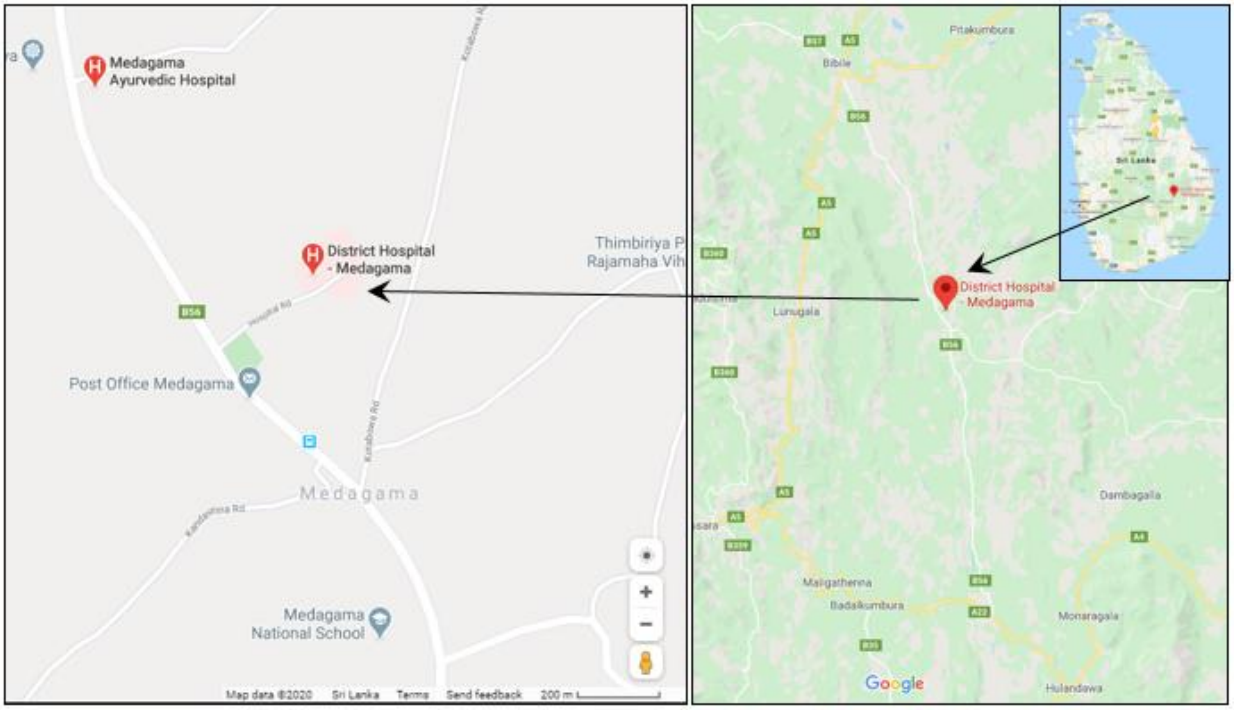


Figure 3.36: Location map of Medagama DH (7° 2'20.96"N 81°16'29.84"E)

118. Medagama Divisional Hospital is located on the Bibile-Medagama-Nakkala Road (B56), about 500 m towards Nakkala from Medagama Junction. The hospital can be accessed through the Hospital Road, which is a byroad of B56. There are home gardens and paddy fields in the vicinity. Medagama National School, Medagama Technical College, Medagama Post Office, and Medagama Pradeshiya Sabha are located within the 500 m perimeter. There is a public ground (Gunasekara Grounds) nearby.

119. The land that belongs to the hospital is vast and is about 20 acres. Much of the land is covered with vegetation and large trees. The land is flat; however, some parts may get soggy during rains.

OPD Area

Clinic area and reception

Waiting area for patients located outside the building

Entrance porch to the building without proper access to wheeled conveyance

The frontal area of the building

Figure 3.37: Existing condition of the facilities available at the Medagama DH

120. The following are the facilities available at the hospital: OPD, clinics for medical and NCD/diabetes, clinics for ante- and post-natal patients, ETU, pharmacy, laboratory, dental clinic, 02 male and 03 female wards, staff quarters (for doctors: 02, nurses: 01), mortuary (non-functioning), and other related facilities. Children's' ward is located at the two-storied building earmarked for renovation, which will be shifted to the female ward.

Table 3.22: Number of patients used the hospital facilities in 2018

No. of wards	5
No. of Beds	77 (occupancy 30–40%)
No. of outdoor patients	59,789 (Ave. 200–205 per day)
No. of indoor patients	4,460
Clinics	
- Medical	Three times a week (No. of patients: 180–200 per week)
- NCD/Diabetes	Once a week (No. of patients: 20–25 per week)
- Pre- and ani-natal	Twice a month (No. of patients: 35–40 per week)

Source: Department of Census and Statistics - Statistical Handbook, 2018 and Data provided by the PMCU

B.2.3.2 Need for sub-project

121. From the stakeholder consultations, it was found that the OPD and the ETU sections are very crowded, during OPD hours and clinic days. The facilities available for the patients are not sufficient, especially waiting areas, disabled access, washroom facilities, etc. Space availability for general services such as the reception area, patients' registration area, record-keeping areas, dispensary, pharmacy, etc. are also inadequate. The facilities available for healthcare has to be further developed for a better and efficient service.

Table 3.23: GN Divisions within the catchment and the population (2018)

GN Division	Female	Male	Total
Medagama DS Division			
110D Medagama	829	801	1,630
110F Ilukkumbura	586	542	1,128
110I Kinnarabowa	416	404	820
110B Pitadeniya	430	441	871
109A Elhena	519	515	1,034
109B Nugamura	502	476	978
108B Diviyapola	271	253	524
108C Dahagoniya	549	547	1,096
108A Monarawana	746	669	1,415
111B Mellagama	790	698	1,488
110E Thimbiriya	913	898	1,811
110A Bakinigahawela	778	762	1,540
Lunugala DS Division			
92 Pallekiruwa	366	416	782
92B Weragoda	159	177	336

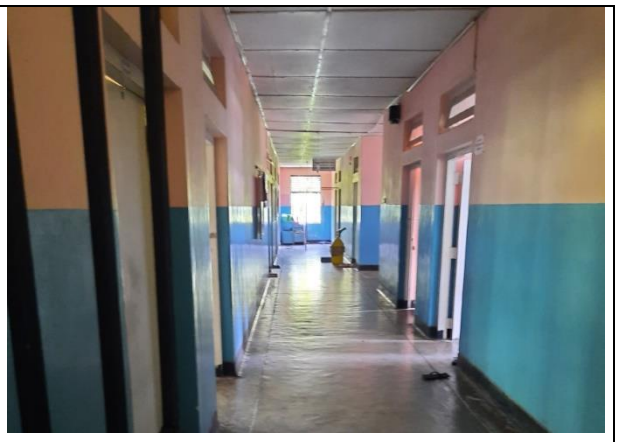
Source: Sampath Pethikada of the respective Divisional Secretariats (2018)

122. From Table 3.24, it is clear that the patient visits to the hospital in 2018 was nearly 60,000, and the catchment areas have a population of about 20,000. To reap the maximum benefits out of the health-sector reforms proposed under the HSEP, it is essential that facilities of the divisional hospital be developed, of which construction of the following buildings are needed, as detailed in B2.3.3.

B.2.3.3 Proposed tasks/interventions at Medagama DHB

123. The following civil works are proposed for Medagama DHB.

- Renovation of existing buildings (see Figure 3.40)
- Demolition of internal walls and partitions (see Figure 3.38)
- Construction of new internal walls and partitions
- Renovation of the roof and the ceiling
- Shifting of children's ward located upstairs
- Altering drainage path and construction of new drains
- Construction of new soakage pit & septic tank



Some of the internal walls will be demolished

The two children's wards located upstairs will be shifted

Toilet block on both levels will be refurbished

Figure 3.38: Location-specific details at Medagama DHB site

B2.4 RATHMALGAHA ELLA PMCU

B.2.4.1 Location and Existing condition

Table 3.24: Location details of Rathmalgaha Ella PMCU

Province	Uva
District	Monaragala
DS Division	Madulla
Local Authority	Madulla PS
GN Division	104 Mullegama

124. The location map of Rathmalgaha Ella PMCU is shown in Figure 3.39.

Figure 3.39: Location map of Rathmalgaha Ella PMCU (7°19'52.81"N, 81°26'2.23"E)

125. Rathmalgaha Ella PMCU is located along B527 Bibile-Pita Kumbura-Namal Oya-Inginiyagala Road near Rathmalgaha Ela School. The land belonging to the PMCU is about 00A 02R 19.09P and is almost flat terrain. There is a canal running parallel to B527 between the road and the hospital.

OPD Area

Midwife's Clinic (MOH)

Dispensary area

Only toilet available for patients

Figure 3.40: Existing condition of the facilities available at the Rathmalgaha Ella DH: (a) OPD section, (b) OPD Section, (c) ETU section, (d) ETU section

126. The following are the facilities available at the hospital: OPD, staff quarters (for the MOIC), drug store, dressing room, consultation room, pantry, and other related facilities.

Table 3.25: Number of patients used the hospital facilities in 2018

No. of wards	-
No. of Beds	-
No. of outdoor patients	Annual: 6,614
No. of indoor patients	-
Clinics - Medical/Diabetes - NCD - Pre- and ani-natal	 Twice a week (patients: 200–220 per month) Twice a week (patients: 60–70 per month) Once a month (patients: 20–30 per month)

Source: Department of Census and Statistics - Statistical Handbook, 2018 and Data provided by the PMCU

B.2.4.2 Need for sub-project

127. From the stakeholder consultations, it was found that the OPD and the Clinic sections are very crowded, during OPD hours and clinic days. The facilities available for the patients are not sufficient, especially waiting areas, disabled access, washroom facilities, etc. Space availability for general services such as the reception area, patients' registration area, record-keeping areas, drug store, etc. are also inadequate. There are no ETU and dental clinic. The facilities available for healthcare has to be further developed for a better and efficient service. There is no parking area for the PMCU.

Table 3.26: GN Divisions within the catchment and the population (2018)

GN Division	Male	Female	Total
Madulla DS Division			
104C Galgamuwa	656	642	1,298
104B Nelliyadda	257	261	518
104 Mullegama	532	507	1,039

Source: Sampath Pethikada of the respective Divisional Secretariats (2018)

128. From Table 3.26, it is clear that the patient visits in 2018 was nearly 6,600, and catchment areas have a population of about 3,000. To reap the maximum benefits out of the health-sector reforms proposed under the HSEP, it is essential that facilities of the divisional hospital be developed, of which construction of the following buildings are needed, as detailed in B2.4.3.

B.2.4.3 Proposed tasks/interventions at Rathmalgaha Ella PMCU

129. The following civil works are proposed for Rathmalgaha Ella PMCU.

- Construction of new buildings (See Figure 3.43)
- Demolition of part of an existing building (See Figure3.41)
- Earth cutting and filling (See Figure 3.41)
- Altering drainage path (See Figure 3.41) and construction of new drains
- Construction of new soakage pit & septic tank (See Figure 3.41 for existing septic tank)

The section of the building to be demolished

The pro[posed site needs levelling

The rainwater drainage canals have to be altered

The soakage pits overflow during rainy days when the nearby canal flows full.

The gutters and downpipe connected to the rainwater harvesting tank has to be reconnected after the construction of the new extension

The solar panel needs relocation for construction of the access road

Figure 3.41: Location-specific details at Rathmalgaha Ella PMCU site

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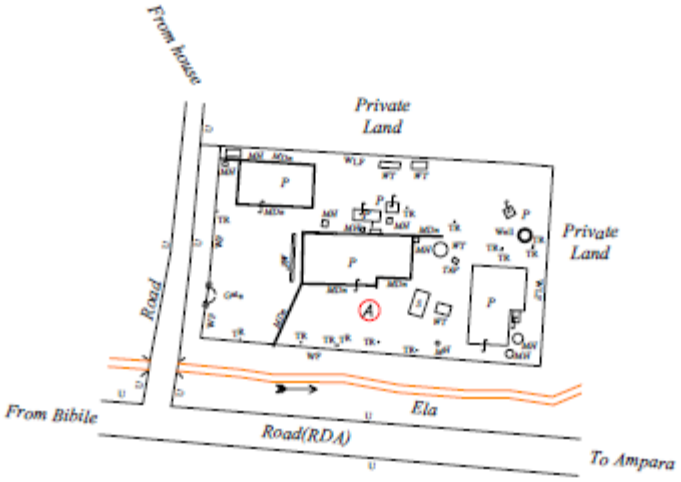
"Chandranie" Niwasa
Dambagalla,
Monaragala.

Tracing no 2020/MO/04

PLAN OF PRIMARY MEDICAL CARE UNIT RATHMALGAHAELLA



Scale 1:1000

Village :Rathmalgahaella
Minor Division :Wegampatthuwa Korale
D.S.Division :Madulla
District :Monaragala
Province :Uva

Reference

MDn : Masonry Drain
MH : Manhole
WF : Wire Fence
WLF : Wire Live Fence
WT : Water Tank
TR : Tree
Road(RDA) : Road(Road Development Authority)
S : Solar Panel
P : Permanent Building
◯ : Lot No

Lot No:	Schedule of Boundaries							
	Hectares	A	R	P	North	East	South	West
A	0.2506	0	2	19.09	Private Land	Private Land	Ela	Road
Total	0.2506	0	2	19.09				

Surveyed and Drawn by :
D.M.W.B.Dissanayake
Licd. Surveyor
12.03.2020

Surveyed on 10.03.2020

Figure 3.42: Contour Plan of the Rathmalgaha Ella PMCU Premises

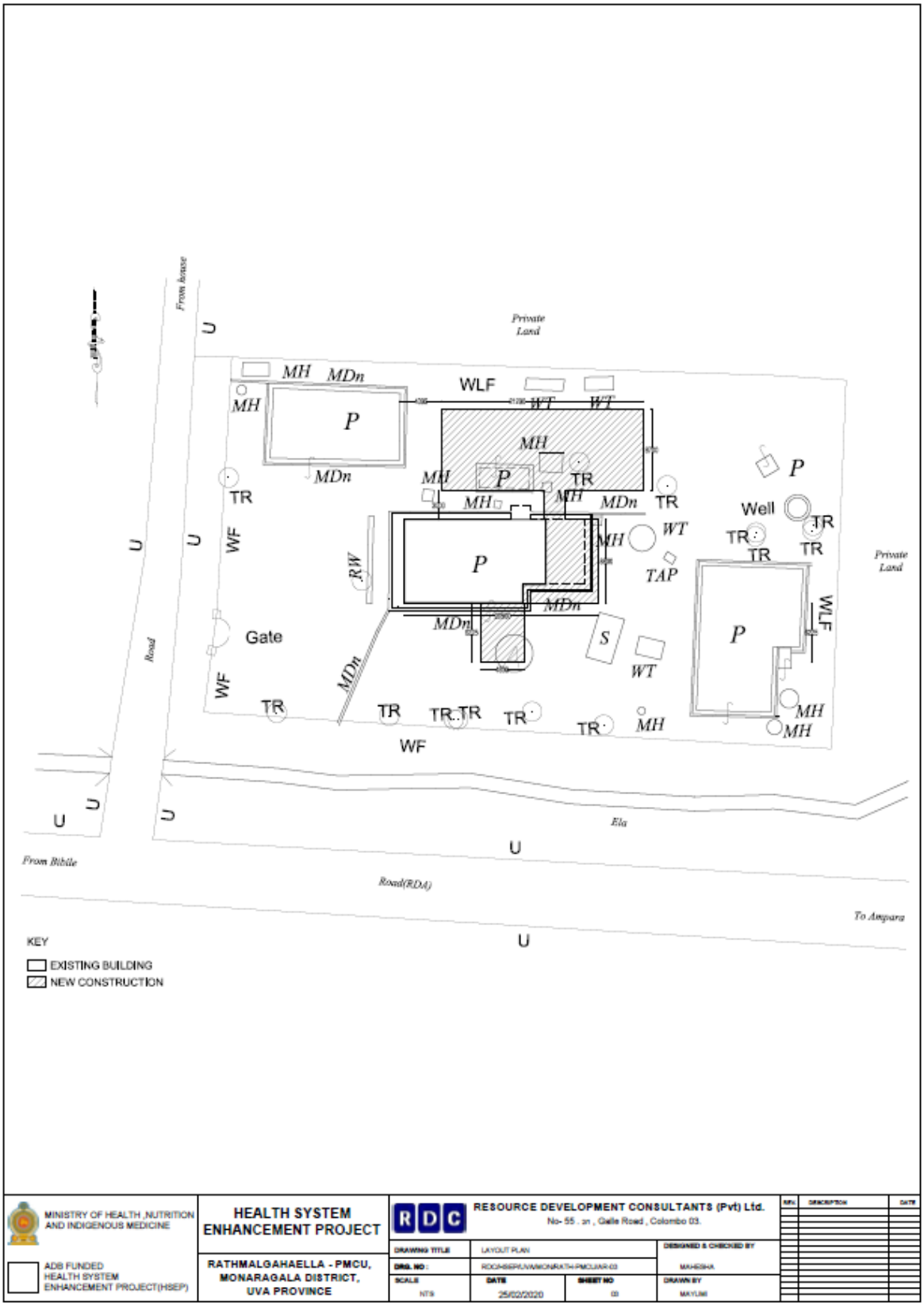


Figure 3.43: Locations and Layout of new construction works proposed for Rathmalgaha Ella PMCU

B2.5 NANNAPURAWA PMCU

B.2.5.1 Location and Existing condition

Table 3.27: Location details of Nannapurawa PMCU.

Province	Uva
District	Monaragala
DS Division	Medagama
Local Authority	Medagama PS
GN Division	106 Nannapurawa

130. The location map of Nannapurawa PMCU is shown in Figure 3.44.

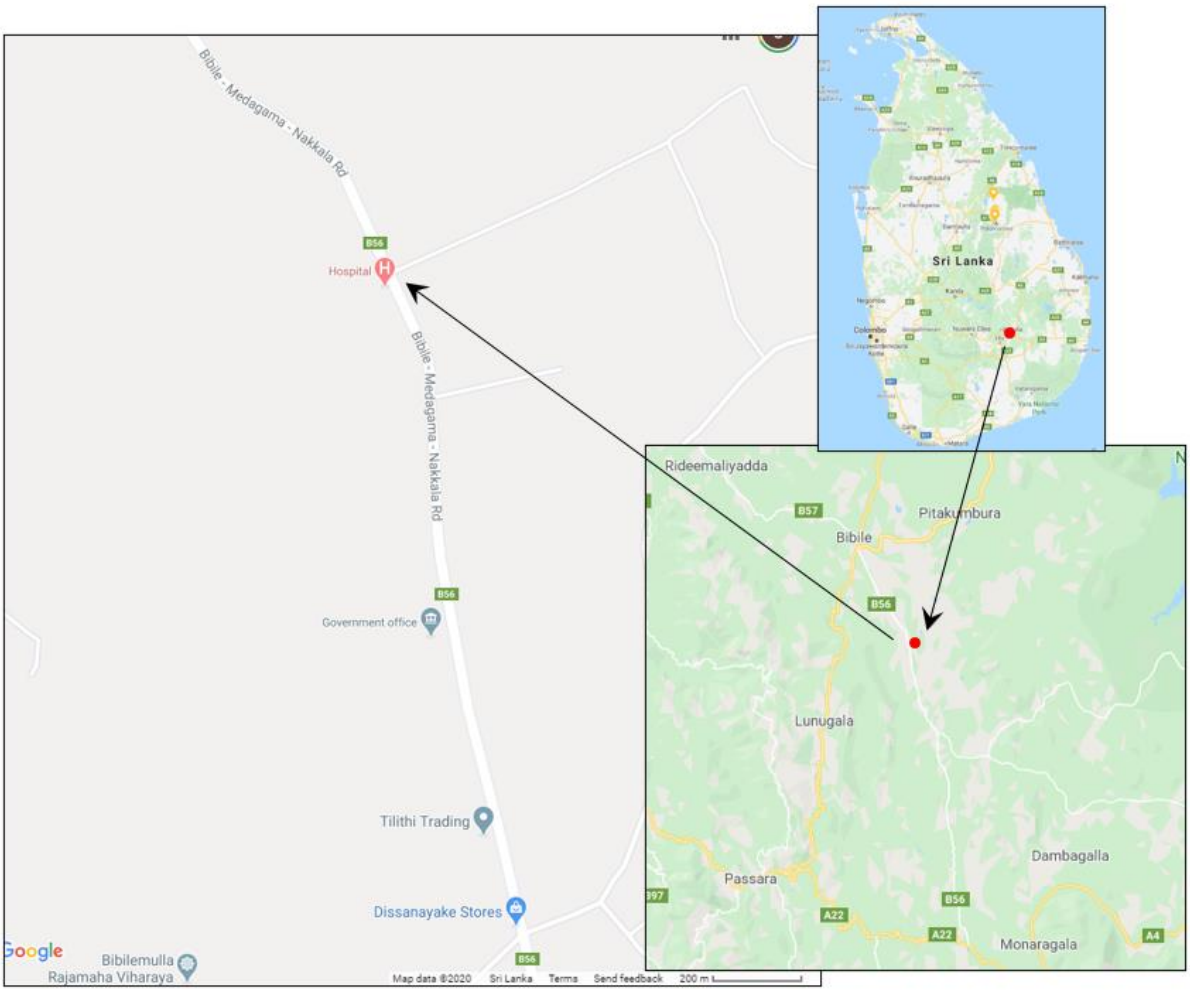


Figure 3.44: Location map of Nannapurawa PMCU (7° 5'54.88"N, 81°15'23.53"E)

131. Nannapurawa PMCU is located by the side of the B56 Bibile-Medagama-Nakkala Road, between Bibile Town (about 8 km towards Monaragala) and Medagama Junction (about 7.5 km towards Bibile). The PMCU is located about 0.85 km from Bibile Irrigation Engineer's office. The land belonging to the PMCU is about 00A 02R 26.96P and is flat terrain.

OPD Area

Clinic area

OPD Area

Only toilet available for patients

Figure 3.45: Existing condition of the facilities available at the Nannapurawa PMCU

132. The following are the facilities available at the hospital: OPD, staff quarters (for the MOIC), drug store, dressing room, consultation room, pantry, and other related facilities.

Table 3.28: Number of patients used the hospital facilities in 2018

No. of wards	-
No. of Beds	-
No. of outdoor patients	Annual: 9,061
No. of indoor patients	-
Clinics - Medical - NCD/Diabetes - Pre- and ani-natal	 Twice a week (No. of patients: 60–70 per week) Twice a week (No. of patients: 40–50 per week) Once a month (No. of patients: 20–30 per month)

Source: Department of Census and Statistics - Statistical Handbook, 2018 and Data provided by the PMCU

B.2.5.2 Need for sub-project

133. From the stakeholder consultations, it was found that the OPD and the Clinic sections are very crowded, during OPD hours and clinic days. The facilities available for the patients are not sufficient, especially waiting areas, disabled access, washroom facilities, etc. Space availability for general services such as the reception area, patients' registration area, record-keeping areas, drug store, etc. are also inadequate. There are no ETU and dental clinic. The facilities available for healthcare has to be further developed for a better and efficient service. There is no parking area for the PMCU.

Table 3.29: GN Divisions within the catchment and the population (2018)

GN Division	Female	Male	Total
Medagama DS Division			
106 Nannapurawa	700	691	1391
106C Dahamgama	632	632	1264
108 Kongolla	486	404	890
108B Diwiyapola	271	253	524
109B Nugamura	502	476	978
109 Kohukumbura	383	376	759
107B Bibilamulla	558	540	1098
106D Senpathigama	451	488	939
107 Senapathiya	480	525	1005
107A Aiwela	706	609	1315
106E Yakunnawa	604	566	1170
106B Bendiyawa	804	887	1691
106A Kotabowa	724	784	1508
Bibile DS Division			
99 Dodamgolla	735	730	1465

Source: Sampath Pethikada of the respective Divisional Secretariats (2018)

134. From Table 3.29, it is clear that the patient visits to the hospital in 2018 was nearly 9,000, and the catchment areas have a population of about 10,000. To reap the maximum benefits out of the health-sector reforms proposed under the HSEP, it is essential that facilities of the divisional hospital be developed, of which construction of the following buildings are needed, as detailed in B2.5.3.

B.2.5.3Proposed tasks/interventions at Nannapurawa PMCU

135. The following civil works are proposed for Nannapurawa PMCU.

- Construction of new building (See Figure 3.48)
- Demolition of part of an existing building (See Figure 3.46)
- Earth filling (as the area get soggy during and after rains)

- Altering drainage path and construction of new drains
- Construction of new soakage pit & septic tank (Existing septic tank is covered with thick shrubs)

The proposed land for the new building

The rear boundary of the existing building to be connected to the new extension. The rainwater drain will have to be altered

Frontal space for the new verandah/porch

Figure 3.46: Location-specific details at Nannapurawa PMCU site

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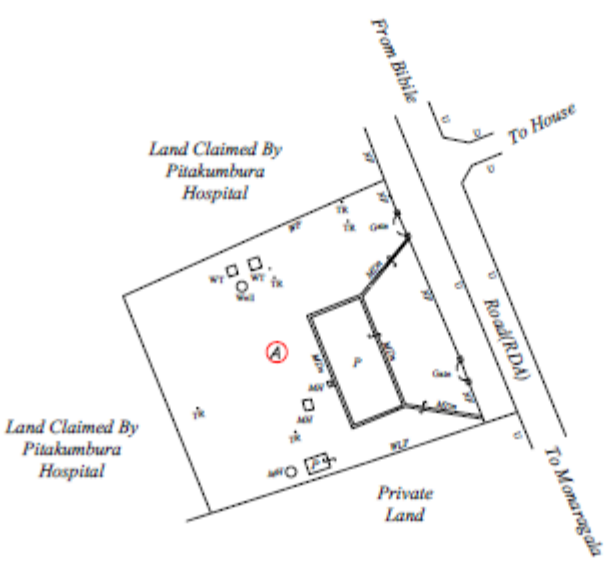
Dambagalla,
Monaragala.

Tracing no 2020/MO/03

PLAN OF PRIMARY MEDICAL CARE UNIT NANNAPURAWA



Scale 1:1000

Village :Nannapurawa
Minor Division :Medagampatthuwa Korale
D.S.Division :Medagama
District :Monaragala
Province :Uva

Reference

MDn : Masonry Drain
MH : Manhole
NF : Net Fence
WF : Wire Fence
WLF : Wire Live Fence
WT : Water Tank
TR : Tree
Road(RDA) : Road(Road Development Authority)
P : Permanent Building
◯ : Lot No

Lot No:	Schedule of Boundaries							
	Hectares	A	R	P	North	East	South	West
A	0.2705	0	2	26.96	Land Claimed By Pitakumbura Hospital	Road(RDA)	Private Land	Land Claimed By Pitakumbura Hospital
Total	0.2705	0	2	26.96				

Surveyed and Drawn by :
D.M.W.B.Dissanayake
Licd. Surveyor
12.03.2020

Surveyed on 10.03.2020

Figure 3.47: Contour Plan of the Nannapurawa PMCU Premises

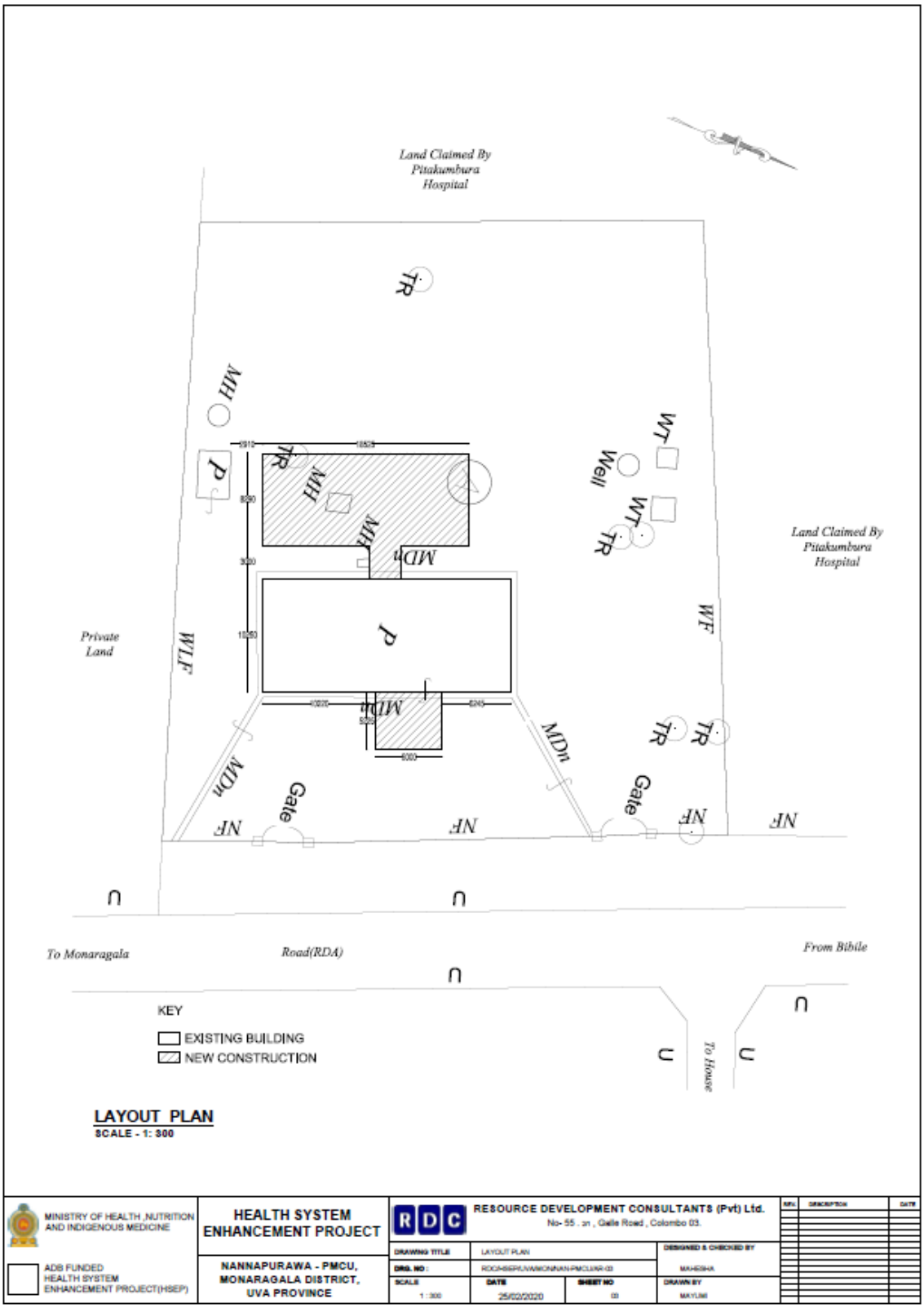


Figure 3.48: Locations and Layout of new construction works proposed for Nannapurawa PMCU

IV. DESCRIPTION OF THE ENVIRONMENT

A. Methodology Used for the Baseline Study

136. **Data collection.** The study was based partly on primary as well as secondary sources of information, reconnaissance and field surveys as the subprojects mainly involve laying of pipelines, the environmental impacts are expected to be local and short-term in nature considering the methodology of construction. However, baseline monitoring of water quality, noise, and dust levels will be conducted by the contractors before the commencement of civil works. Group and individual interviews were conducted to collect views of people in the area during the field visits.

137. A baseline survey was conducted to collect the data and information on physical condition, biodiversity status (habitat types, fauna, and flora species), land use pattern, and socio-economic structure of the project area. The flora and fauna species, which were recorded during the study, are included in this report.

138. The data collection was mainly through the following sources:

(i) Project details, reports, maps, and other documents obtained by the Consultant from various published sources and information available in the literature on land use, soil, geology, hydrology, climate, socio-economic profiles, demographic information, archaeological and religious places, etc.

(ii) Documents on Regulations, Legislation (especially Gazette notifications), Guidelines, and Standards

(iii) Secondary data from previous project reports and published articles

139. Visits to the sub-project areas were made several times since December 2019 and again in May and June 2020, to assess the existing environment and gather related information. Also, another desk study was conducted to record socio-economic data, archaeological, and places of religious importance, etc.

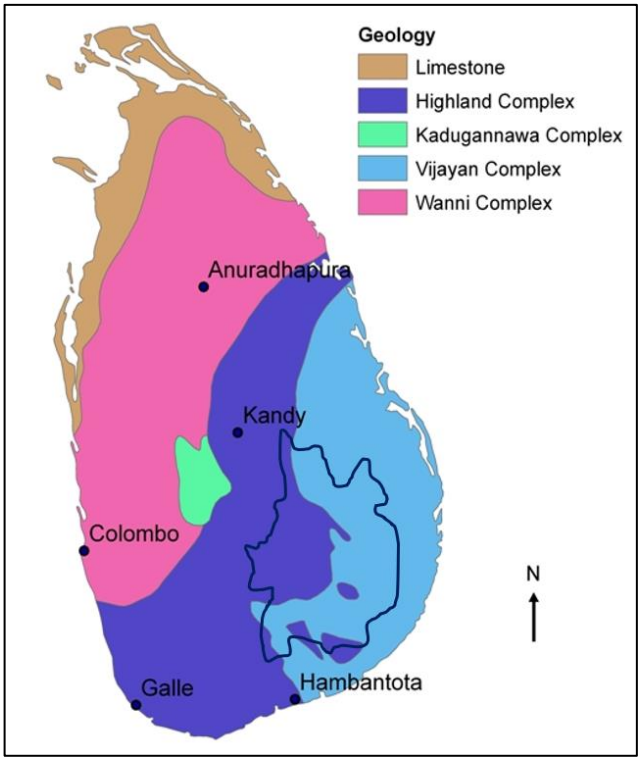
140. **Data analysis and interpretation.** The data and information collected, as outlined above, were analyzed to describe the physical, biological, and socio-economic features of the project area. The relevant information is presented in the following paragraphs.

B. Physical Characteristics

141. **Location.** The sub-projects involving civil works are located at ten different locations in Uva Province (Badulla and Monaragala Districts) – See Figure 3.2 and 3.3 for locations of the sub-project sites.

142. **Geology and geomorphology and soil.** More than 90 per cent of Sri Lankan rocks are metamorphic rocks that are metamorphic in high grades such as granulate and amphibolite facies. Most of the Sri Lankan crystalline rocks are belonging to Precambrian ages (older than 570 million years) while others are of more recent origin. This Precambrian age metamorphic rocks are subdivided into three major lithological groups as High land, Wanni complex and Vijayan complex. According to this categorization, a majority of the Monaragala district belongs to the Wanni complex where Precambrian metamorphic rocks are prominent. Meta sediments, Charnokitic Gneisses, underlying rocks, Migmatites and granitic gneisses, granites and pegmatite are mainly present in this region.

143. The Badulla and Monaragala districts are located within a transitional zone that goes from the central highlands to flat lowlands. In particular, the study areas are situated between the



mountains at the west and the flatter terrain that covers the broad eastern and southern plain. It combines different geographic and geological features and can be considered hilly, and steep but also as a rolling terrain in some areas within an elevation range of 160 to 450 meters. The information gathered from publicly available sources indicate that the underlying substrate is on Vijayan Complex, but within and near to the transition of the Highland complex.

144. Reddish-brown earth is the prominent soil type in the entire dry zone of the country. Sri Lanka has been subdivided into different agro-ecological zones considering soil type, rainfall, and land use etc. In the project area, Reddish Brown earth, Low Humic Gley soils and Grumusol soils are present

Figure 4.1: Uva Province is located within Highland Complex (mostly Badulla District) and Vijayan Complex (mostly Monaragala District)

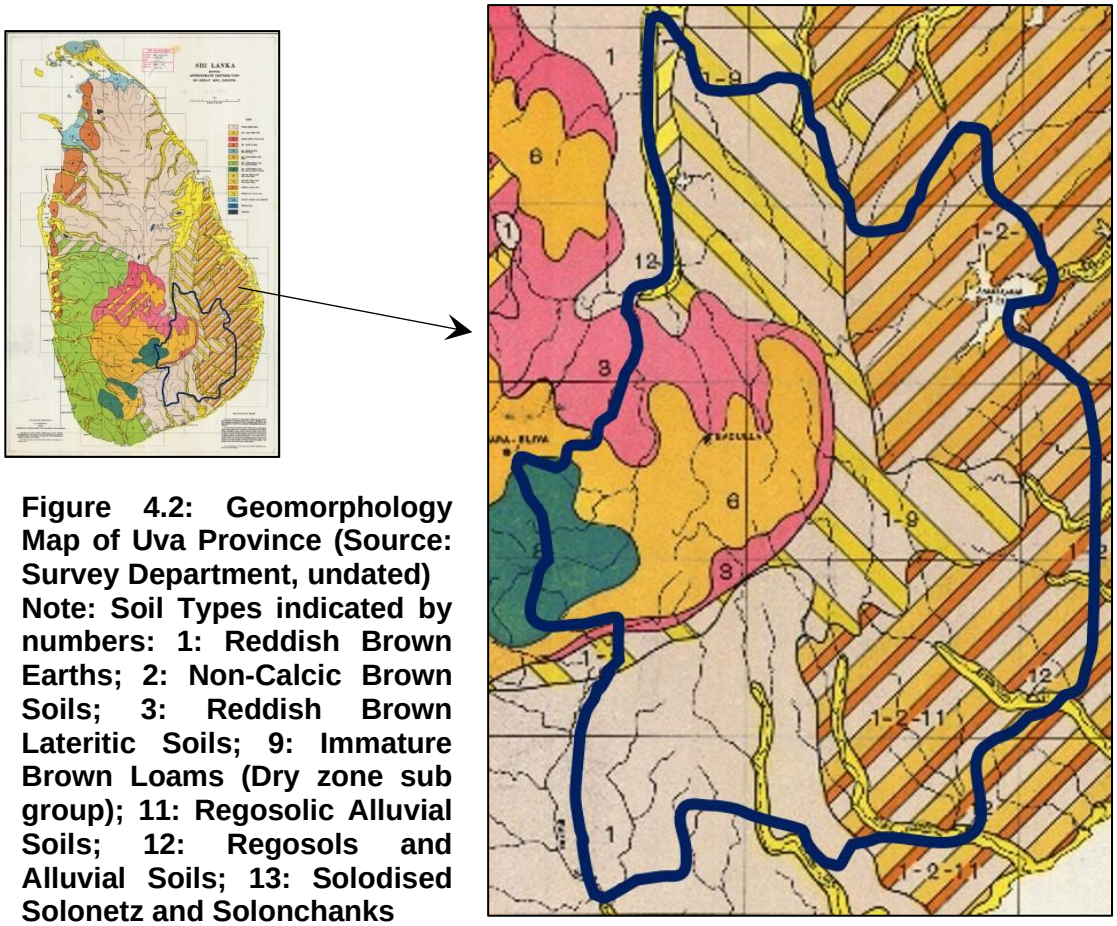


Figure 4.2: Geomorphology Map of Uva Province (Source: Survey Department, undated)
Note: Soil Types indicated by numbers: 1: Reddish Brown Earths; 2: Non-Calcic Brown Soils; 3: Reddish Brown Lateritic Soils; 9: Immature Brown Loams (Dry zone sub group); 11: Regosolic Alluvial Soils; 12: Regosols and Alluvial Soils; 13: Solodised Solonetz and Solonchanks

145. **Topography.** The landscape of Uva Province consists of: (i) Uva basin, (ii) Southern mountains, (iii) High plans, (iv) Eastern plateau, (v) Lunugala ridge, (vi) Mahaweli River valet, and (vii) Lowland plains. However, Uva Basin contains three sub-basins: (i) Welimada sub-basin, (ii) Badulla sub-basin, and (iii) Uva highlands. Monaragala District generally has the flat and undulating terrain whereas the Badulla District has a more diverse landscape with high mountainous areas. In terms of altitude, the Upper Uva represents highlands reaching above 300 m. There is a general altitudinal descend from the SW side to NE side, while the average altitude of Upper Uva regions is about 1000 m. The western flank of the Uva Basin rises to over 2000 m up to Horton Plains Highlands, peaks up to 2,376 m at Hakgala and extends across Uda Pussellawa ridges. The Lower Uva consisting of southern and eastern peripheries represents lowland plains below 300 m. Many sporadic isolated hills are ranging from 300–650 m are noted in Monaragala and Kataragama areas. The mountains extending across the Haputale gap on the eastern side abruptly rises from the lowland of the dry zone up to an altitude of 1,000–1,500 m. High instability of the escarpment terrain is evidenced by the frequent landslides on southern aspects towards Beragala and Koslanda. The landscape form the walls of southern mountains towards Uva Basin descends gradually with gentle slopes, rounded hills, and open valleys.

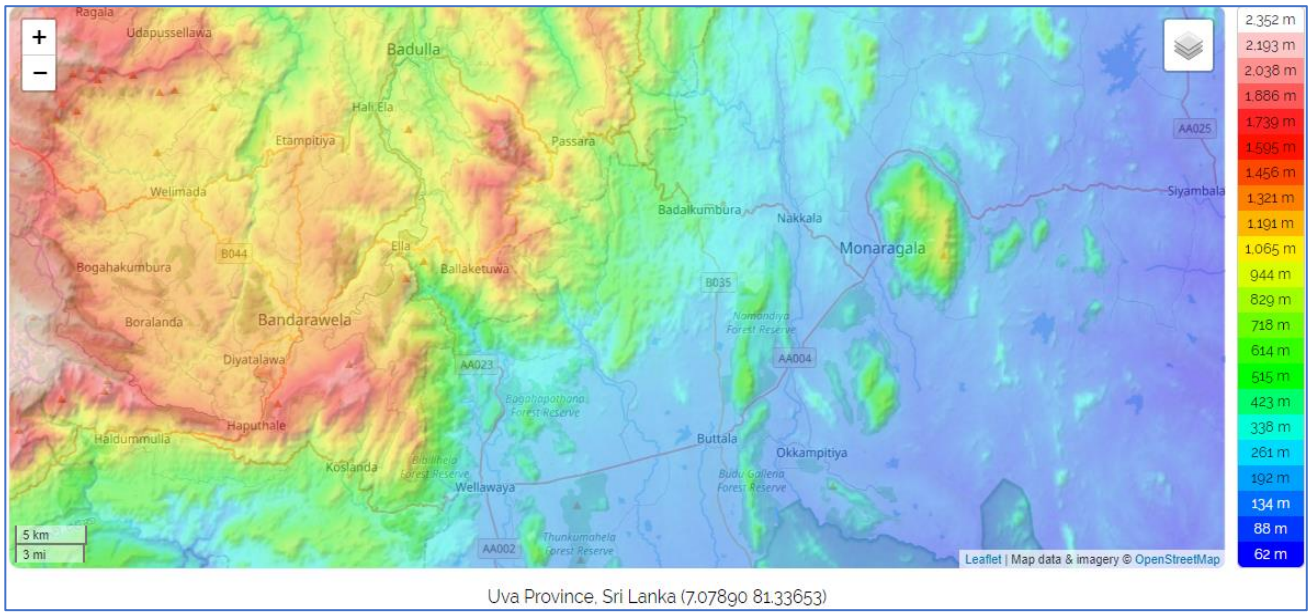


Figure 4.3: Elevation profile of Uva Province

146. The lowlands, especially the areas belonging to Monaragala district, are subjected to an intermediate zone climate and supports extensive areas of grasslands. The landscape is undulating or gentle to moderate sloped low hills with some isolated hills (Wadinahela, Govindahela, Monaragala, Inginiyagala and Nilgala).

Climate: Uva Province has many different climates but is dominated by Aw (See Table 4.1).

Table 4.1: Climate regions found in the Uva Province

Classification	Köppen-Geiger	Examples
Tropical savanna climate	Aw	Katharagama, Wellawaya, Mahiyanganaya, Sella Katharagama, Mapakada CP
Tropical monsoon climate	Am	Koslanda, Badulla, Galwatta, Bandarawela, Ella
Tropical rainforest climate	Af	Welimada, Kalupahana, Beragala, Walhaputhenna, Haldummulla
Oceanic climate	Cfb	Idalgashinna, Haputhale, Ohiya

147. Badulla District belongs to the Intermediate zone and small part in the wet zone and an annual rainfall of the district range from 1,500 mm to 2,400 mm with the highest rainfall recorded during the North-East monsoon period from October to January. Places such as Welimada receives a rainfall of about 1,500 mm whereas places such as Uda Pussellwa receives an annual rainfall exceeding 2,400 mm. A significant part of the Monaragala district belongs to the dry zone of Sri Lanka, and an annual rainfall of the entire District is in the range of 1,100 mm to 2,000 mm with the highest rainfall recorded during the North-East monsoon period from October to January. Lower Uva generally exhibits a transition between dry and intermediate climatic conditions, as evident from the climates prevailing in places like Monaragala, Buttala, Wellawaya and Bibile.

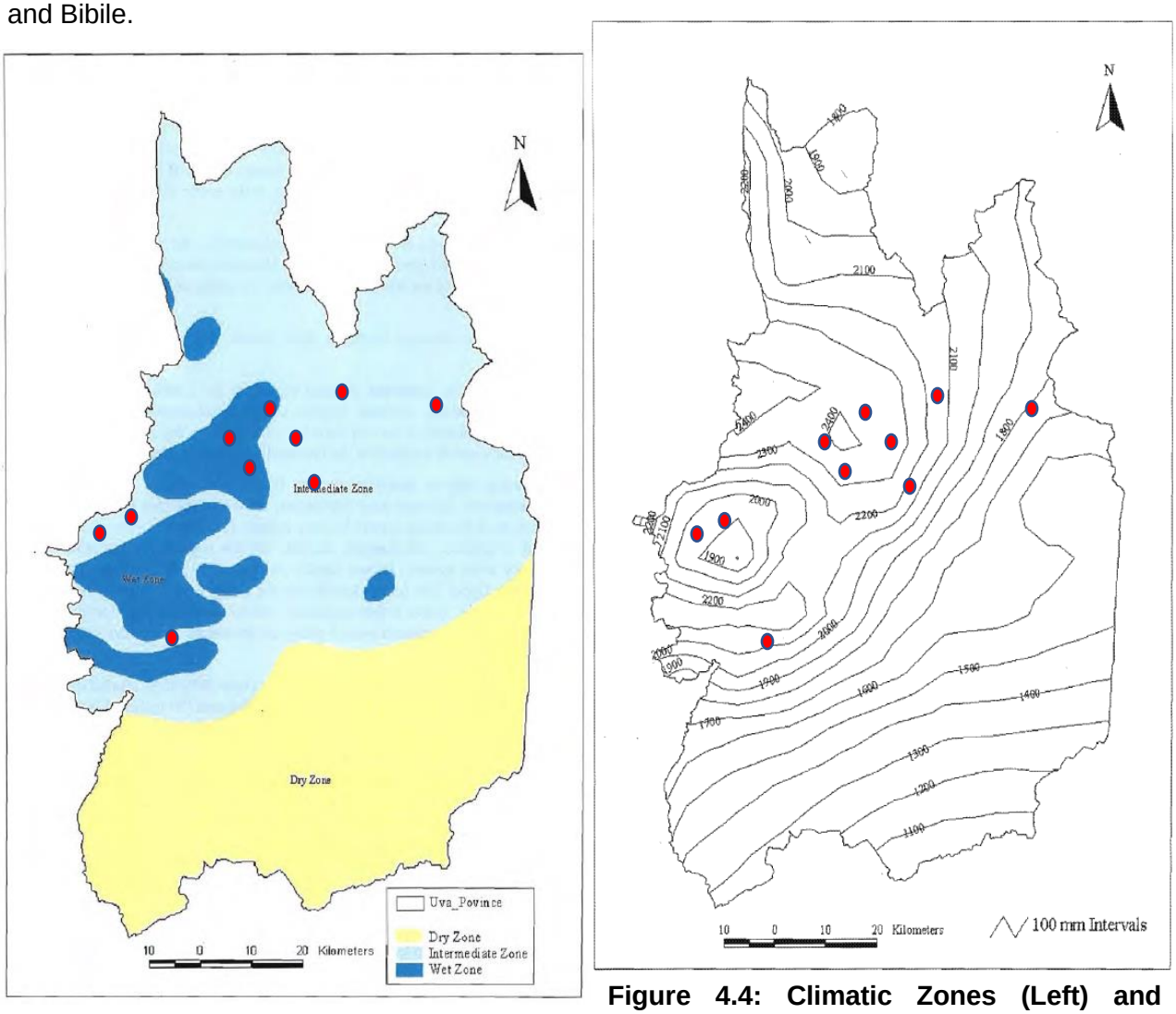


Figure 4.4: Climatic Zones (Left) and Rainfall isohyets (Right) in Uva Province

Source: Jayasuriya et al. (2006) and Jayasuriya (2008)

148. The average temperature in the Badulla district varies depending on the location. Locations in Upper Uva such as Haputale, the average temperature ranges from 15–23 °C, in locations of intermediate altitude such as Badulla, the temperature ranges from 21–25 °C, while in the dry lowlands it is about 26–29 °C. The average temperature in the Monaragala district varies from 26 °C to 29 °C, while the average annual temperature of the project area is between 29- 30 °C. The highest temperature of 30 °C is recorded from June to August of the year.

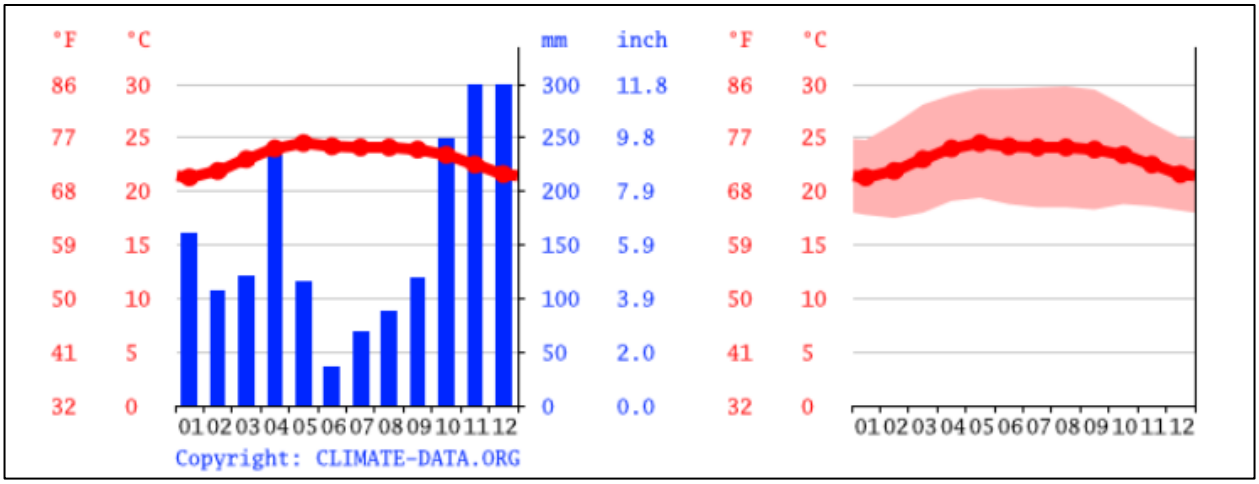


Figure 4.5: Monthly average rainfall pattern and the monthly average temperature in Badulla (Source: https://en.climate-data.org/asia/sri-lanka/Uva-province/ badulla-764256/ #climate-graph)

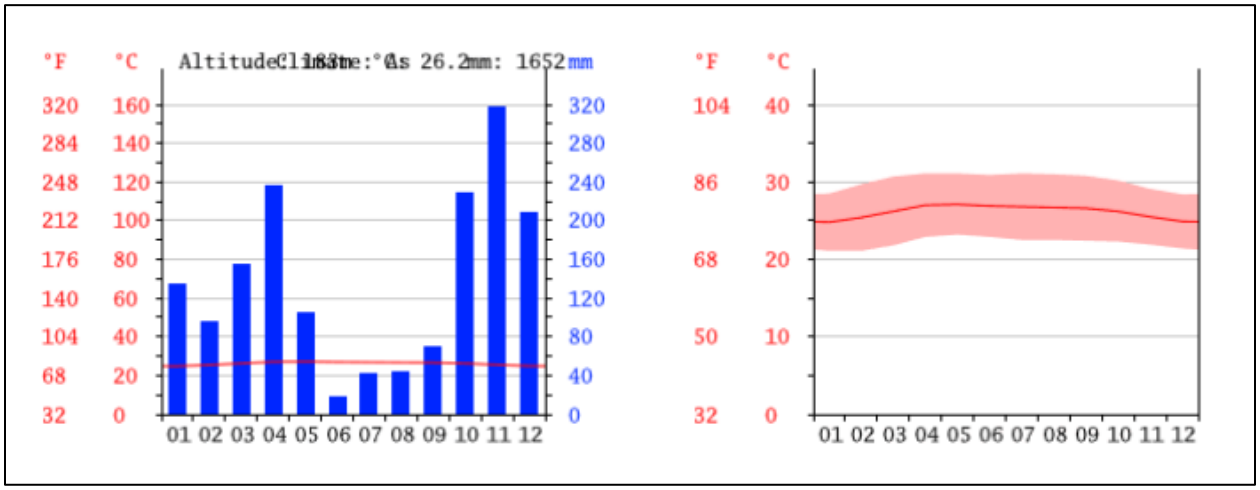


Figure 4.6: Monthly average rainfall pattern and the monthly average temperature in Monaragala (Source: https://en.climate-data.org/asia/sri-lanka/Uva-province/Monaragala-56122/# climate-graph)

149. **Hydrology, Drainage and River Basins.** The river basin system that originates from the stream network represented in the Uva Province is shown in Table 4.2. The river systems located within the Uva Province mostly originate in the west highlands and traverse the dry lowlands zone. However, a majority of the stream network undergoes seasonal drying up during water-deficit periods as a significant portion of the Uva is subjected to a drier climate. The dominant water-surplus period is November - December, while the minor water-surplus period is March - April. Mahaweli Ganga is the main river that is nourished by some of its main branches such as Uma Oya, Badulu Oya, Meda Oya and Loggal Oya located in the Province. Menik Ganga, Kirindi Oya and Kumbukkan Oya originate from the central hills within the UP. At the same time, Heda Oya, Vila Oya and Karanda Oya are small rivers that originate from the lowlands in this Province and directly meet the sea.

Table 4.2: River basins that are represented in the UP

River Basin	Extent (hectares)	Proportion (%)
Mahaweli Ganga	184,234	21.36
Menik Ganga	121,939	14.13
kumbukkan Oya	110,817	12.84
Gal Oya	106,848	12.38
Kirindi Oya	88,408	10.21
Walawe Ganga	80,213	9.30
Heda Oya	41,870	4.85
Maduru Oya	32,305	3.74
Wila Oya	27,429	3.18
Karanda Oya	14,400	1.66
Mundeni Aru	14,303	1.65
Malala Oya	13,930	1.61
Unnichchnai	7,938	0.92
Kurundu Ara	6,729	0.78
Nabadagas Ara	3,803	0.56
Katupila Ara	3,289	0.44
Bagura Oya	1,626	0.18
Pannel Oya	1,359	0.15
Bambawe Ara	797	0.09
Butawa Oya	235	0.02
Karambe Ara	8	0.00

Source: Jayasuriya (2008)

150. There are many tanks found in the Uva Province, mostly located in the dry parts, in the Monaragala District. The perennial and seasonal tanks in the Uva Province constitute 18,011 and 385 hectares, respectively. There are eight tanks (and associated irrigation systems) in Badulla District (largest: Nagadeepa Scheme) and 17 in the Monaragala District (largest: Uda Walawe). The project areas fall within several river basins, as shown in Figure 4.7 and Table 4.3. No major rivers or streams are flowing in the vicinity of any of the sites (at least for 500 m).

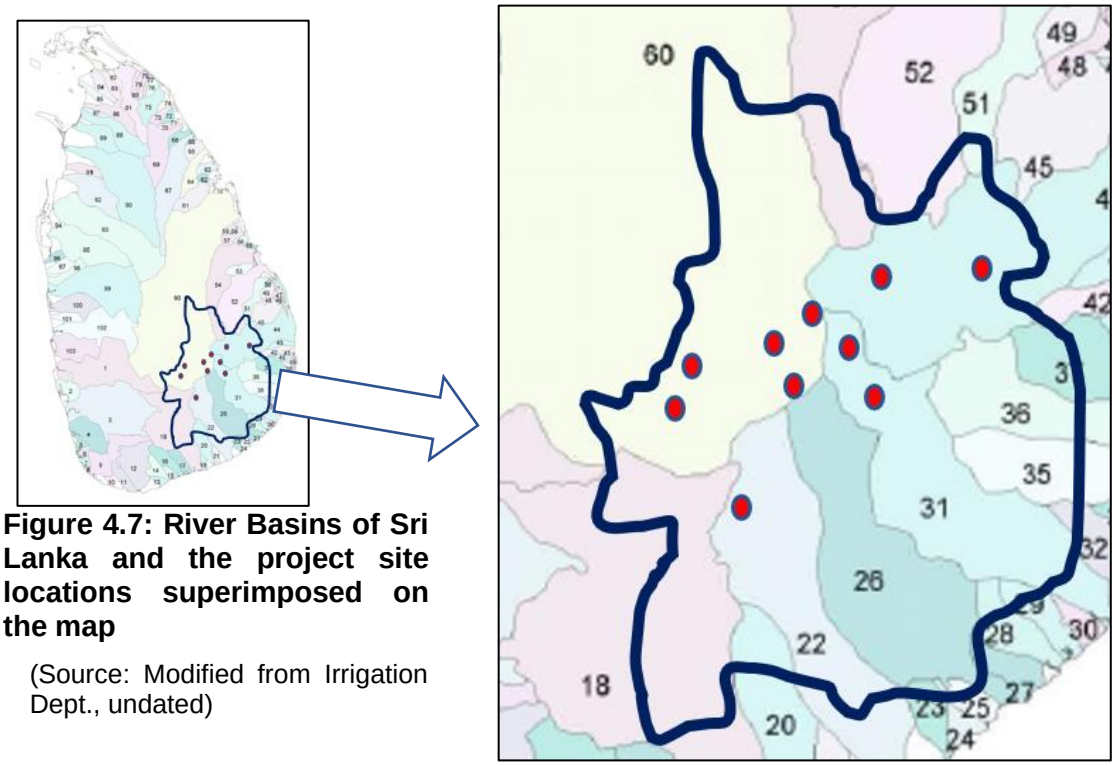


Figure 4.7: River Basins of Sri Lanka and the project site locations superimposed on the map

(Source: Modified from Irrigation Dept., undated)

Table 4.3: River basin where sub-project areas are located within upper catchments

Sub-project Location	River Basin	Sub-project Location	River Basin
Badulla District		**Monaragala District**	
Haputale DHB	22: Kirindi Oya	Medagama DHB	31: Kumbukkan Oya
Metigahatenna DHB	60: Mahaweli Ganga	Nannapurawa PMCU	31-44: on the border of Kumbukkan Oya and Gal Oya
Carklees DHC	60: Mahaweli Ganga	Kotagama PMCU	60-31-44: Border of Menik, Kumbukkan and Gal Oya
Uva Paranagama DHB	60: Mahaweli Ganga	Pitakumbura DHB	44: Gal Oya
Lunugala DHB	60-26: Border of Menik & Mahaweli Ganga	Rathmalgaha Ella PMCU	44: Gal Oya

151. **Ground Water.** Groundwater in dug wells has high fluoride and chloride concentrations as well as increased total solids and high electrical conductivity as per the water quality analysis carried out by WHO and NWS&DB for last 20 years. In general, geochemically, Na/K with Cl^- is high in the groundwater in the Monaragala district, especially during the dry period. It is also believed that high fluoride content in groundwater has affected to cause dental fluorosis and Chronic Kidney Disease (CKD).

152. People suffering from CKD is on the increase despite medical treatments. Heavy elements like Cr, Mn and Cu are high in groundwater too. Although the actual cause of CKD is not known, high fluoride content and total solids have affected severely on the people of Lower Uva.

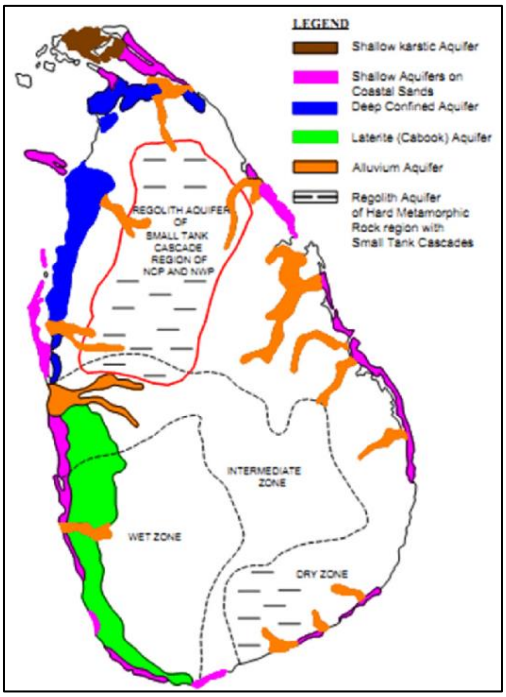


Figure 4.8: Groundwater Aquifers in Sri Lanka. It is prominent that the project areas in Monaragala District consists of Regolith Aquifer of Hard Metamorphic Rock, where there are many small tank cascades are prominent.

153. **Air Quality.** Since the selected sub-project locations are mostly located within rural areas (other than Lunugala DHB and Haputale DHB), sources of air pollutants are hardly found. Therefore, air quality in such sub-project areas appears to be good. However, there is a chance of deteriorating the air quality temporarily due to vehicular emissions and drifting of dust from gravel roads and other deteriorated roads.

154. Domestic sources of air pollution will include emissions from burning of forest patches for chena cultivation (slash and burn), wood and kerosene burning stoves in settlements and villages. As the sub-project areas are rich in vegetation, all such emissions will be very well dissipated.

155. Vehicle Emission Test (VET) became mandatory with effect from 15th July 2008 to enforce environmental regulations and conform to the environmental standards on vehicle emission as per the Motor Traffic Act (Emission Control) Regulation of 1994, 817/6, Part I, Section I. This move is a part of the efforts to improve the air quality in the island. This regulation applies to all construction sites if air quality is going to be deteriorated.

156. **Existing Noise levels.** The subproject sites are mostly located in rural settings (other than Lunugala DHB; Haputale DHB is located about 1.5 km from the town) with a good vegetation cover. Therefore, the noise levels are relatively low. According to Schedules I and II of National environmental (Noise Control) regulations No.1 1996 (924/12), the study areas belong to Low noise area[19]. Therefore, the ambient noise level of the areas can be considered as <55 dB (A) during daytime (06.00 hrs-18.00 hrs) and <45 dB (A) nighttime (18.00 hrs - 06.00 hrs). Rich vegetation in the subproject sites acts as an efficient noise absorbent.

157. Existing ambient noise and vibration levels in the areas are consistent with rural and suburban and light industrial areas. There is also moderate levels of traffic noise from adjoining roads in locations such as Nannapurawa PMCU, Pitakumbura DHC, Lunugala DBH, and Haputale DHB. Industrial activities and commercial activities of much of the project area are not very significant to have high levels of noise. However, Lunugala DHB, Nannapurawa PMCU and Pitakumbura DHC are located close to busy roads where commercial activities are moderately high (e.g., B527 Bibile-Pita Kumbura-Namal Oya-Inginiyagala Road. And B56 Bibile-Medagama-Nakkala Road), where significant volumes of traffic pass through these sections, causing frequent moderate levels of noise pollution.

C. Biological environment

158. **Bio-regions:** In the Uva Province, there are five bioregions:

- Bio-region 2: Dry zone. Dry mixed evergreen forest; altitude 0–500 m; rainfall 1,250–1,900 mm (mainly from Oct. to Jan.): 4 -5 dry months
- Bio-region 3: Intermediate zone. Moist evergreen forest; altitude 0–1,000 m; annual rainfall 1,900–2,500 mm; less than three dry months.
- Bio-region 4: Lowland Wet Zone. Tropical (lowland) wet evergreen forest; altitude up to 1,000 m; annual rainfall 2,500–5,000 mm; no dry months
- Bio-region 6: Highlands. Montane evergreen forests; altitude 1,500–2,500 m; annual rainfall 2,500–5,000 mm; no dry months.
- Bio-region 7: Intermediate highlands. Dry patanas; altitude 1,000–1,500 m; annual rainfall 1,900–2,500 mm; less than 3 dry months.

[19] "Low noise area" means an area located within any Pradeshiya Sabha area. All the 10 sub-project sites are located within Pradeshiya Sabha areas.

159. **Agro-ecological zones.** Table 4.4 shows that 14 agro-ecological zones are represented in the Uva Province.

Table 4.4 Agro-ecological zones represented in the Uva Province

Agro-ecological region		Extent (hectares)	Proportion of the total area (%)
DL 1	[Dry Low-country 1]	325,958	37.8
IL 2	[Intermediate Low-country 2]	193,847	22.5
IL 1 & IL 2	[Intermediate Low-country 1 & Intermediate Low-country 2]	64,695	7.5
IM 2	[Intermediate Mid-country 2]	61,928	7.2
IU 3	[Intermediate Up-country 3]	58,236	6.7
DL 2	[Dry Low-country 2]	44,190	5.1
IM 1	[Intermediate Mid-country 1]	41,907	4.8
IU 2	[Intermediate Up-country 2]	29,466	3.4
IU 2 & IU 3	[Intermediate Up-country 2 & Intermediate Up-country 3]	18.250	2.1
WU 3	[Wet Up-country 3]	12,590	1.5
DL 5	[Dry Low-country 5]	5,691	0.7
WM 3 & IM 2	[Wet Mid-country 3 & Intermediate Mid-country 2]	5,490	0.6
WM 3	[Wet Mid-country 3]	202	0.0
WU 2	[Wet Up-country 2]	40	0.0

Source: Source: Jayasuriya (2008)

160. It is evident that a significant portion of the Uva Province lies in the dry lowlands and intermediate lowlands and intermediate midlands, only a relatively small land area belongs to the wet highlands. As the Province accommodates a broad intermediate agro-ecological region, the cultivation appropriate crops, such as sugar cane, a variety of vegetable, papaya, banana, etc. has been thriving.

161. The agro-ecological regions of the sub-project locations are given in Table 4.5 and Figure 4.9. All the five sub-project locations in Badulla District are located in the intermediate zone (IU2 and IU3), while the sub-projects in Monaragala are located within intermediate lowlands (IL1 and IL2), intermediate midland (IM2b) and one project in the dry lowland (DL2a).

Table 4.5: Sub-project locations and agro-ecological regions where they are located.

Sub-project Location	**Agro-Ecological Region**	**Sub-project Location**	**Agro-Ecological Region**
Badulla District		**Monaragala District**	
Carkeels DHC	IU3e	Medagama DHB	IL1c
Uva Paranagama DHB	IU3e	Nannapurawa PMCU	IM2b
Haputale DHB	IU3a	Kotagama PMCU	IL2
Metigahatenna DHB	IU2	Pitakumbura DHC	IL2
Lunugala DHB	Border of IU2 and IM2b	Rathmalgaha Ella PMCU	DL2a

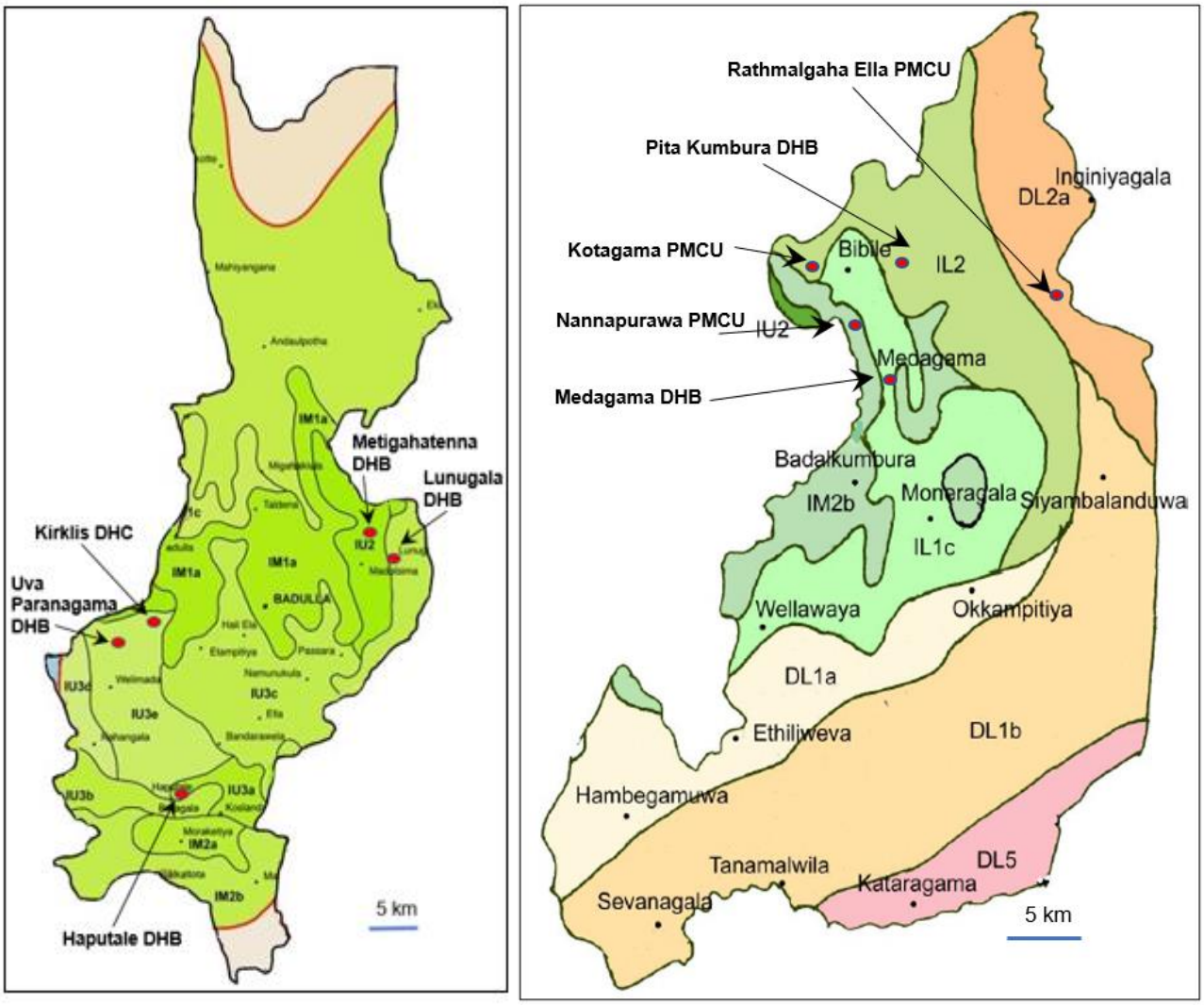


Figure 4.9: Sub-project locations and agro-ecological regions where they are located.

162. **Floristic Regions.** Out of the 15 floristic regions proposed by Ashton & Gunatilleke (1987), there are four floristic regions represented in the Uva Province

- **Floristic region A:** Dry and arid lowlands: (i) Tropical dry mixed evergreen forests (*Manilkara* Community); (ii) Mixed community (*Chloroxylon- Vitex-Berrya-Schleichera* series); (iii) Tropical thorn forests (*Manilkara-Chloroxylon-Salvadora-Randia* series); (iv) Damana and Villu series; (v) Flood plain wetlands, Riverine and gallery forests
- **Floristic region B2:** Eastern intermediate lowlands: Tropical mist semi-evergreen forests and Savanna forest
- **Floristic region G:** Central mountains, Ramboda-Nuwara Eliya: Tropical montane forests and Upper wet patina grasslands
- **Floristic Region I:** Horton Plains: Tropical montane forests and Upper wet patana grasslands.

163. The sub-project locations and the floristic regions are shown in Figure 4.10.

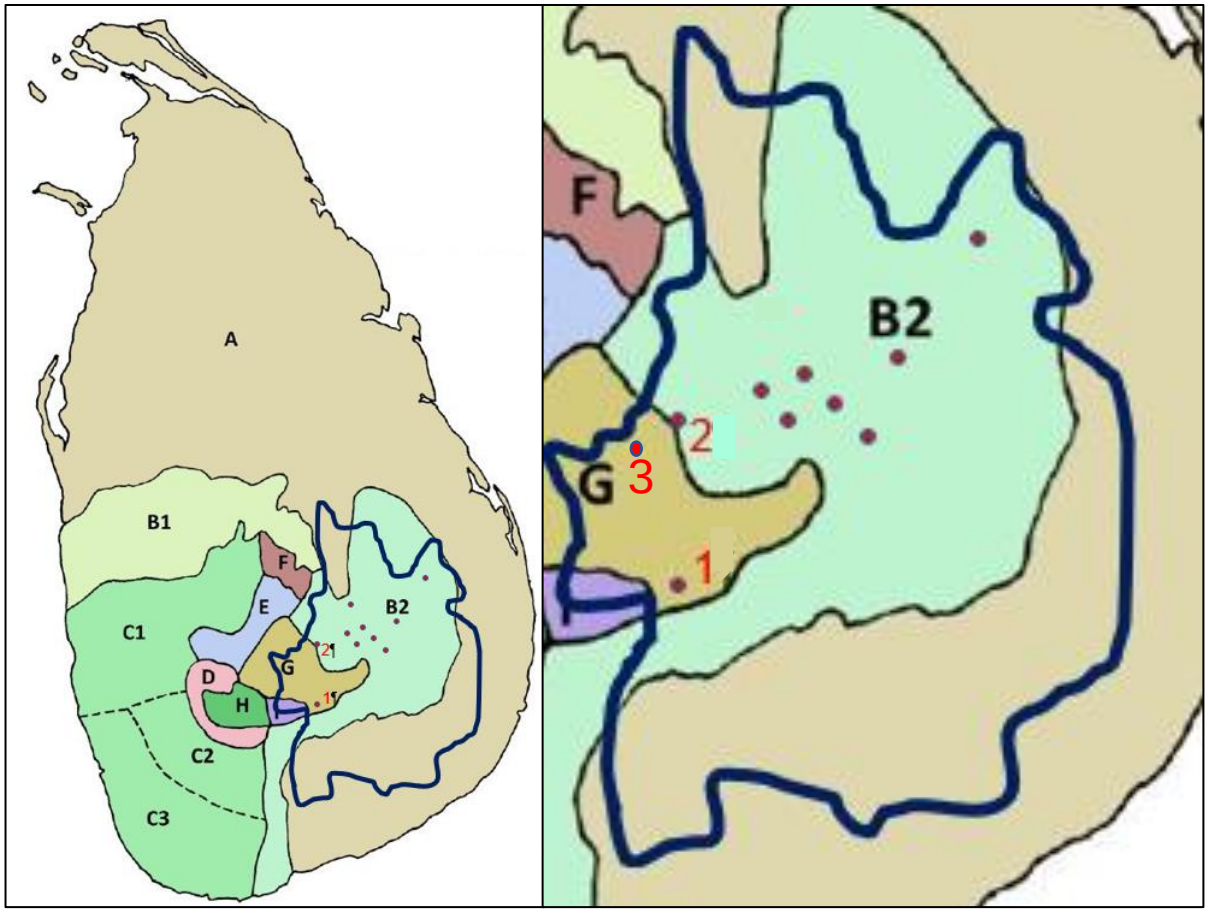


Figure 4.10: Uva Province falls within four floristic regions.

A: Dry Zone and arid lowlands; B2: Eastern Intermediate Lowlands; G: Central Mountains Ramboda – Nuwara Eliya & I: Horton Plains

164. Haputale DHB and Uva Paranagama DHB falls within the floristic region of G (marked as 1 and 3), Carkeels fall on the boundary of floristic regions G & B2 (marked as 2), and all the other sites are located in the floristic region of B2.

Vegetation within the proposed sites

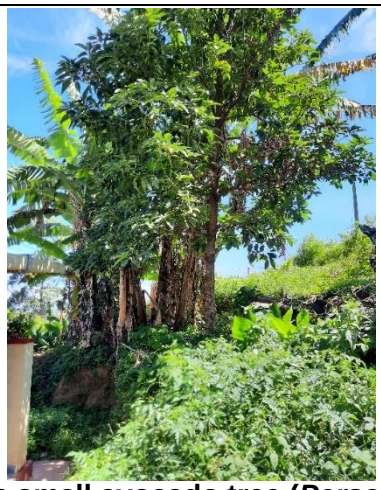
165. Field visits were conducted to each of the ten sites in the Uva Province. None of the sites had flora species that can be categorized as Threatened, Vulnerable or endangered. All the tree species are commonly found throughout the country.

(a) BADULLA DISTRICT

(i) Haputale DHB

166. There are some banana trees (about 10–20), and other commonly found shrubs within site. There is a small sapu tree trees (*Magnolia champaca*) and an avocado tree (*Magnolia champaca*) that will have to be cut. Both these trees are small (DBH < 100 mm) and are commonly found in the vicinity.

Banana bushes and small sapu tree (*Magnolia champaca*) in the site boundary



The small avocado tree (*Persea americana*) that needs the removal

Shrubs in the land for the proposed building

Figure 4.11: Vegetation at the proposed site for civil works at Haputale DHB

(ii) Metigahatenna DHB

167. Two trees need to be removed before the construction of the new building: a mango tree (*Mangifera* species – DBH 400 mm) and a Toona tree (*Toona ciliate* – DBH 450 mm).

Mango tree (*Mangifera* species) that needs to be removed

Toona tree (*Toona ciliate*) that needs to be removed

Figure 4.12: Tree that needs removal at the site proposed for at Metigahatenna DHB

(iii) Lunugala DHB

Mango tree (*Mangifera* species) that needs to be removed

The small avocado tree (*Persea americana*) that needs removal

Shrubs found within the land

Shrubs found within the land

Figure 4.13: Tree that needs to be cut at the proposed site for civil works at Lunugala DHB

168. Two trees need to be removed before the construction of the new building: a mango tree (*Mangifera* species – DBH 600 mm) and a Small avocado tree (*Persea americana* – DBH 150 mm). Part of the site is covered with shrubs and some gliricidia plants and exotic plants that form a fence.

(iv) Uva Paranagama DHB

169. There is a Kitul palm tree (*Caryota urens*) which needs removal. This Kitul tree is very old and would fall at any time. There are two avocado trees (*Persea americana***)**, which have been heavily pruned recently, and needs removal (DBH ~250 mm). They are located very close to the embankment. The banana bushes and the bamboo bush next to the access road needs removal. The backyard of the building and the embankment is covered with weeds, creepers and bushes commonly found in the area.



Two avocado trees (*Persea americana*) and the banana bushes that need removal



Kitul tree **Vegetation on the embankment** **Bamboo on access road**

Figure 4.14: Tree that needs to be cut at the proposed site at Uva Paranagama DHB

(v) Carkeels DHC


The Erabadu tree (*Erythrina variegata*) and the two small guava plants (*Psidium guajava*) that need removal

The proposed location is part of the tea estate, where there are about 50 tree bushes. There is a hedge of andara plants (*Duranta repens*). Common weeds are also found.

Figure 4.15: Tree that needs to be cut at the proposed site for civil works at Carklees DHC

170. The proposed land is part of the tea estate has about 50 tea bushes. An Erabadu tree Erythrina *variegata* - DBH: 200 mm) and the two small guava plants (*Psidium guajava*) need removal. Erabadu is commonly found in the areas, especially in tea estates which are grown for shade. The andara (*Duranta repens*) hedges are commonly found everywhere in the country. There are rock outcrops scattered in the area, including the proposed land plot, some of which may need to be removed.

(b) MONARAGALA DISTRICT

(i) Kotagama PMCU

Banana and cassava in the site area

Gliricidia trees and the jack tree plant that needs the removal

Banana and papaya trees in the site area

The cycas (madu) palm tree (*Cycas nathorstii*) that needs removal

Figure 4.16: Vegetation at the proposed site for civil works at Kotagama PMCU

171. There are some banana trees (about 20–30), cassava and other commonly found shrubs within site. There are two cycas (madu) palm trees (*Cycas nathorstii*) and a jack tree plant (*Cocos nucifera*), out of which one madu palm tree will have to be cut. The jack tree is a plant and can be removed.

(ii) Nannapurawa PMCU

Domba tree (*Calophyllum inophyllum*) that needs removal (DBH: 600 mm)

Two hik trees (*Lannea coromandelica*) and kenda tree (*Macaranga peltate*) needs removal (DBH < 100 mm)

Cassava bushes in the boundary of the land

Shrubs found within the land

Figure 4.17: Vegetation at the proposed site for civil works at Nannapurawa PMCU

172. The land proposed for the new extension building is covered with shrubs. There are some cassava bushes cultivated in the border of the land. There is a large Domba tree (BBH: 600 mm), two small hik trees (*Lannea coromandelica*) (DBH: 100 mm) and one kenda tree (*Macaranga peltate*) (DBH < 100 mm) that needs removal.

(iii) Rathmalgaha Ella PMCU

Gliricidia tree (*Gliricidia sepium*) that needs to be removed (DBH: 300 mm)

The mango tree (*Mangifera indica*) that needs to be removed (DBH: 600 mm)

Vegetation along with the Ela (canal) located between the Inginiyagala Road and the PMCU premises. The banks are covered with Rata Thana (*Panicum maximum*)

Vegetation towards the eastern side from the proposed site. There are 10–12 small Gliricidia trees (*Gliricidia sepium*), which may need removal during site clearing

Figure 4.18: Vegetation at the proposed site for civil works at Rathmalgaha Ella PMCU

173. The site proposed for the new building has a large mango tree (*Mangifera indica*) that needs removal (DBH: 600 mm). There is another gliricidia tree (DBH: 300 mm) (*Gliricidia sepium*) that needs removal for the access road to the site. The site proposed for the new building is covered with weeds and shrubs, and some vegetable plots.

174. There is a Burutha tree (Satinwood - *Chloroxylon swietenia*) near the site, and this tree should not be removed.

(iv) Pitakumbura DHB

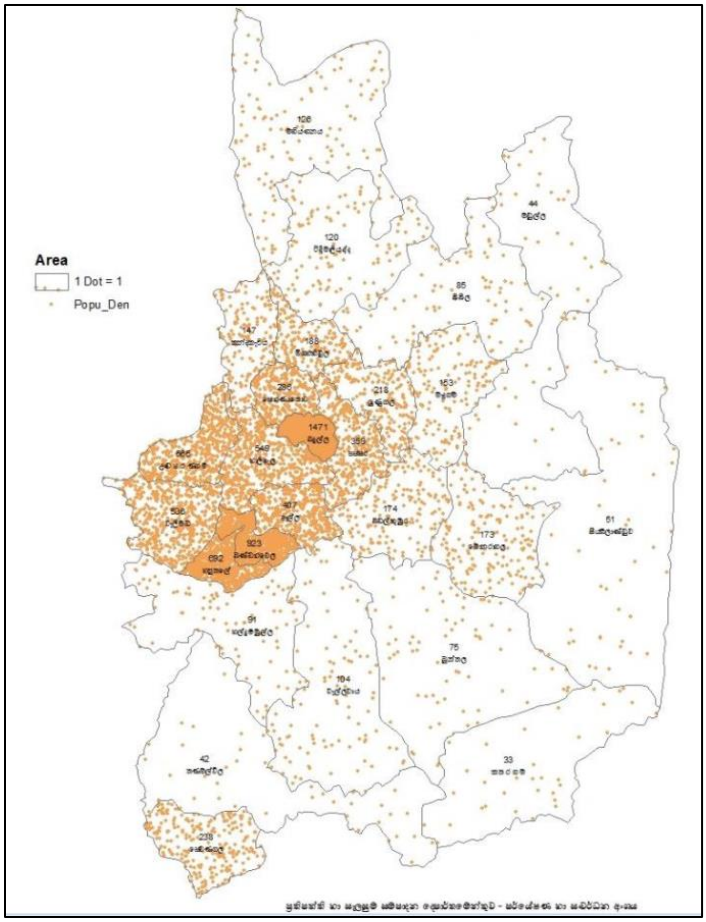
175. No trees will be cut, except for a banana tree and a coconut plant for building the access road, and some cassava bushes and exotic flowering plants within the site premises proposed for the extension building.

Banana and a coconut plant in the proposed access road for the ambulance

The proposed site for the extension building

Figure 4.19: Vegetation at proposed site for civil works at Pitakumbura DHC

D. Socio-economic Characteristics

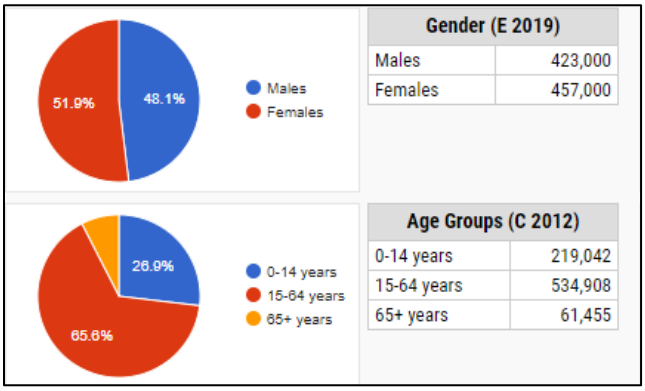


176. **Demography.** There are two provinces located within Uva Province: Badulla and Monaragala. The total population in Badulla and Monaragala District was 815,405 and 415,058 persons as per the 2012 census. The estimated populations of the two districts as of 2019 July are 880,000 and 496,000 for Badulla and Monaragala, respectively.

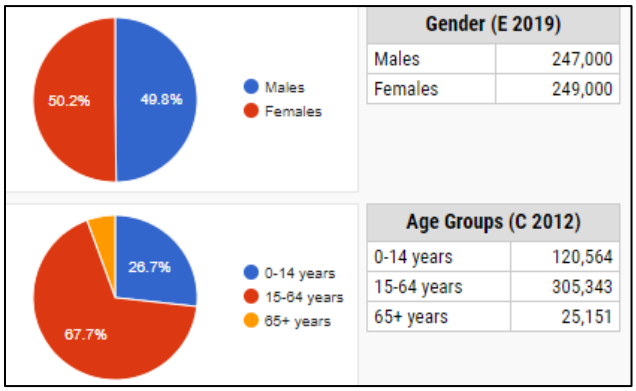
177. The population density shows a marked variation between the two districts (see Figure 4.20). Badulla District has a higher density, and there are dense population centres at Badulla (1,471/km^2), Bandarawela (923/km^2) and Haputale (692/km^2). However, Monaragala is sparsely populated, and Monaragala (173/km^2), Badalkumbura (174/ km^2), Medagama (153/ km^2) and Sevanagala (238/ km^2) DS Divisions have relatively a higher density. Madulla (44/ km^2), Thanamalwila (42/ km^2))and Kataragama (33/ km^2) DS Divisions are least populated areas.

Figure 4.20: Population density in the Uva Province

178. Percentage of the female population is slightly higher than the males (Figure 4.21), and more than 65% of the populations are within the age category of 15–64 years. More than a quarter of the population is below 15 years.



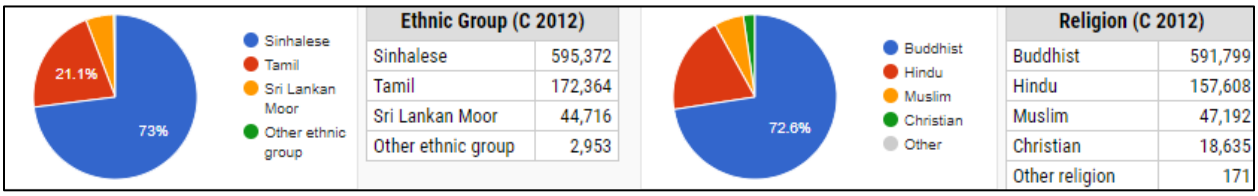
(a) Badulla District



(b) Monaragala District

Figure 4.21: Population distribution in the two Districts in Uva based on Gender and Age Groups (estimate as on 2019-07-01) Source: https://www.citypopulation.de/en/srilanka/

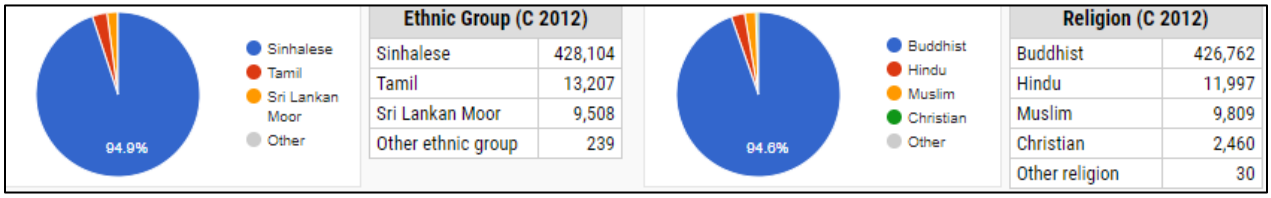
179. Majority of the population are Sinhalese (approximately 73% in Badulla and 95% in Monaragala), and about 21% are Tamils in the Badulla District (Figure 4.21).



Ethnic Group (C 2012)	
Sinhalese	595,372
Tamil	172,364
Sri Lankan Moor	44,716
Other ethnic group	2,953

Religion (C 2012)	
Buddhist	591,799
Hindu	157,608
Muslim	47,192
Christian	18,635
Other religion	171

(a) Badulla District



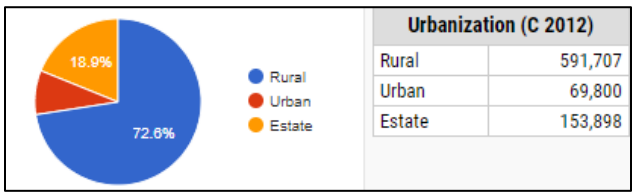
Ethnic Group (C 2012)	
Sinhalese	428,104
Tamil	13,207
Sri Lankan Moor	9,508
Other ethnic group	239

Religion (C 2012)	
Buddhist	426,762
Hindu	11,997
Muslim	9,809
Christian	2,460
Other religion	30

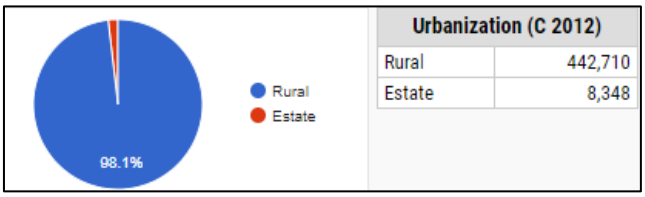
(b) Monaragala District

Figure 4.22: Population distribution based on ethnic groups and religion in the Uva Province (Census data of 2012, reproduced from https://www.citypopulation.de/en/srilanka/

180. Monaragala district shows that at least 92% of the population live in rural areas and a small percentage in estate settlements. In contrast, in Badulla district, about 19% lives in estate settlements, and about 10% lives in urban areas, and 73% lives in rural areas.



Urbanization (C 2012)	
Rural	591,707
Urban	69,800
Estate	153,898

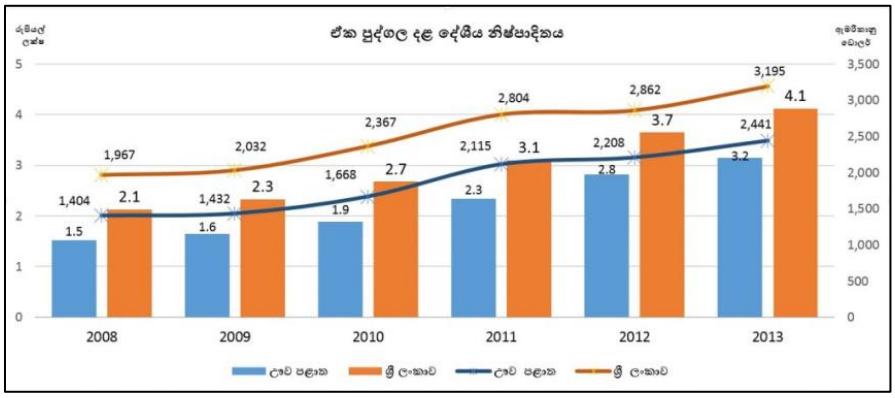


Urbanization (C 2012)	
Rural	442,710
Estate	8,348

(a) Badulla District (b) Monaragala District

Figure 4.23: Population distribution in the two Districts in Uva Province based on urbanization (estimate as on 2019-07-01) Source: https://www.citypopulation.de/en/srilanka/

181. **Economy**. The per capita income of the Uva Province (US$ 2,441) is less than the average for Sri Lanka (US$3,195) (see Figure 4.24 - 2013 Figures).



182. **Figure 4.24: Per capita income of the Uva Province in comparison with the country's average** (Source: Source- Policy Planning Department – Uva Province, 2014**)**

183. Uva Province is one of the provinces recording the highest poverty rates in Sri Lanka. Compared to the rest of the country, the poverty index of Uva province is higher than 15.4%. The poverty index in the Badulla district is 12.3%, and the poverty index of the Monaragala District is 20.8%. Median monthly income of a household unit in the Badulla district is Rs. 25,067.00 and that of Monaragala District is Rs. 20,686.00.

184. Sri Lanka's second-least-populous Province, Uva today has a modest economy largely dependent on Agriculture plantation crops tea in the hills and sugar and maize on the plains and sizeable rural agriculture of the subsistence variety, and there is little industry.

185. The contribution to national GDP from Uva province is 5.8 % (2016). The growth rate of Uva Province nominal GDP was 13.1% in 2016. A significant contribution of over 13% of the GDP in the Province derives from the primary sector which includes paddy, export crops (tea, rubber, and spices) sugar, livestock, fisheries, and forestry. The agriculture sector employs about 53.3% (2016) of the labour force in the Province. Industry 14.1% and Service sector 32.6%.

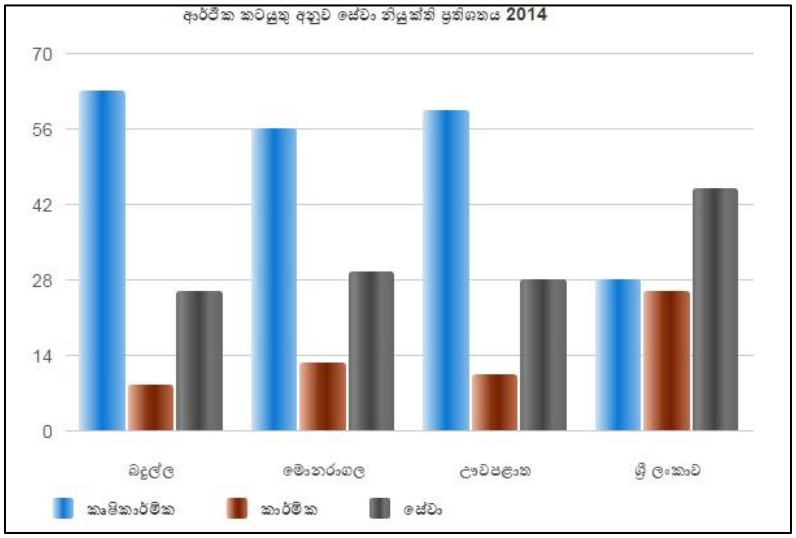


Figure 4.25: Percentage of employment provided by economic sectors
(Source- Policy Planning Department – Uva Province, 2014)

186. Agriculture is the main livelihood of over 95% of the Uva province population. According to the census of economic activities conducted in 2014 by the Department of Census and Statistics, there were 370,276 agriculture operators in the rural agriculture sector in Uva Province. Out of these, 228,654 operators were doing holdings above 40 p while 70,874 were doing holdings less than 40 p. (Total operators in Uva Province was 299,528) The total cultivated area under these holdings was 484,778 acres. Off-farm employment opportunities are scarce. All these factors led to a situation of persistent abject poverty among the population of this Province. According to calculations of the Department Census and Statistics, poverty headcount ratio in 2002 of Uva province was 37% (which was highest among provinces in Sri Lanka). Even though there has been some reduction poverty situation in Uva province in the last decade, still the poverty index of Uva province is higher than 15.4%. The poverty index in the Badulla district is 12.3%, and the poverty index of the Monaragala District is 20.8%. Median monthly income of a household unit in the Badulla district is Rs. 25,067.00 and that of Monaragala District is Rs. 20,686.00.

187. **Land use.** The two administrative districts, namely Badulla and Monaragala, are vital agricultural areas since ancient times. Uva province is a lower-middle-income region with a population of 1.3 million. Land extent is about 8,500 km^2 (7.71% of the total area of the country). There are about 200,000 farm families in 3,304 villagers. Provincial contribution to the national agriculture GDP is 30%, and Provincial gross domestic production of agriculture is 14.22% while national gross domestic production of agriculture is 6.9% (Central bank annual report, 2017). Employment in the agriculture sector is 53.3% (based on the Census and Statistics Department data for 2017). Paddy and other agriculture cultivations except plantation crops occupy 17% of the total land area of the Province (source – policy planning department, Uva province). The potential growth sectors of the Uva province constitutes crop agriculture, livestock farming and fisheries, along with agriculture-related industries and trades. Out of the total land area of the Province, 31 per cent is used for crop cultivation. Paddy is the predominant crop in the Province followed by other field crops (OFC) and vegetables and floriculture.

Table 4.6: Land use pattern of Uva Province (in 2016)

Land Use/ Land Cover			Badulla		Monaragala		Uva Province	
			Land Extent (Ha.)	%	Land Extent (Ha.)	%	Land Extent (Ha.)	%
Developed area/ Building area/ Residential area and House gardens			89,551	31.3	58,214	10.3	147,765	17.4
Agricultural land	Crops	Tea	29,762	10.4	226	0.0	29,988	3.5
		Coconut	85	0.0	3,443	0.6	3,468	0.4
		Sugar Cane	230	0.1	13,151	2.3	13,381	1.6
		Other	3,691	1.3	9,653	1.7	13,344	1.6
	Other field Crops		15,949	5.6	59,414	10.5	75,363	8.9
	Paddy		38,897	13.6	30,445	5.4	69,372	8.2
Forest			85,999	30.1	335,919	59.6	421,917	49.6
Grass Land			5,522	1.9	10,801	1.9	16,324	1.9
Internal Waters			13,273	4.6	24,868	4.4	38,141	4.5
Rocky Land			3,141	1.1	17,765	3.2	20,906	2.5
Total Land			286,100	100.0	563,900	100.0	850,000	100.0

Source- Policy Planning Department – Uva Province, 2019)

188. **Education.** There are 36 national schools, 864 provincial schools, 63 pirivenas, and four private schools functioning in the Uva Province (2017 data).

Table 4.7: Number of governmental (national and provincial) schools in the Uva Province

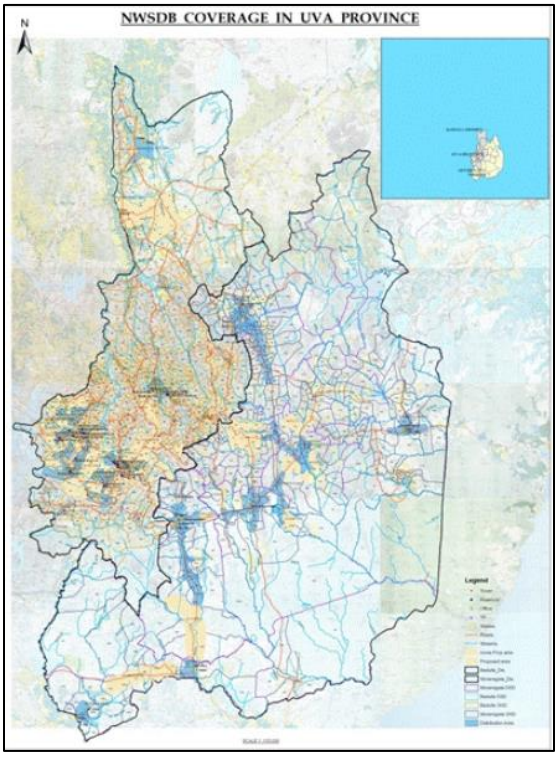
No	Category	Description	No of Schools
1	1AB Schools	Schools with classes up to Grade 13 including GCE (A/L)Science, Arts and Commerce streams	83
2	1C Schools	Schools with classes up to Grade 13 with GCE (A/L) Arts and Commerce streams	178
3	Type II Schools	Schools with classes up to Grade 11	291
4	Type III Schools	Primary Schools with classes up to Grade 05 or Grade 08	348

189. **Health and Sanitation.** *Curative healthcare services* in the Province are being provided to the community through a network of primary, secondary, and tertiary care institutions. These include two tertiary care institutions, six secondary care institutions and 85 primary care institutions. Out of these, 90 institutions come under the administration of the Provincial Department of Health Services. Provincial General Hospital (PGH), Badulla and District General Hospital (DGH), Monaragala are the two health care institutions in the Province that provide *tertiary care services* to the Province. Both these institutions come under the Line Ministry Administration.

190. *Secondary healthcare services* are provided to the Province by six Base Hospitals, namely MH-Diyathalawa, BH-Mahiyangnana and BH-Welimada in the District of Badulla and BH-Bibile, BH-Wellawaya and BH-Siyambalanduwa in the District of Monaragala. These institutions provide primary specialist care and some specialist clinic services as well as laboratory and radiology facilities to their respective communities.

191. *Primary health care services* are delivered through Divisional Hospitals (DH) and Primary Medical Care Units (PMCU) in the Province. Primary Medical Care Units (previously known as Central Dispensaries) provide outpatient care for health care seekers coming to those institutions. There is a total of 26 PMCUs in the Province.

192. *Preventive health services* in Uva Province are being provided to the community by the Medical Officer of Health Units. There are 27 MOH areas in the Province - 11 MOH areas in the District of Monaragala and 16 MOOH areas in the District of Badulla. A Medical Officer of Health is the officer in charge of each MOH area. The services provided through a MOH office are those of MOH office itself as well as those provided at out-reach clinics covering the entire MOH division. These out-reach clinics are mainly conducted in Gramodaya Health Centers (GHC) scattered in the MOH division. Besides, the field officers provide domiciliary care visiting all houses in their respective areas.



193. **Water Supply.** Uva province comprises of two districts, viz., Badulla and Monaragala. Under the supervision of Deputy General Manager Regional Support Centre, Regional Office, Bandarawela and Regional Office, Monaragala is functioning with 20 water supply schemes and 11 water supply schemes, respectively.

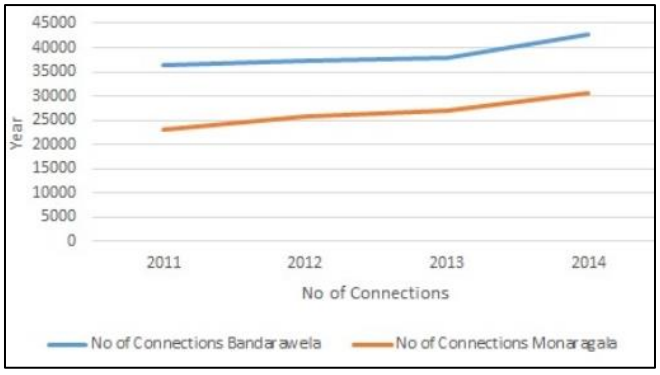
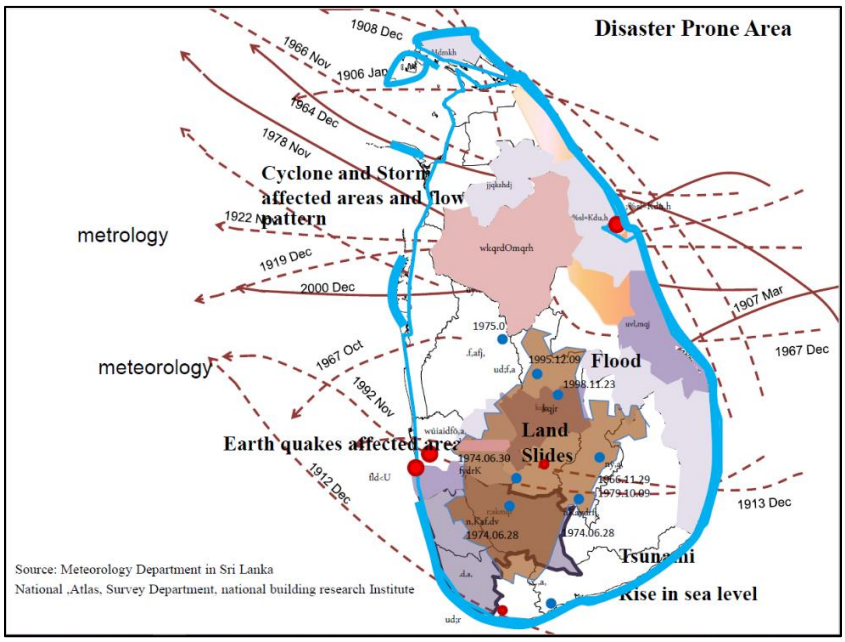


Figure 4.26: NWSDB coverage in the Uva Province and number of connections managed by the two regional offices

194. **Roads and Transport.** By the Gazette published in 2014 total road length, 2,385 km is under the purview of Uva Provincial Road Development Department. The department has six divisions, viz., Badulla, Diyathalawa, Welimada, Mahiyanganaya, Monaragala and Wellawaya to monitor the provincial roads. Each division has a Divisional Engineer who has the responsibility to manage divisional roads.

195. **Electricity.** Presently 100% access for electricity is ensured in Western and Southern provinces. However, in Uva, 4% of the total households in the Province are still unable to get the electricity supply from the national grid.

E. Environmental Sensitive Areas and Natural Disasters



196. **Cyclones.** As indicated in Figure 12, many cyclones have passed over the country. Storm surges are more frequent on the east coast of Sri Lanka compared to the other parts of the island. The cyclones which occurred in the past have caused extensive damage, especially in the eastern part of Sri Lanka. However, the southeastern part of Sri Lanka, including the Uva Province has not affected much, and the incidences of disaster situations due to cyclones are low.

Figure 4.27: Map showing areas which are vulnerable to disaster in Sri Lanka

197. **Floods:** Occurrences of floods in the Uva Province is low. Exposure of infrastructure in Uva has been categorized as No Vulnerability, other than a small area in the north of the Province (See Figure 4.29), Extreme flood event records show that Uva Province (both Badulla and Monaragala Districts) has experiences 16–27 flood events during the period of 1990–2011 (Figure 4.30). This can be considered as low incidence scenario. Vulnerability of infrastructure to the expected increase in frequency and intensity of floods due to climate change is widespread and prevalent in many parts of the country, however, Uva Province (Badulla and Monaragala Districts) has been categorized under No Vulnerability.

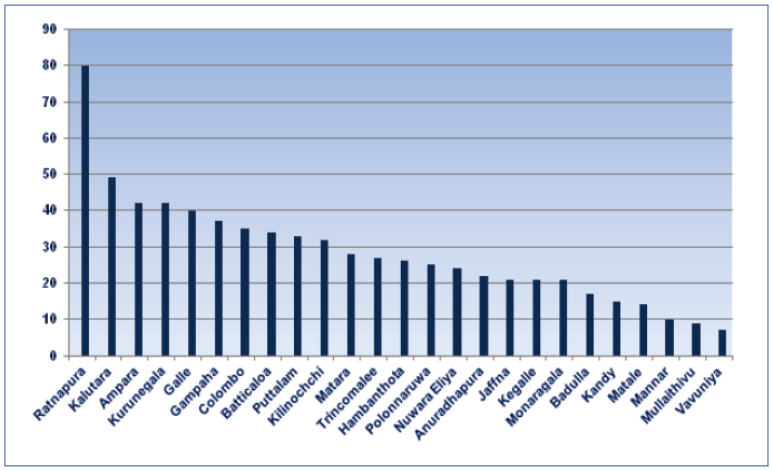


Figure 4.28: Flood occurrence by District (1990 to 2011)

198. **Landslide exposure.** With climate change, the vulnerability of infrastructure to landslides is expected an increase in frequency and intensity and is focused mainly in the central hills (Figures 15 and 16). These figures highlights that there are areas in Badulla District which are exposed to Moderate, Low and Minimal Vulnerability. Landslides have been frequently experienced in some parts of the Badulla District (Figure 4.31 and 4.32).

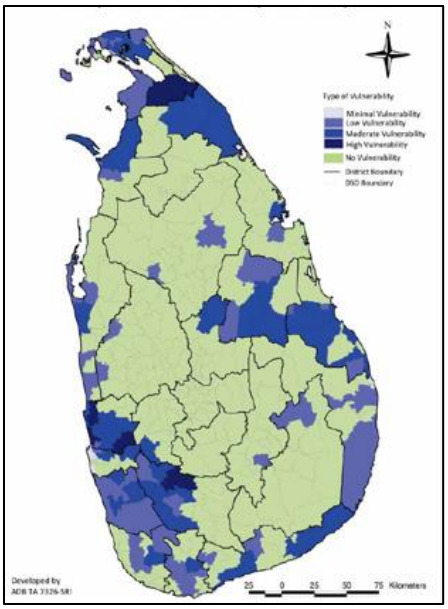


Figure 4.29: Districts where infrastructure vulnerable to flood exposure due to climate change Source: ADB TA-7326 Sri

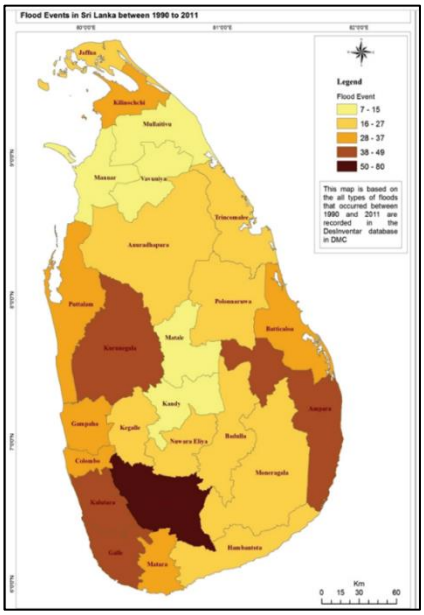


Figure 4.30: Extreme flood events occurred during 1996–2011 Source: Hazard Profiles of Sri Lanka (UNDP, 2011)

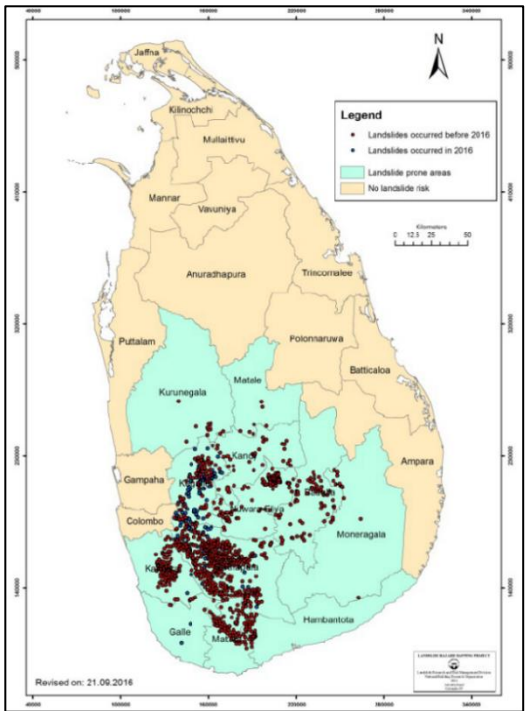


Figure 4.31: Areas which have experienced landslides. The areas in blue indicate the areas prone to landslide risks

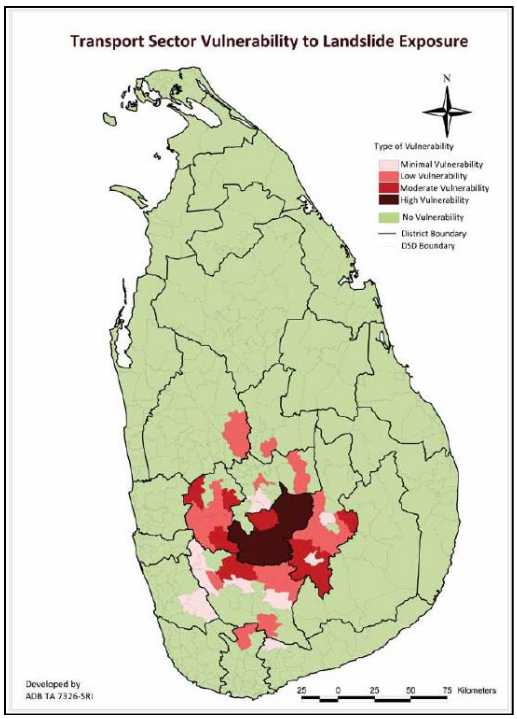


Figure 4.32 Areas prone to landslide risks and expected to exacerbate with climate change. Source: ADB TA-7326 Sri

199. **Droughts.** Much of the Monaragala District and part of Badulla District are relatively dry and are located within the Intermediate and/or Dry Climatic zones of Sri Lanka. Figures 4.33 show that much of the areas of Badulla and Monaragala had more than 200 days, where daily rainfall < 1.0 mm).

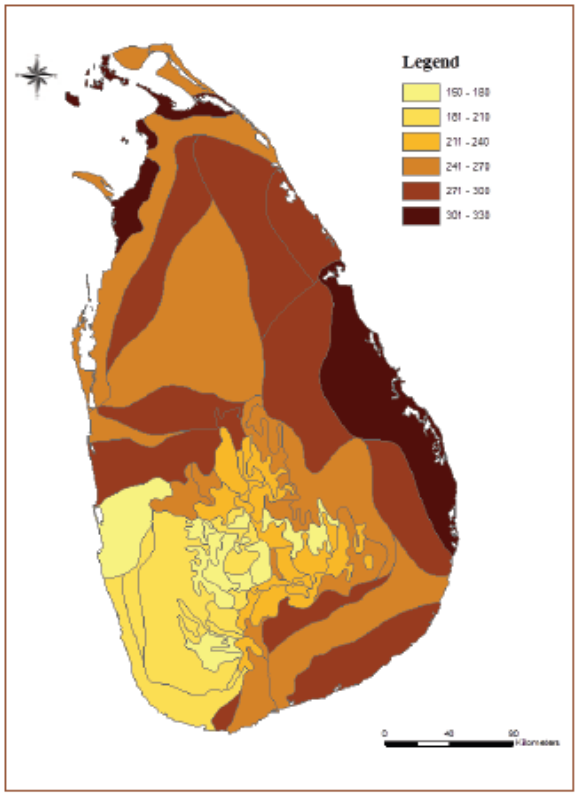


Figure 4.33: Mean number of days per year where daily rainfall has been less than or equal to 1.0 mm Source: Hazard Profiles of Sri Lanka (UNDP, 2011)

200. One disadvantage of the geographical location of Uva Province is that it is in the leeward side of South West Monsoon winds which brings high rainfall during May-September period to the western side of the hill country of Sri Lanka. The SW monsoon winds pass the central mountain ridge and enter Uva Province as a dry and gusty wind. Most of the Province experiences a long and severe drought period during May– September. A major part of the Eastern and Southern low land area of the Monaragala district and Northern low land part of Badulla district has become a dry zone due to this effect**.**

201. **Environmental Sensitive areas.** Figures 4.34a and 4.34b show the environmentally sensitive areas in Badulla and Monaragala District and the locations of the sub-projects.

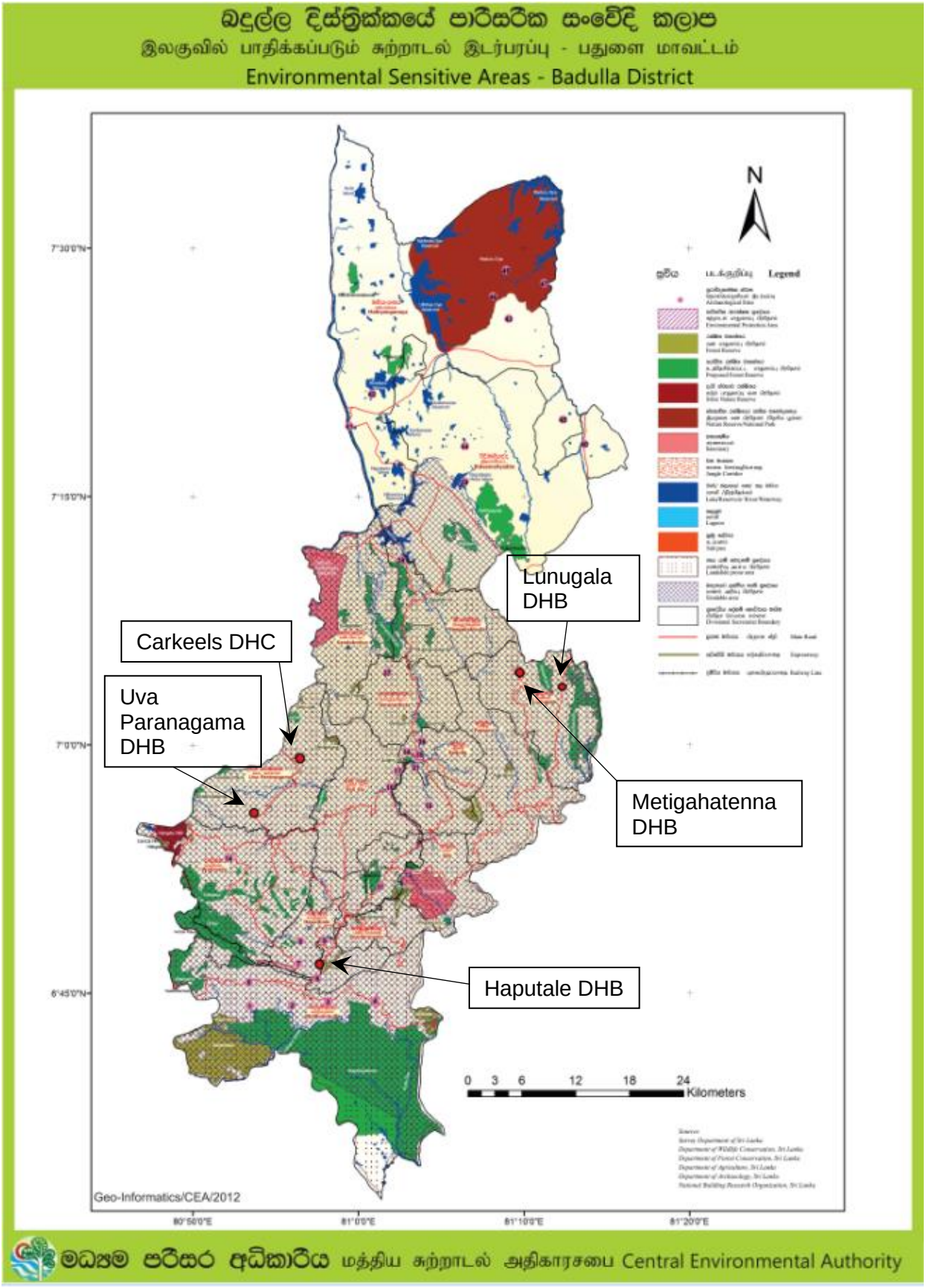


Figure 4.34a: Environmental Sensitive Areas in Badulla District & sub-project locations

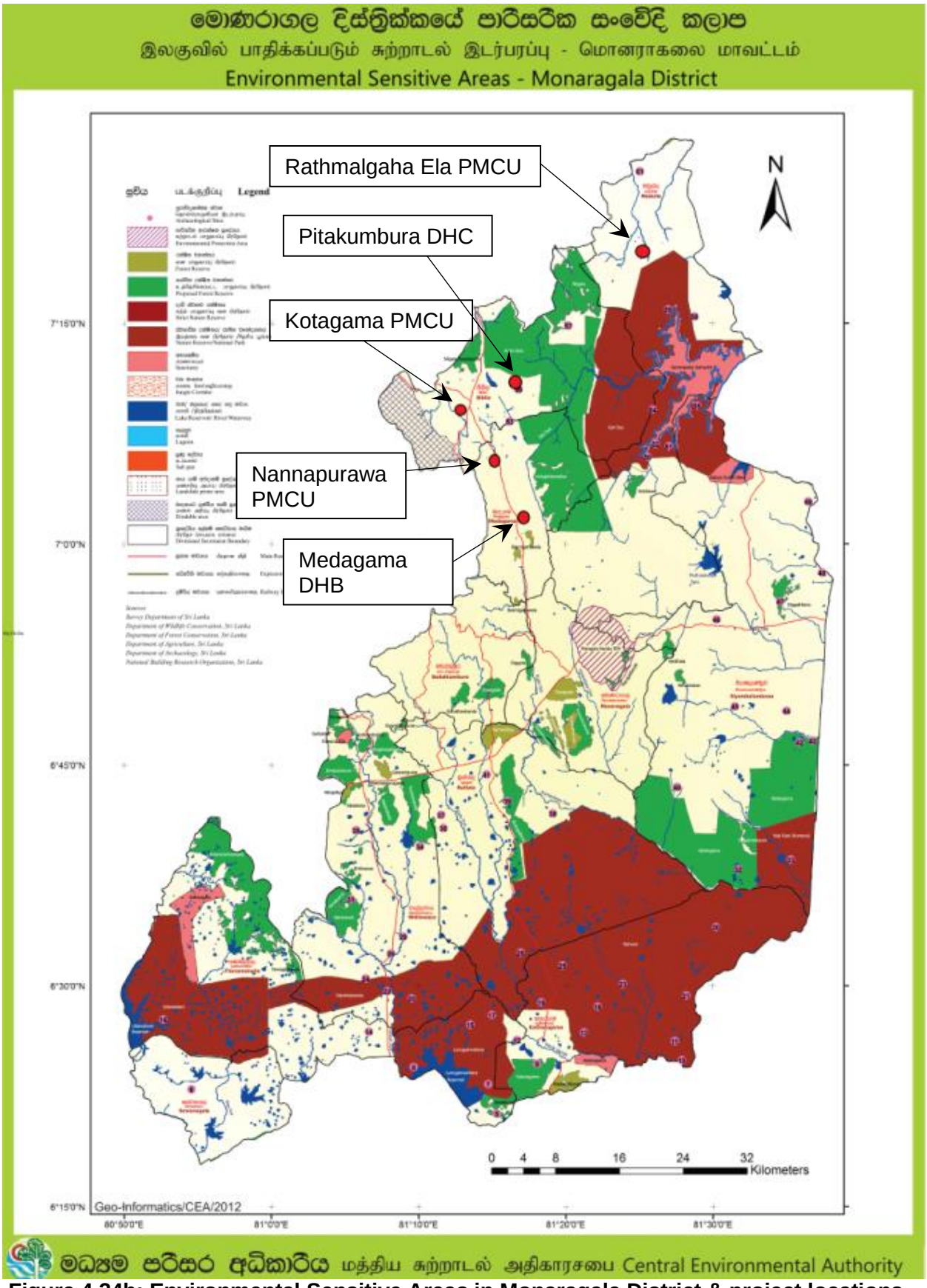


Figure 4.34b: Environmental Sensitive Areas in Monaragala District & project locations

V. Anticipated Environmental Impacts and Mitigation Measures

A. Screening of potential impacts

202. Potential environmental impacts of proposed civil works components are presented in this Section. Mitigation measures to minimize/mitigate negative impacts, if any, is recommended along with the party responsible for implementation. Monitoring activities to be conducted during the implementation phase are also recommended to reduce/mitigate the impact. Impacts and mitigation measures are presented in the following order.

203. Screening of potential environmental impacts is categorized into three categories considering subproject phases: (i) planning and design impacts (pre-construction phase), (ii) construction phase impacts, and (iii) operations and maintenance phase impacts.

(i) Planning and pre-construction impacts include impacts associated with site selection (location-specific impacts) and include loss of on-site biophysical array and encroachment either directly or indirectly on adjacent environments. It also includes impacts arising from project design, including technology used, the scale of operation/throughput, waste production, discharge specifications, pollution sources, and ancillary services.

(ii) Construction impacts include impacts caused by site clearing, earthworks, machinery, vehicles, and workers. Construction site impacts include erosion, dust, noise/vibration, traffic congestion, and waste production. In addition, the safety of workers and the public are also considered.

(iii) Operation and maintenance impacts include impacts arising from the operation and maintenance activities of the newly built facility at each hospital. These include routine management of operations of the hospital building and functional spaces, and occupational health and safety issues.

204. Screening of environmental impacts has been based on the impact magnitude (negligible/moderate/severe, in the order of increasing degree) and impact duration (temporary/permanent).

205. This Section of the IEE reviews possible project-related impacts, to identify issues requiring further attention and screen out issues of no significance. ADB SPS (2009) require that impacts and risks will be analyzed during pre-construction, construction, and operational stages in the context of the project's area of influence. Categorization of the project and formulation of mitigation measures have been guided by ADB's Screening Checklist for Health Care Facilities (HCFs) (Annex 1).

206. **Methodology.** Identification and assessment of impacts have been carried out by considering the proposed activities during pre- and construction and operational stages. Issues for consideration have been raised by the following means: (i) input from interested and affected parties; (ii) desktop research of information relevant to the proposed project; (iii) site visit and professional assessment by the Environment Specialist engaged by the PMU of HSEP; and (iv) evaluation of proposed design scope and potential impacts based on the Environment Specialist's experience and value judgment. The impacts of the activities will be described separately on physical, biological/ecological, socio-economic, and cultural resources within the zone of impact. Impacts that may result from proposed sub-project can be (relatively) adverse during construction, however, significantly beneficial during the operational stage.

207. Mitigation refers to the measures that are designed to cope with adverse consequences and to enhance the positive impacts on the environment as a result of the sub-project implementation. Effective implementation of benefit maximization measures and adverse impact mitigation measures would optimize the benefits expected from the sub-project and

avoid/minimize the adverse impact from the sub-project. The impacts have been predicted regarding their magnitude (minor, moderate and high), extent (site-specific, local, and regional) and duration (short-, medium- and long-term) and appropriate benefit enhancement and mitigation measures are suggested in following sections.

B. Planning and pre-construction and location-related impacts

B.1 Proper scheduling and planning of work

208. Scheduling of work associated with the selection of sites, including effects on the functioning of the health care facility and the surrounding environment,

209. The site selected for implementing the sub-project is owned by the individual HCF. None of the land plots has any encroachments or other socio-economic activities that would be affected by implementing the project. No land acquisition is envisaged; therefore, there will be no physical or economic displacement leading to involuntary resettlement of people.

210. The winning contractor will bid based on the concepts and details included in the bid documents. The bidders will be advised to make their due diligence study before bidding. Necessary documents and study reports will be made available to them for their evaluation. It will be up to the bidders to maximize the use of resources made available to them. The following criteria are salient features that the winning contractor is expected to follow (Table 5.1).

Table 5.1: Aspects to consider during planning of sub-projects to avoid and/or mitigate environmental and social impacts

1. Minimization of work delays due to improper planning	
- Proper coordination to ensure timely project completion and - Minimizing work delays due to not obtaining prior approvals/ consents, etc.	Scheduling, coordination, procurement, obtaining approvals[20] and project implementation will be expedited to the practicable extent. Standard and sound construction practices will be followed at all times. The possibility of deploying several gangs simultaneously should be pursued, which will allow the work to be completed within the least possible duration.
- Minimizing delays related to the selection of locations for project interventions	The Contractor is expected to liaise closely with the DSC, and the PIU to avoid any delays.
- Selection of areas for work camps, stockpile areas, storage, and disposal areas	Priority should be given to people in the project area when selecting workers. If labour camps are needed, the preferable option is to locate these near the subproject locations. Sites to be considered will result in the least damage to property, vegetation, and least disturbance to the HCF and the neighbourhood, including the traffic. The Contractor is expected to liaise closely with the DSC when selecting such sites.
- Solving any issues that lead to delays in the finalization of the designs of the interventions	The Contractor is expected to liaise closely with the DSC, and the PIU to avoid any delays. and any approvals and consents shall be obtained without delay

[20] See Table 1.4: Obtaining Permits/approvals/consents/no-objection letters for sub-projects

- Planning the work with due consideration given to climatic conditions	Some areas receive considerably high rains, and some areas are prone to local flooding and high erosion. Rainfall and runoff in project areas may cause disruption or damage to ongoing works and cause public inconvenience. Furthermore, climatic conditions play an important role in dispersing noise/air pollutants. Seasonal climatic conditions have to be considered for scheduling construction activities.
2. Plans to ensure health and safety aspects are in place in compliance with Standard Practice	
- Health and Safety of workers	Due consideration shall be given to Environmental, Health, and Safety (EH&S) aspects. Selection of locations and facilities for labour camps will be reviewed by the DSC. Compliance with EH&S requirements[21] (including measures to prevent spreading COVID-19) will be thoroughly reviewed, and a summary requirement shall be prepared (one for workers and another common one for the public, including the workers) by the Contractor.
- Public Safety	
3. Optimal use of resources, waste management and minimization of physical impacts	
- Method of construction	All the works connected with building construction and provision of services will be carried out according to approved Standard Methods and Drawings.
- Selection of construction material, fittings, and fixtures	The Contractor is expected to liaise closely with the DSC, and the PIU to avoid any delays. Building materials shall be procured from reputed suppliers who have obtained proper approvals for material sourcing.
- Labour gangs	Recruitment of labourers, both unskilled and skilled, from the locality, will reduce the need for having large labour camps and will lead to lesser impacts due to such labour camps during the construction stage.
- Noise and vibrations	Time of operation of construction equipment and vehicles engaged in the transportation of construction materials will be planned well so as not to disturb the activities of the HCF.
- Air quality	Dust and gaseous emissions are expected during construction (e.g., transportation, excavation, construction activities, and stockpiling). Proper planning of construction and transport activities shall be a priority. Proper mitigation methods shall be adopted to control obnoxious gases, and dust generated if any.
- Drainage and Hydrology	Sections of the new constructions need careful planning to avoid local flooding and any negative impacts. Other project components are not expected to have any negative impact on the rainwater drainage of the HCF premises. Any

[21] Refer Chapter II, Section A.1 (6) for details, including Annex 9

	alterations to existing drainage canals should be done with proper planning.
4. **Avoiding ecological impacts**	
- Loss of VEC and impacts on the natural environment	All the project components are proposed on lands which do not have any ecologically sensitive ecosystems. There are no interventions/activities proposed in areas of ecological diversity.
5. Minimizing Social Impacts	
- Obstructing access to the facilities of the HCF	Alternative routes shall be provided, if possible. If there are no alternative routes, access routes within and to the HFC shall never be obstructed at all times regardless of any reason. This has to be taken into consideration during planning.

B.2 Minimizing the removal of trees

211. Selection of the site and the building footprint have been finalized by the DSC after visiting each of the hospitals, conducting discussions with the hospital authorities and the PIU. The best alternative has been selected to satisfy the needs of the hospital authorities and the users, and also to avoid removal of trees to the extent that is practicable.

212. See Chapter 4 for details of the trees that needs removal.

B.3 Avoiding impacts due to landslides and slope instability

213. The site selection has been finalized by the DSC, considering the potential impacts that can arise due to land instability and landslides. The sites have been selected to minimize such incidences; however, slopes have to either stabilized or strengthened in a few sites by way of construction of proper retaining walls or any other suitable measures. Such sites include new civil works proposed for:

- Carklees DHC, where the new building will be constructed after cutting of sloping terrain
- Uva Paranagama DHB, where the embankment located behind the building to be renovated is unstable
- Metigahatenna DHB, where a retaining wall is needed towards the front boundary of the new building
- Haputale DHB where the embankment between the existing drainage canal and the proposed building needs strengthening
- Lunugala DHB where the embankment at the rear boundary of the proposed site needs a certain amount of scraping and cutting

214. The sites, as mentioned above, need structural or non-structural interventions as appropriate to ensure slope stability and safety of the building/users of the hospital facilities.

215. Sites in Monaragala District may need small amounts of cutting and filling; however, impacts due to landslides and slope instability is not applicable.

216. Recommendations of the NBRO should be obtained for projects in Badulla District.

B.4 Planning for interruption of services of the HFC due to the demolition/ removal of any existing structure/part of structures of the HCF

217. Removal of parts of the structures is needed for some HFCs (e.g., Rathmalgaha Ella and Pitakumbura), demolition of existing old structures are needed for Lunugala and Metigahatenna. Complete renovation of buildings is needed at Medagama and Uva Paranagama. Close coordination with the HCF authorities is needed so as not to disturb the day-to-day activities of the HFC. The hospital authorities should be given prior notice of the activities of the Contractor so that any shifting of service functions (that are affected by renovations, removal/demolition work) and re-scheduling of the work of the hospital can be done.

218. Any interruption of utility services (water supply, wastewater collection and disposal, electricity, telecommuting services) should be restored with alternative means. Also, the functional connectivity of different hospital units needs to be restored for uninterrupted services of the hospital.

B.5 Designing of proper stormwater drainage systems

219. The rainwater drainage has to be designed appropriately for all the site before commencement of the work. Any alterations, damages, blockages caused to the existing drains should be considered in providing alternative drainage pathways.

220. The Contractor should obtain proper guidance from the DSC on such matters (see Section C.8 of this Chapter for details).

B.6 Designing of proper healthcare waste (HCW): sorting, storage, and disposal

221. Safe handling of HCW during collection, storage, transportation, treatment, and disposal of HCW is of paramount importance. Designs and plans for such safe handling and disposal of HCW have to plan early.

222. Note: This aspect is supposed to addressed separately as another activity under the HSEP and will be reported elsewhere (reference will be provided once the reports are available).

B.7 Designing of a wastewater treatment system

223. Wastewater generated from the newly constructed facilities needs to be disposed of appropriately. Design of an adequate wastewater collection and on-site treatment system shall reduce such contamination.

B.8 Planning for provision of adequate and uninterrupted electricity, water, and telecommunication facilities.

224. Any interruption of electricity, water and telecommunication facilities to the laboratory shall interrupt the operations of the newly constructed sections of the hospital and even cause damage to equipment.

225. The proposed facilities should be supplied by an appropriately laid out and designed electricity connection, water supplies, wastewater collection and disposal, and telecommunication facilities. Impacts during construction

B.9 Conducting surveys prior to commencement of the proposed civil works

226. The following surveys must be completed before the start of construction:

(i) Land surveys and contour map of the proposed land plot – This is to be carried out by a licensed surveyor. The survey plans may be needed for subsequent approvals. Contour maps are needed for the design of the building and setting the formation levels.

Note: Land survey plans and contour maps have been finalized as of June 1, 2020.

(ii) Initial status photography and video and crack survey – This is to be carried out by the contractor with the participation of engineers of the DSC. The objectives are to record all existing conditions of structures of nearby buildings and the periphery that are likely to affect during construction due to physical impacts (e.g., dust, vibration damage, drainage impairment, etc.). Any damage that may happen to structures and services during the construction phase can be accurately identified and compensated (for hospital authorities and/or the contractor, as the case may be) using this information.

(iii) Existing survey of utilities and shifting – This is to be carried out by the contractor before site clearing. Water supply, wastewater collection and disposal, electricity and telecommunication connections, rainwater drains that needs shifting should be identified at this stage and shifting should be carried out in consultation with the Engineer/DSC and the hospital authorities.

(iv) Visual surveys of the peripheral areas of the site – All the sites are located within existing hospital premises. Therefore, most of the sites are located in confined spaces where patient/hospital activities are predominant. Any obstruction to the movement of the ambulance, and vehicular access to the hospital premises, movement of patients within the hospital premises should be avoided entirely. Therefore, site planning is of utmost importance. Therefore, a visual survey has to be carried out collectively by the engineers of the DSC and PIU and the contractor. The objectives are to decide locations for material/spoil storage yards, labour huts/camps, temporary parking areas for construction vehicles not to disturb the functions of the hospital in whatsoever manner.

B.10 Community and public awareness

227. Careful planning and extensive coordination with hospital users (most importantly, the hospital staff and the patients) must be established. Information transfer related to construction schedules must precede any site activity in order to make the public aware of the extent of the problem that might be present during the period of construction, mainly caused by changes of the entrance to the hospital, changes of units/venues of the hospital, dangers posed by construction-related activities and how to avoid such incidences, impacts such as dust and noise, etc. should be appropriately announced. The contractor has to coordinate this with the hospital authorities.

C. Impacts anticipated during the construction phase and mitigation of impacts

C.1 Impacts due to site preparation activities

228. Construction activities envisaged under the project can be categorized as small-scale with impacts that are localized, temporary, and easily manageable with good construction practices.

229. The sub-project activities will involve the construction of the foundation and erection of the building (small-scale building construction, demolition or rehabilitation of existing buildings, construction and provision of services including toilets/washrooms together with septic/soakage tanks and rainwater drains). The proposed construction and/or rehabilitation work is restricted to a relatively small expansion of the existing building footprint (approximately 800–900 sq. feet) within hospital-owned premises.

230. Out of the sites in the Uva Province, Carklees site needs moderate amounts of cutting and site clearing. This sloping and hilly site needs site preparation with caution to ensure that ground cover, especially on slopes, is not removed unnecessarily. Lunugala and Metigahatenna need demolition and removal of existing dilapidated buildings. All other sites, Nannapurawa, Kotagama, Rathmalgaha Ella, Pitakumbura and Haputale sites need the removal of ground

vegetation and removal of small to moderately large amounts of topsoil. The sub-project in Medagama DHB is only for rehabilitation of an existing building; however, the land for material/spoil storage, labour huts, etc. may need land clearing. Land clearing will produce reasonably large amounts of topsoil and vegetative matter. The need for cutting trees have been detailed in Chapter 4.

231. Land preparation and removal of vegetation will result in minor to moderate impacts due to the alteration of the existing drainage pattern of the hospital premises.

Measures to mitigate the impacts

- Removal of vegetation on-site should be restricted to the bare minimum, and a strip of vegetation (at least 1 m in thickness) should be left around the disturbed area.
- Erosion control during land preparation activities and cutting/filling within the site premises need attention. Rainy periods should be avoided to the extent possible for land clearing. If rains occur as unexpected events, then erosion control should be considered. Surface runoff should be diverted away from the site and/or construction site, and drainage should be diverted through silt traps (if needed). Any loose soil within site should be compacted as soon as possible, and soil/spoil heaps should be kept covered all times.
- Material transport in steep roads should be done with care as the access roads to some sites have high gradients (Haputale, Lunugala, Metigahatenna, Carklees sites).
- The spoil heaps should be kept covered and should not be exposed to rain and/or wind.
- Re-use of excavated material is an excellent option to reduce the quantity of spoil being transported. Wherever possible, surplus spoil will be used to fill eroded gullies and depressed areas, etc. within the hospital premises (which has to be done with the consent of the hospital authorities). Any rocks and good quality soil can be used for backfilling and levelling.
- Tree barks, stumps and wood debris can be distributed to be used as firewood to local people free of charge. Trees that are of commercial value should be felled by the Timber Corporation, and the timber should be disposed of according to their instructions. If such trees are being cut, proper consents/approvals need to be obtained from hospital authorities and Divisional Secretariat, as appropriate and inform the Timber Corporation to remove the tree. The contractor needs to coordinate this, and all original hard copies of consent letters and other correspondence should be lodged with the hospital authorities for record-keeping.

  Note: No commercially valuable tree species were found within any of the site premises. However, it is the responsibility of the contractor to verify this.
- Excess spoil should be disposed of at specified tipping sites in a controlled manner. Spoils should not be disposed on sloping areas, marshy areas, public places, and the roadside and should not obstruct natural drainage paths, canals, and other infrastructures. The temporary debris storage sites should not be located in a manner that obstructs hospital facilities. Proper consents/approvals need to be obtained from hospital authorities and Grama Niladari and/or Divisional Secretariat, local authority, as appropriate, for transportation of spoil and excess soil out of the site premises. The contractor needs to coordinate this, and all original hard copies of consent letters and other correspondence should be lodged with the hospital authorities for record-keeping, including record indicating how the spoil and excess soil has been disposed of.

C.2 Impacts due to the demolition of buildings and other structures

232. The proposed project sites at Lunugala and Metigahatennea presently consist of old buildings that need demolition. Proposed work at Uva Paranagama and Medagama involve rehabilitation of buildings including demolition of internal walls, and roofs/ceilings. Proposed work at Rathmalgaha Ella, Kotagama and Pitakumbura include alteration of existing premises that involves some amount of demotion of walls and parts of the roofs/ceilings. The first phase of all these civil works involve**s** demolition work.

233. Demolition of the existing buildings and/or parts of existing buildings and related facilities could generate high levels of dust and noise, therefore can create potential inconveniences and health-related impacts to patients, other occupants of the hospital premises (including hospital staff), and workers. The use of machinery in the demolition activities may create high levels of noise and vibration, affecting the people occupying the hospital premises (especially the OPD, ETU and Clinic areas which have heavy people movements). The patients and hospital staff who occupy the hospital premises during construction will have to endure such inconveniences for long hours, especially in patients who are more sensitive for such impacts, mainly if demolitions take place in the proximity of ward premises.

234. Demolition of existing structures produces fine particles, which are prone to wash away with surface drainage. Clearing of the topsoil will generate a large amount of sand and soil material, which again needs storage. Such material, if exposed to surface runoff, will lead to erosion and siltation of drainage paths.

235. Transportation of demolished and residual material for disposal could cause inconvenience to the neighbourhood due to the noise, traffic, and potential creation of dust, if not planned well. Loading and unloading of excavated material under dry conditions may cause dust emissions, creating an aesthetically unpleasant environment, and health hazards for hospital users. Movement of vehicles within hospital premises also pose risks to hospital users if the transportation activities are not well managed.

236. The temporary storage of demolished material and parking of transport vehicles may obstruct circulation paths and access roads to and within the hospital premises, especially any obstructions caused for emergency access to the hospital premises.

237. **Asbestos Cement management:** Demolition and renovation work of buildings will generate asbestos cement waste from roofing and ceiling sheets. It is expected that a significant amount of asbestos waste will be generated at Medagama DHB as the asbestos cement ceilings and the asbestos cement roof needs replacement. Renovations and demolition of parts of the Rathmalgaha Ella PMCU, Kotagama, Uva Paranagama (demolition of the ceiling in front of the ETU) will generate small quantities of asbestos cement waste.

Measures to mitigate the impacts

- The state and the scale of the existing buildings that need demolition, alteration, renovations are shown in the photographs attached in Chapter 3. Most of the building materials of the demolished buildings, fittings and fixtures removed during renovations can be re-used (i.e. doors, windows, timber, roofing materials, and bricks). The contractor, as part of the Construction Waste Management Plan (C-WMP), should provide estimated quantities of demolished material and clearly identify opportunities for reuse and recycle and a disposal plan for residual demolished material.
- The contractor has to consult the hospital authorities after careful removal of such reusable/recyclable material and handover to the material stocks to them. It is the

responsibility of the contractor to keep records of such material that are handed over to the hospital authorities.

- Paving materials of the buildings (i.e. floor tiles), rubble work, plastering and weak masonry sections and concreted structures, broken roof tiles, once demolished may not fall into the useable category, other than to be used for landfills. Removal and disposal of all such demolished material (that cannot be reused/recycled) will be the responsibility of the contractor. The contractor needs to obtain all the approval from the relevant Government authorities for the disposal sites. During the transportation of such materials, the trucks should be covered to prevent any spills and dust.
- There should be no open burning of any demolished material, on-site or offsite.
- Demolished material such as broken ceramic fittings and fixtures, parts of electrical wiring and plumbing material, other metal items, plastic items, etc. may need to be disposed of separately. The contractor should consult the local authority for the disposal of such material.
- Discarded asbestos cement (AC) sheets should be handled and disposed of with extreme care. For material containing asbestos cement, the following should be followed.
    - Breaking the AC sheets while dismantling should be avoided or minimized.
    - If the sheets are bolted in place, bolts should be dampened and cut while avoiding contact with the AC.
    - Large pieces should be slowly lowered to the ground but not dropped or used as rubble.
    - Once removed, the sheets should be wetted to minimize asbestos fibre getting air-borne.
    - The removed sheets should be stacked carefully on-site temporarily away from areas that are used by people and covered in thick polythene sheets.
    - Remove the sheets to a permanent store either within the premises or in a central location for all AC waste in the district/province. Such sites should be identified prior to the commencement of demolition activities.
    - Transport should be done carefully with the sheets covered in thick polythene or tarpaulin.
    - Finally, transport the AC sheets in bulk to Sri Lanka's first licensed sanitary landfill cell in Aruwakkalu once it is commissioned (or a suitable location after consultations with the local authority and/or the Central Environmental Authority).
    - Workers should be given training on handling AC sheets and be provided with masks and gloves to protect themselves.

238. Refer to Annex 5 for guidelines on managing asbestos waste.

C.3 Impacts on soil due to excavation, transportation and storage of construction material and disposal of spoil and construction debris

239. Sire clearing, excavation for foundations, stockpiling of excavated material and spoil, stockpiling of construction material and construction debris etc. are all expected to give rise to increased risk of soil erosion from the sites during wet weather, especially during the northeast monsoons (months of October–January) and especially the month of April), when first inter-monsoons and convectional rains, which are torrential in nature, are expected. Since the

construction areas are relatively small and limited to one particular location, the impact is short-term and not expected to be significant. Moreover, the foundation construction will be over within a short period, and surface runoff is not expected to be severe as the project area is small. Moreover, such impacts are not severe for sites in Monaragala as the lands are mostly flat terrain.

240. Impact on soil could also occur due to construction machinery/vehicles operated at the site premises after the topsoil is already removed. Soil contamination may also result from the improper storage and disposal of concrete, chemicals such as paints/solvents and other hazardous material. As the nature of construction envisaged is small, and the duration to be short, these impacts are not significant as the use of construction machinery and vehicles will be minimal.

241. Disposal of spoil (excess earth from excavations) with fine particles susceptible for washout) can lead to washout of loose soil/particles causing erosion and siltation of drains/waterways. Large scale excavations/cutting of embankments are not expected for most of the sites the project (except for Carklees), and hence the quantity of excess soil requiring disposal will be very much less. For some of the hospitals, the excess earth (if any) can be levelled off on-site or elsewhere within the hospital premises. There are no natural streams or waterways have been observed for any of the sites, except for Rathmalgaha Ella where there is an irrigation canal located next to the hospital premises. However, the site is on the opposite side of the premises, and the impacts due to construction on this canal are not envisaged.

242. These impacts would be general to all sites given a similar type of design and construction envisaged.

<u>Mitigation measures to avoid impacts on the soil environment</u>

(i) Removal of vegetation on-site should be restricted to the bare minimum, and a strip of vegetation (at least 1 m in thickness) should be left around the disturbed area.

(ii) Earth stockpiled on-site should be fully covered on all sides with a suitable material, and weight should be placed at the base to prevent the cover from getting displaced and exposing earth to erosion. They should be stored away from site/road drainage paths.

(iii) Drains bringing in stormwater towards the construction area should be prevented with earthen/sandbag berms during wet weather. Construction should be scheduled in a way that earthwork such as excavations, cut and fill are carried out during the dry period.

(iv) On hilly terrain, vulnerable slopes in the disturbed areas should be covered with mulch or plastic sheets fortified with a weight such as sandbags or rocks or a silt fence should be erected at the base of the slope where it tapers to a drain or road. This is particularly applicable to sites in the Badulla District (Carklees, Haputale, Metigahatenna, Uva Paranagama, Lunugala). Retention walls shall be constructed on unstable slopes, before the commencement of hospital construction work (may be applicable for Carklees, Haputale, Metigahatenna, Uva Paranagama, Lunugala).

(v) Construction should be scheduled in a way that earthwork such as excavations is carried out. In contrast, all the preparations for foundation construction and pipe works, septic tank and soakage pit construction are ready to commence immediately after excavations are over. This will allow the backfills to be completed without delay and minimize the need to stockpile the spoil/soil for a longer duration.

(vi) Explore the possibility of using ready mix concrete. It will avoid the need to bring much of the construction material such as cement, sand, metal etc. to the site (thus minimizing the vehicular movements within the site premises) and providing storage space on-site. This will also avoid the need to have cement mixed on-site, which will prevent further

disturbance of the exposed soil surfaces in peripheral areas, as it is now.

(vii) Oil and lubricant waste should not be buried or burnt in the project site but collected and stored in proper oil-cans and disposed for re-use or LA approved designated sites.

(viii) All other hazardous chemicals such as paint shall be stored in a safe place that is not subjected to floods or accidental spilling. Empty paint cans will be collected and removed to an authorized dumpsite.

(ix) Packing material, polyethene, wooden debris (e.g., used for shuttering work), etc. should be appropriately collected, stored and the contractor should remove them from the site before handing over.

(x) Water collection basins and sediment traps shall be installed in areas where construction machinery/equipment (concrete mixers, buckets, containers and cans, paintbrushes) must be washed daily.

C.4 Impacts due to activities creating noise and vibration

243. Noise and vibration are two key impacts that may result during construction work, which will be a nuisance to hospital staff, patients and neighbourhood.

244. **Noise.** Major sources of noise are the movement of construction vehicles, haulage of material, concrete mixing and other noise-generating activities (operation of cutters, drilling machines, riveting machines, compactors, concrete mixers, poker vibrators etc.) at the site which, cumulatively, can possibly produce a noise level exceeding 75 dB L_{Aeq} [22]. Equipment used in clearing and demolition the site, excavation, paving, and concreting is also known to generate moderate noise levels.

245. The elevated noise levels will be a localized and temporary impact that will last throughout the construction period. However, given that the worksite is close to the existing hospital facilities such as ETUs, OPDs, clinics, wards, and hospitals being sensitive receptors to impacts of noise and vibration, maximum mitigation will need to be taken to keep it under acceptable limits. This is particularly applicable to Medagama DHB, where a two-stored building will be renovated. The construction areas are located close to existing facilities in all the other hospitals.

246. According to the WHO Guidelines on limits for community noise[23], for most spaces in hospitals, the critical effects of noise are on sleep disturbance, annoyance, and communication interference, including interference with warning signals. The L_{Amax} of sound events during the night should not exceed 40 dB indoors. For wardrooms in hospitals, the guideline values indoors are 30 dB L_{Aeq}, together with 40 dB L_{Amax} during the night. During the day and evening, the guideline value indoors is 30 dB L_{Aeq}.

247. Since patients have less ability to cope with stress, the equivalent sound pressure level should not exceed 35 dB L_{Aeq} in most rooms in which patients are being treated or observed. Particular attention should be given to the sound pressure levels in intensive care units and operating theatres. The sound inside incubators may result in health problems, including sleep disturbance, and may lead to hearing impairment in neonates. Guideline values for sound pressure levels in incubators must await future research.

[22] 75 dB L_{Aeq} is the daytime (8.00 am to 6.00 pm) Maximum permissible noise level at boundaries of the land in which the source of noise is located for construction activities specified in the National Environmental (Noise Control) Regulations, No. 1 of 1996.

[23] Berglund, Birgitta, Lindvall, Thomas, Schwela, Dietrich H & World Health Organization. Occupational and Environmental Health Team. (1999). Guidelines for community noise. World Health Organization. https://apps.who.int/iris/handle/10665/66217

248. Vibration**.** The Interim Standard on Vibration Pollution Control for Sri Lanka provides guidelines for the operation of machinery, construction activities, vehicular movements, acceptable human exposure to vibrations depending on the length of the vibration period (continuous, intermittent, and impulsive).

249. It should be noted that structures are sensitive to vibration, and the ground induced vibrations and shocks can have severe damages to nearby properties when ground vibrations are exceeding certain limits.

250. Vibration standards for Type 2 structures – Single and two-storey houses and buildings made of reinforced blockwork, pre-cast units and with reinforced floor and roof construction, or wholly of reinforced concepts, not designed to resist seismic activities should have a maximum of 4.0 mm/sec (Peak Particle Velocity - PPV) at 0-10 Hz and type of vibration: intermittent. The building earmarked for renovation at Medagama DHB falls into this category, as well as some other buildings in the periphery.

251. Vibration standards for Type 3 structures – single and two-storey residential houses and buildings made of lighter construction material such as bricks and cement blocks, not designed to resist seismic activities should have a maximum of 2.0 mm/sec (Peak Particle Velocity - PPV) at Frequency of vibration at 0-10 Hz and type of vibration: intermittent. Most of the hospitals have such structures in the close periphery.

252. Vibration standards for Type 4 structures – structures that, because of their sensitivity to vibration & declared as archaeologically preserved structures by the Department of Archaeology should have a maximum value of 0.5 mm/sec (PPV) at 0-10 Hz and type of vibration: intermittent. Most of the buildings in the Haputale DHB falls to this category. Some buildings at Metigahatenna, though not archaeologically preserved buildings, are close to 90–100 years old.

253. Demolition of structures, especially concrete chipping, and excavation, could create moderately high vibration in the area as well. Pneumatic drills and excavators can induce ground vibrations, which may lead to human disturbance and structural damage.

254. However, activities that generate high vibration levels are not expected. Even such activities are adopted, they will be limited to short durations.

Measures to mitigate the impacts

(i) Although the daytime (8.00 am to 6.00 pm) maximum permissible noise level at boundaries of the land in which the source of noise is located for construction activities specified in the National Environmental (Noise Control) Regulations, No. 1 of 1996[24] is 75 dB L_{Aeq}, it is clear that the criteria should be based on the WHO Guidelines on limits for community noise for noise levels within indoor spaces, to the extent that is practicable. This issue has to be discussed with individual hospital authorities, depending on the location of hospital facilities relative to the construction site.

(ii) High noise-generating activities should be scheduled after informing and with the consent of the hospital authorities so that issues related to high noise can be overcome.

(iii) Noise barriers must be erected, if needed, to cut down high noise. However, the contractor can separate the site premises with a delineated barrier with the dual function of dust/noise containment and safety.

(iv) Use of noisy machines should be restricted and where possible noise-reducing means for construction machines should be used. Avoid using multiple high noise generating

[24] See Annex 8b for regulatory limits

equipment/activities simultaneously

(v) Noisy construction machines/activities should be scheduled to coincide with non-clinic and non-OPD days/times as much as possible or on days that patient visitation to the facility is minimum. All other construction activity should be between 8.00 am to 6.00 pm daily to avoid discomfort caused by noise and vibration that for in-patients and neighbourhood.

(vi) If certain nighttime construction activities are unavoidable, it should be done using noise-reducing means or low-noise technologies.

(vii) Use of ready mix concrete will avoid the need to have manual mixers operated at the site, ready mix concrete mixer trucks and pumps can generate similar kind of noise; however, the duration will be very much shorter than manual mixing of concrete.

(viii) Equipment used in construction work should meet industry standards for noise and vibration in Sri Lanka.

(ix) Liaising with the hospital authorities of the work schedules is always advisable. Prior notices of noise generating activities will avoid confusions of among hospital authorities and the contractor.

(x) Conformity to the Interim Standard on Vibration Pollution Control for Sri Lanka[25] provides guidelines to mitigate the vibration-related impacts due to the operation of machinery, construction activities, vehicular movements, and also provides acceptable human exposure levels to vibrations depending on the length of the vibration period.

(xi) If vibration causes structural damages to nearby structures, the contractor is liable to rectify such damages. A prior crack survey has to be carried out as a precautionary measure so that both the contractor and the hospital authorities can resolve issues (if any) that may arise in an unlikely case.

C.5 Impacts due to activities creating emissions and impacts on air quality

255. Air quality within the sites will suffer temporarily due to fugitive dust generation from excavation, construction, stockpiling and transporting activities. The impact will be localized and minor because most of the proposed sites are located at the backyards of other buildings of the hospitals, and the premises are not often visited by hospital staff and/or patients. Small amounts of dust can fall on areas which are located on the windward direction of the sites (about 50–75 m away).

256. Other than the immediate surroundings of the hospital premises, the impact on the neighbourhood can be considered minimal because there are no houses located close to any of the sites other than the hospital staff quarters. Many of the sites have large trees with widespread canopies, which will act as barriers for dust blown away from the site. Increase in gaseous emissions such as CO2, NOx, and SO2 from construction machinery and vehicles will be minor to make a severe impact on the air quality.

Measures to mitigate the impacts

(i) Effective dust barriers have to be erected to prevent dust being blown towards other parts of the hospital (as mentioned above this barrier can function as noise/dust containment as well as for fencing the site premises that is used for safety reasons). The height of the barrier, material (e.g., zinc-aluminium sheets, plywood sheets, tarpaulin, etc.) to be used

[25] See Annex 8c for Limits for vibration control

for the barrier and the locations have to be decided in consultation with the hospital authorities under the instructions of the DSC. The dust barriers can be part of the temporary partition of the site premises. Any windows, openings, and louvres of adjacent buildings of the hospital which are most susceptible to fugitive dust fall have to be temporarily covered with polythene sheets until the construction work is over. Such areas include ward areas, ETU, OPD areas, consultation rooms, clinic areas.

(ii) The site should be cleaned daily, especially surfaces that are affected by soil and dust.

(iii) The land clearing and other preparatory activities should be completed within a shortest possible time period. Any soil heaps (after excavations/cutting/clearing of land) have to be kept covered. The construction debris should be disposed of without keeping them on-site.

(iv) Regular watering (at least twice a day during the mid-morning and mid-evening) should be carried out in the construction site for dust suppression.

(v) Excavated soil that is temporarily stored on-site should be covered in a tarpaulin or other locally sourced suitable material to prevent from dust particles getting airborne.

(vi) Where possible, construction stockpiles and debris piles should be stored away from the functional areas of the hospital.

(vii) During transportation trucks carrying earth, spoil (if any) or construction material to and from the sites should be covered by a tarpaulin. Speed controls must be imposed on construction vehicles from about 500 m away from the site.

(viii) Any equipment and machinery which uses diesel shall be appropriately maintained, to control emissions. The contractor has to ensure that the vehicles entering the site have obtained Vehicle Emission Certificates (VEC).

257. Note: Vehicle Emission Test (VET) became mandatory from 15th July 2008 in order to enforce the environmental standards on vehicle emission provided in the Motor Traffic Act (Emission Control) Regulation of 1994, 817/6, Part I, Section I. This regulation applies to all construction vehicles as well.

C.6 Impacts due to activities that affect surface and groundwater quality and quantity

258. Construction work is commonly known to cause blockages in drains (both natural and human-made) leading to localized flooding and water stagnation. Impedance to drainage is often a result of poor site management and mishandling of construction material/debris. It is essential to identify the drain paths within the hospital that discharges storm-water outside and to ensure that these as well as the lead away drains are kept clear of debris for water to flow freely. Stagnant water also carries the risk of mosquito breeding.

259. Construction wastewater from concrete work and equipment washing can potentially pollute water sources, both ground and surface. Any contamination that occurs either directly through over-land surface runoff during rainfall or indirectly through contaminated soil can lead to the washing away of construction waste. Construction wastewater that ends up in the roadside drainage adjacent to the hospital can eventually lead to wetlands, paddy fields or surface streams in both hilly and flat terrain. Given the scale of construction planned, this is not considered a significant impact, nevertheless requires mitigation.

260. **Wastewater.** Disposal of grey water and black water from the site and workers camps or temporary toilets within the project site could cause contamination of nearby watercourses, groundwater sources and soil. Similarly, the disposal of MSW produced by workers could lead to leachate being generated contaminating the surface runoff.

261. However, the number of workers will not be many in most of the sites (may be 10–15, maximum). Therefore, impacts due to generation of wastewater are not significant. However, wastewater should be appropriately managed on-site.

Measures to mitigate the impacts

(i) Maintain cross drainage within the site always during construction. Hence stockpiles and debris must be safely stored away from these drainage paths.

(ii) Where blockage of drainage is unavoidable, alternative paths must be created to facilitate stormwater flows from the site to outside.

(iii) Lead away drains that collect water from the internal drainage system of the nearby buildings (if any) must be kept clean and free from any constrictions to ensure a smooth flow of stormwater.

(iv) The construction site/s should be checked daily (after wet weather) for any signs of water stagnation and cleaned.

(v) Collection and disposal of construction-related wastewater (i.e. mud water, water contaminated with cement, concrete other solvents, etc.) will be the responsibility of the contractor who shall conform to the standard practices in handling such construction-related wastewater. Such clauses shall be included in the contract agreement under Environmental Compliance.

(vi) A washing area for construction equipment should be delineated within hospital premises away from the construction area

(vii) Wastewater from the construction site should not be directly discharged into roadside drains. It should be first directed to a pit to allow siltation and percolation before connecting to a lead away drain.

(viii) Grey and black water should be collected and disposed of appropriately. Temporary toilets should not be located close to shallow wells. Grey and black water should never be disposed to nearby drains, canals, including roadside drains. Such wastewater should be disposed of on-site by way of having an appropriate collection and disposal system (e.g., pit latrines, or septic tanks with soakage gullies/pits, etc.).

(ix) The workers may use existing toilets in the hospital premises, with the consent of the hospital authorities. Such use of toilets should not affect other users of the hospital in any way. Also, it has to make sure that such use of toilets will not affect the health of the workers, as the toilets may be used by patients, thereby exposing workers to undue health risks.

C.7 Impacts due to extraction of water for construction purposes

262. Supply of good quality water to be used in adequate quantities for construction purposes was observed to be a problem in many of the sites visited. Excepting in a few HCFs where a regular connection of treated water is provided by the National Water Supply and Drainage Board (NWSDB), other HCFs obtain water from a variety of sources such as treated/untreated rural schemes, springs, shallow ground wells and tube wells (see Table 5.10). Most places complained of the unreliability of piped connections and poor water quality of ground sources.

Measures to mitigate the impacts

263. Availability of water for construction purposes will have to be assessed in a site-specific manner. However, where water stresses exist, the contractor should arrange his own supply for construction activities to avoid potential conflicts. If the contractor is compelled to share limited water supplies within the hospital or in the local area, necessary approvals shall be obtained from the hospital authority or the local authority, as required.

264. Water usage by the contractor has to be priced, and the cost of the supply has to be claimed. DSC and the PIU have to check this prior to payment of any claims of the contractor.

C.8 Impacts due to solid waste generation, collection, and disposal

265. **Municipal Solid Waste.** Improper disposal of municipal solid waste will create nuisance among the users of the existing hospital premises as well as neighbouring communities. Impacts of poor municipal solid waste management include the breeding of disease vectors and vermin, leachate, public nuisance, and pollution – water, soil, and air.

266. **Construction waste and debris.** Solid wastes generated from the construction activities are vegetation cleared from the site, excess excavated earth (spoils), discarded construction materials, cement bags, wood, steel, oils, fuels, and other similar items. Improper waste management could cause odour and vermin problems, pollution and flow obstruction of nearby watercourses and could negatively impact the landscape. Due to small scale construction activities that are planned under the sub-projects, the volumes of construction debris volumes are not significant.

267. There will be no significant physical changes at the construction sites, and this small quantities of waste could be disposed of (with the guidance of the local authority) without causing further physical impacts (on air quality, topography, soil quality, etc.) at the point of disposal. No particular action will, therefore, be needed to reduce physical impacts at both the construction and disposal sites. However, the contractor should take efforts to reduce the amount of waste that is discarded by following the mitigation measure proposed below:

Measures to mitigate the impacts

268. **Municipal Solid Waste.** Municipal solid wastes may be generated from the workers' camps. During the construction period, such solid waste shall be handed over to the local authority. However, the contractor shall be responsible for deploying the best domestic solid waste management practices at the site that should consist of:

- Solid waste should never be burnt in the open (on-site or elsewhere)
- Waste separation within the site premises in CEA/local authority approved colour-coded bins. The bins should be tightly closed to prevent vermin and pest infestation
- Hand over the collected waste to the local authority. Provision of easy access for the waste collection truck/tractor of the local authority
- The Technical Officer of the contractor should make the workers aware of waste management practices and oversee compliance to such practices, and maintaining a good communication system with the local authority
- Maintaining the waste storage spaces clean, and
- Once the biodegradable waste and mixed waste is handed over to the local authority, sell the recyclable waste (if any) to selected collectors registered with the CEA in the area

269. **Construction waste and debris.** Under the Environmental Compliance of the contract agreement, the following clauses shall be included to minimize the amount of construction waste generation.

- Use 'ready-to-use' building materials to the extent as possible to make sure less processing at the project site (i.e. ready mixed concrete, doors, windows, timber fittings, railings etc.)
- Reduce the use of hazardous paints as much as possible at the site (such as the use of powder-coated doors, and window frames purchased from the open market). Solvents and paints which are considered to be hazardous should also be separately stored for re-use
    - Adoption of 5 S management tools in the construction site to make sure the separation of construction waste into clear categories (i.e. for re-use, re-sell, disposal). Reuse as much waste soil in this project as possible and find alternative beneficial uses for any unused material (e.g., excess soil and damaged bricks/blocks can be used as infill in other construction works)
- Adaption of the best construction sites management practices to reduce the generation of 'mixed waste.'
- The contractor should have an approved site (by the relevant authorities) for the construction waste disposal
- The disposal of all the construction waste is the responsibility of the contractor. The contractor should deploy the best environmental compliance methodologies following the CEA regulations/guidelines
- Once the construction is over, the contractor is responsible for cleaning up of any waste material remaining in the site premises. Conduct site clearance and restoration to original condition after the completion of construction work in and around the site; DSC to ensure that site is appropriately restored before issuing of construction completion certificate. If not, any remaining waste will be cleaned up, and the cost may be deducted from retention payments.

270. <u>General comments on waste management</u>

271. In general, the contractor is responsible for: (i) providing waste collection bins and other containers of all sorts, (ii) handling, emptying and removal of those bins and containers, (iii) removal of waste of all sorts form the site, (iii) pest and Vermin control

272. The contractor has to prepare and submit a *waste management plan* to the DSC for approval. This Plan should specifically address the proposed arrangements for:

- avoidance, reuse, recovery/recycling
- collection
- storage, treatment, and disposal of each category of waste anticipated to arise from their works

273. In addition, the proposed designation of areas for segregation and temporary storage of re-usable and recyclable material should be explicitly mentioned.

C.9 Impacts due to migrant labourers and operation of labour camps

274. A large labour force is not expected to be required for project purposes and as such large labour camps having significant impacts are not anticipated. Also, the majority of the labours may come from the local area itself, and therefore, there will be no need to provide them with accommodation facilities. However, the necessary mitigation measures will be taken in managing labour.

Measures to mitigate the impacts

(i) If there is a need to establish labour camps, they should be established in suitable locations away from the hospital's functional areas with the consent from the hospital management. The labourers should be instructed to behave in the camps decently without creating disturbances to hospital users and others in the neighbourhood. There can be conflicts between labourers from outside areas and the local community members. This issue also should be carefully handled by the contractors. The hiring of local people would be the most effective solution to avoid possible conflicts between migrant labours and the local community members. This will also provide t livelihood opportunities to the local community.

(ii) Labourers/workers should be provided with adequate sanitation facilities and receptacles for garbage collection. Domestic solid waste collected should be disposed of daily at a site approved by the local council or given to them where garbage collection services exist. Burying and burning domestic waste in the project sites should also be strictly avoided. A good supply of drinking water should be provided to the labour camps.

C.10 Impacts due to occupational health and safety

275. Occupational health and safety are one of the critical risks of the project to be addressed. The scale of construction is small, and the risks are not significant. There will be no large machinery or equipment needed for construction purposes. Scaffolding will be limited as the building is only a single-storied building. Only two sites have two-storied buildings proposed for civil works: renovation of the building at Medagama DHB and the building at Metigahatenna DHB.

Measures to mitigate the impacts

(i) Three essential features of a safe construction site include (i) fully functional and well-maintained equipment, (ii) availability of emergency equipment and safety warnings, and, (iii) worker personal protective equipment (PPE) and a strong commitment to follow safety practices with proper supervision of labour with proper monitoring and feedback to support continuous improvement. Therefore, appropriate safety equipment, tools and protective clothing should be provided to workers, and the contractor must ensure that safe working method are applied.

(ii) Workers must be provided with first-aid and health facilities. First aid training should be provided to the supervisor. The contractor should organize awareness programs about the personal safety of the workers and the general public in the area with proper briefing and training on safety precautions, their responsibilities for the safety of themselves and others.

(iii) The constructors should carry out suitable training programs on occupational health and safety for workers

(iv) Machinery and equipment that could easily electrocute should be kept safely within the site and always under the supervision of an experienced worker. Arranging regular safety checks for vehicles and equipment is needed, including the labour huts.

(v) Allocation of responsibility to the relevant personnel is needed. Prohibition of alcohol and other narcotic substances which may impair the judgment of workers engaged in construction activities, should be enforced.

(vi) Excavated areas for construction should be barricaded using barricading tapes and signboards. When work is done at higher elevations; the work should be carried out and supervised by experienced workers.

276. **Emerging concerns on the safety of workers to prevent spreading of COVID-19.** The contractor has to consult the HCF where the civil works are proposed and have to formulate a Safety Plan to prevent spreading of COVID-19 before mobilization of workers for civil works.

277. This safety plan should consist of the information as proposed in Annex 9.

C.11 Impacts on public health and safety

278. Public safety issues concerning the hospital staff and the patients who visit the hospital daily should be considered a priority. In all the HFCs, clinics are held several days a week/month for a range of issues including medical, NCD, asthma, well-woman, ante-natal, paediatric and psychiatric when many patients in addition to the out-patients (OPD) use the hospital grounds. In some of the hospitals where civil works are proposed, these out-reach, OPD and emergency services will be relocated to different parts of the hospital to continue to serve the local community. In contrast, the construction and rehabilitation work goes on. Hence, ensuring the safety of hospital staff and patients from risks of falling, injury and all other forms of accidents is of very important.

279. This impact is minor in some hospitals because the proposed sites are located separately from of the other areas of the hospital/clinics, and the premises are not often visited by hospital staff and/or patients (e.g., Kotagama, Nannapurawa and Metigahatenna). However, the impacts on the public will be severe in Medagama DHB where the patient visits are relatively very high, and there is not much space available in the periphery of the building and minimal space for construction-related work organization. The site works at Rathmalgaha Ella, Pitakumbura, Lunugala, Carklees, Uva Paranagama, Haputale will obstruct access to the hospital and other facilities within the hospital, and also waiting areas of patients and parking spaces for vehicles. Access roads to quarters should not be obstructed in Haputale and Lunugala sites. Also, Haputale and Lunugala site works will obstruct access to wards and emergency access to hospital facilities. Alterations to the entrance space to the ETU at Uva Paranagama has to be carried out with care so as not to pose any dangers to the hospital users.

280. Cutting operations of the embankment at Carklees will pose dangers to the public as the only access to the hospital will be obstructed. Also, any loose boulders may be removed safely, and the slopes should be made stable. Slope stabilization and strengthening to ensure public safety applies to other sites as well (Lunugala, Metigahatenna, Uva Paranagama and Haputale).

<u>Measures to mitigate the impacts</u>

(i) The construction site should be delineated from the rest of the hospital, preferably using barricading tape or any other suitable material that separates the construction area from the rest of the hospital physically. Appropriate signages should be adopted to alert the public od any dangers posed by construction-related activities. Signs must be kept clean and well maintained if they are to be effective.

(ii) A safe pedestrian pathway to the hospital buildings should be provided if regular access along with the nearby gate and the hospital access road is blocked.

(iii) Signboards and directions for such detouring and shifting of facilities should be placed in all the two local languages, at prominent locations and in large-sized lettering. The contractor should always keep in mind that the patients are very vulnerable and susceptible to risks, even when they are minor due to their physical and mental weaknesses. Therefore, slightest disturbances which are considered tolerable to healthy persons should not be ignored. Proving safety precautions, therefore, is essential. This is again significant because the majority of the patients those visit the HCF are elderly

persons. Safety of the peripheral areas of the site and access paths should be ensured at all times, e.g., non-slippery surfaces, clear of any obstructions and dangers, maintaining a clean, tidy, and well-managed sites and activities, etc.

(iv) Safety signs should be placed at appropriate locations, informing the public of any dangers posed by construction-related activities.

(v) Emergency access should never be obstructed. Alternative access for the ambulance and vehicular access should be provided whenever needed.

(vi) Strict entry controls to the site premises should be in place so that unauthorized entry is debarred.

(vii) Notices should be provided to hospital staff and users about the schedule of construction activities with particular hazards, and potential noise and dust episodes, etc. Advance public notices should be displayed so that the hospital users are informed of construction schedules.

(viii) Concrete mixer trucks or any other trucks/construction vehicles should not be parked outside the hospital premises, as the access roads are either narrow or busy.

(ix) Delineation devices such as cones, lights, tubular markers, barricades tapes, warning signposts, etc. should be erected to inform hospital users about work zones. Dangerous warning signs should be raised to inform public of dangers and to keep them away from such hazards.

(x) Tree cutting should be done with care so as not to damage the existing structures and not to obstruct access roads. Advance public notices should be displayed so that the hospital users are informed of the tree cutting. Hospital authorities should be informed of the scheduled activities.

(xi) All slopes should be strengthened by appropriate engineering interventions. Access roads and access paths should be rehabilitated to their original conditions.

C.12 Site restoration (at the end of construction) and landscaping

281. Several additional works are necessarily needed at each hospital premises, and they have to be considered as essential parts of the sub-project activities or interventions.

(i) Providing proper rainwater drainage network to the areas peripheral the site, which will also prevent local flooding of low-elevation areas of the hospital premises, avoid soil erosion in the sloping terrain. Any lead away drains, roof gutters and downpipes of other buildings, if damaged or altered during construction, should be restored.

(ii) Rehabilitation of the areas used for labour huts, offices, water storage tanks, material storage yards, temporary drains, toilets, etc.

(iii) Turfing any exposed ground area, especially sloping terrain to avoid soil erosion and landscaping with selected trees (see Chapter 4). This will prevent soil erosion of the peripheral areas of the sub-project.

C.13 Impacts on biological resources

282. The proposed sites are not located within environmentally sensitive areas (See Figures 4.34a and 4.34b).

283. The only noticeable impact to biological resources will be felling of a few trees to make way for the proposed infrastructure, which has been covered under pre-constructional impacts. All the sites are confined to existing hospital premises. Therefore, vegetation cover present in the proposed sites are secondary vegetation or bare land, and most of the flora observed during the survey are common to the project area. Most of the trees are fruit-bearing trees that are commonly found throughout the country. Therefore, the impact on flora is negligible. The proposed sites are not connected with any sensitive habitats, which are of ecological significance. No aquatic plants and vegetation will be cut, removed, or pruned/trimmed during the construction.

284. The details of trees that need removal are provided in Chapter 4.

285. During the construction stage, soil erosion, water and air pollution, noise and vibration could be expected at the low levels; therefore, negative impact on both flora and fauna in aquatic and terrestrial is not anticipated. Fragmentation or modification of habitats is not expected due to the proposed development, due to their small scale.

Measures to mitigate the impacts

286. It is recommended to plant at least three trees for each tree that is cut. The preferred number would be five trees for each tree that is cut. The PIU can (in consultation with Agrarian Development Office) provide fruit-bearing trees to be planted within the hospital premises. Trees such as jackfruit, breadfruit, mango, jambu, guava, avocado are some of the species that are common in these hospitals. Trees such as teak, mahogany, mee, ehala are also popular.

C.14. Impacts on the Cultural and historical environment

287. There are buildings (and canals and culverts lined with boulders) which are close to 150 years old at Haputale DHB which should be considered as archaeologically important sites which are located close to the project areas. Also, there are buildings which are close to 100 years old at Metigahatenna DHB. The contractor has to contact the Department of Archaeology and get their views (and guidelines, consents, or approvals, if needed) prior to mobilization of work.

Measures to mitigate the impacts

288. All the staff and labourers of the contractor should be informed about the possible items of historical or archaeological value, which include old stone foundations, tools, clayware, etc. If something of this nature is uncovered, Department of Archaeology shall be contacted, and work shall be stopped immediately. The chance find the procedure of archaeological and cultural artefacts are described in Chapter VI.

289. If instructed by the Department of Archaeology (DOA), the contractor should undertake reconnaissance surveys with the DOA to identify any archaeological/historical weak structures (if any) that are likely to damage from high ground vibration levels during excavation work.

D. Impacts during the operational stage of newly constructed facilities

D.1 Impacts of improper handling and disposal of healthcare waste

290. Healthcare waste (HCW) includes a significant component of general waste and a smaller proportion of hazardous and infectious waste. Infectious and anatomic wastes together represent the majority of the hazardous waste, up to 15% of the total waste from healthcare activities. Sharps represent about 1% of the total waste, but they are a significant source of disease transmission if not adequately managed. Chemicals and pharmaceuticals account for about 3% of waste from healthcare activities. In contrast, genotoxic waste, radioactive matter, and heavy

metal content account for around 1% of the total healthcare waste, depending on the types of services provided by the facility.

291. Types of waste generated in the HCF are classified as follows:

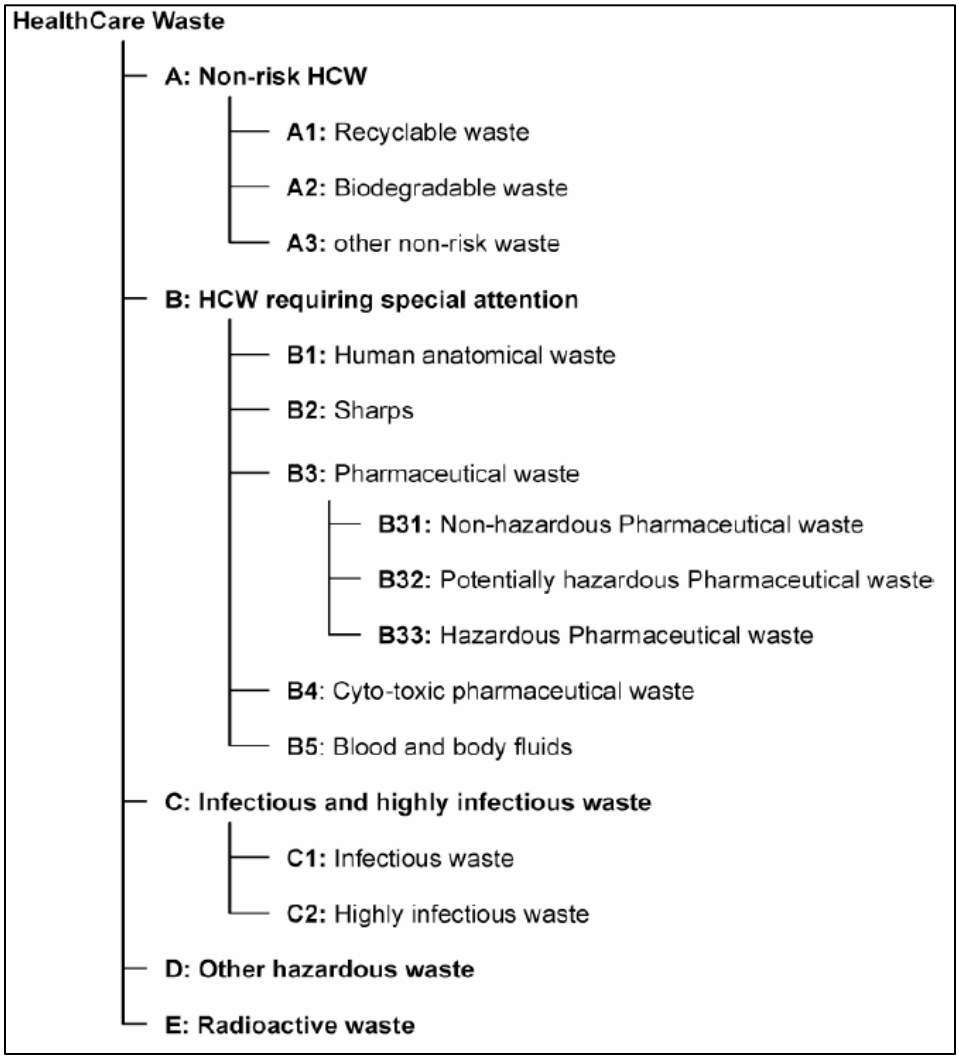


Figure 5.1: WHO Classification of HCW

Note: This categorization follows Technical Guidelines on Environmentally Sound Management of Biomedical and Health-care waste provided by the Conference of the Parties to the Basel Convention on the Control of Trans-boundary Movements of Hazardous Waste and their Disposal (December 2002)

292. As mentioned above, many types of additional medical and hazardous waste are generated, including infected masks, gloves, and other protective equipment, together with a higher volume of non-infected items of the same nature.

293. The significant component of non-hazardous healthcare waste is similar to municipal waste and should not pose any higher risk than waste produced in households. It is the smaller hazardous healthcare waste component that needs to be appropriately managed so that the health risks from exposure to known hazards can be minimized.

294. Excreted pharmaceuticals from patients do find their way into waterways, which can contribute to potentially serious environmental effects, including toxicity to wildlife and the generation of antibiotic resistance in bacteria.

295. Medical and sanitary staff can be at risk of respiratory or dermal diseases caused by exposure to chemicals and pharmaceuticals. All individuals exposed to hazardous healthcare waste are potentially at risk, including those within healthcare establishments that generate hazardous waste, and those outside these sources who either handle such waste or are exposed to it as a consequence of careless management. The main groups at risk are the following:

- Medical doctors, nurses, healthcare auxiliaries, and hospital maintenance personnel
- Patients in healthcare establishments or receiving home care
- Visitors to healthcare establishments
- Workers in support services allied to healthcare establishments, such as laundries, waste handling, and transportation
- Workers in waste disposal facilities (such as dumping sites or incinerators), including scavengers.

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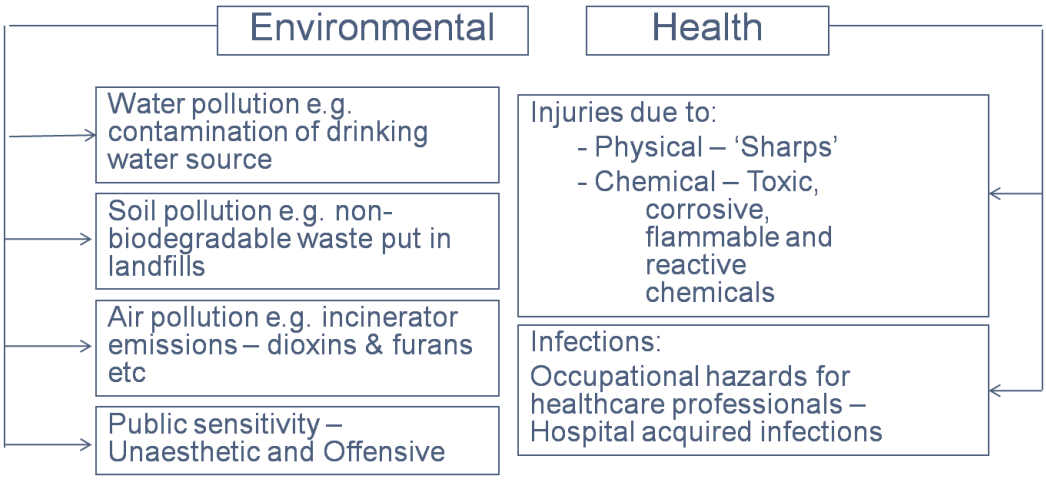

Figure 5.2: Impacts of improper handling of waste disposal

Measures to mitigate the impacts

296. The design and functional layout of the HCF should ensure the following: separation of clean/ sterilized and dirty/contaminated materials and people flows; development and inclusion of adequate disinfection/sterilization procedures and facilities; adequate space for the storage of (uncontaminated) recyclable materials (e.g. cardboard and plastic) for pickup; selection of heating, ventilation, and air conditioning (HVAC) systems that provide isolation and protection from airborne infections; design of water systems to provide adequate supplies of potable water to reduce risks of exposure to Legionella and other waterborne pathogens; provision of hazardous material and waste storage and handling areas; treatment and exhaust systems for hazardous and infectious agents; and selection of easily cleaned building materials that do not support microbiological growth, are slip-resistant, nontoxic, and non-allergenic, and do not include volatile material. The HCW that is generated within an HCF should always follow an appropriate and well-identified stream from their point of generation until their final disposal. This stream is composed of several steps that include generation, segregation collection and on-site transportation, on-site storage, offsite transportation (optional), treatment and disposal of the HCW (See Figure 5.3).

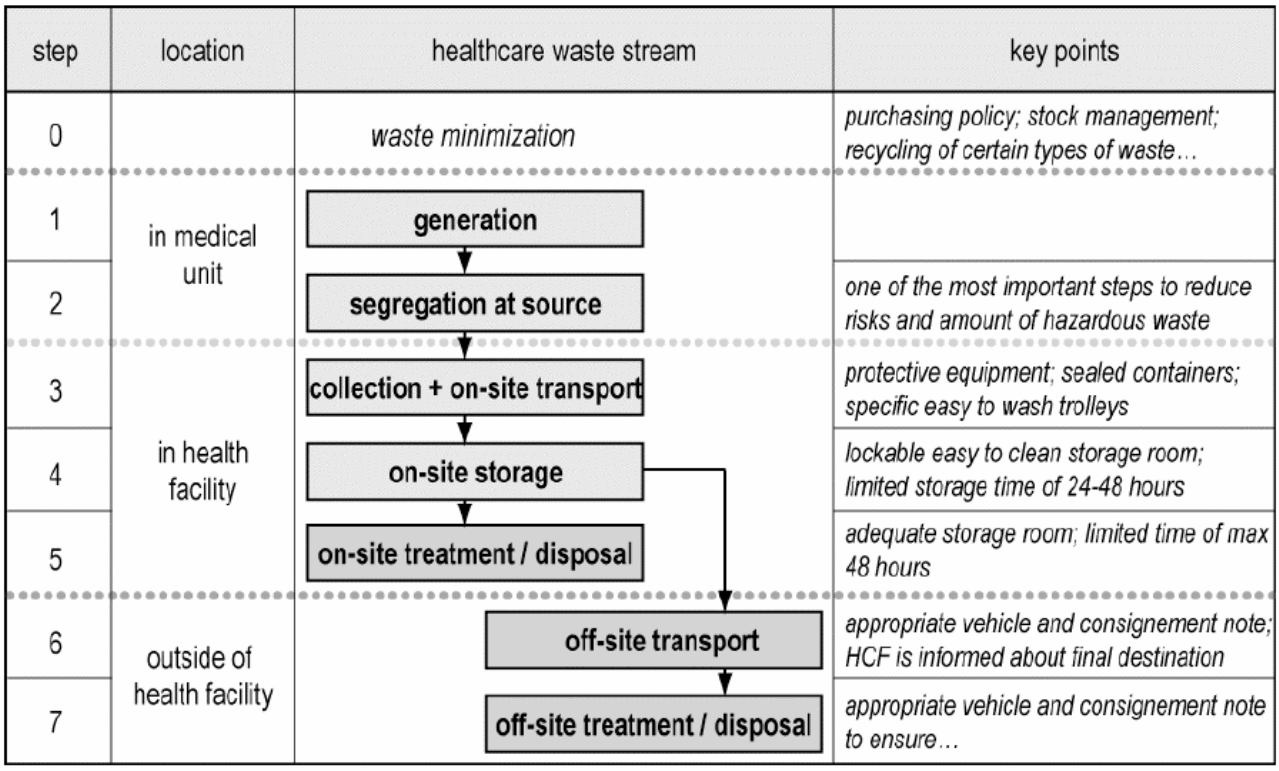

Figure 5.3: Synopsis of the HCW stream

Source: Preparation of national healthcare waste management plans in Sub-Saharan countries guidance manual (2005). Secretariat of the Basel Convention and the World Health Organization.

297. **Segregation of HCW.** It is required to have a waste segregation facility in the HFC to have a better Health Care Waste Management system. Healthcare waste is generated in the HFC should be segregated according to WHO recommended segregation and colour code (Figure 5.4).

298. Highly infectious waste, such as diagnostic laboratory samples and waste from infectious patients in isolation, should be collected separately and autoclaved at the point of generation. Once disinfected, the waste would leave a medical area in the infectious healthcare waste container. Containers for infectious waste should not be placed in public areas because patients and visitors may use the containers and come into contact with potentially infectious waste items.

299. Waste bins should be located as close as possible to sinks and washing facilities because this is where most staff will deposit gloves and aprons after treating patients. If the general waste container is closest to the sink or under a towel dispenser, it will encourage staff to place towels into the non-infectious receptacle. Containers should be of similar size to overcome the observed tendency for staff to put waste in the largest receptacle.

Table 5.4: WHO recommended segregation scheme

Black	Yellow	Brown
✓ non-risk waste of category **A** ✓ exceptionally, small quantity of waste of category **B1** ✓ pharmaceutical waste of category **B3**, class **B31** only	✓ special waste of categories **B1**, **B2**, **B4**, **B5** ✓ infectious waste and highly infectious waste of categories **C1** and **C2** ✓ radioactive waste of category **E**	✓ pharmaceutical waste of categories **B3**, classes **B32** and **B33** ✓ category **D** such as chemicals, heavy metal wastes

Source: Preparation of national healthcare waste management plans in Sub-Saharan countries guidance manual (2005). Secretariat of the Basel Convention and the World Health Organization.

Table 5.6: WHO recommended segregation and collection scheme

Waste categories	Colour of container and markings	Type of container	Collection frequency
Infectious waste	Yellow with biohazard symbol (highly infectious waste should be additionally marked **HIGHLY INFECTIOUS**.	Leak-proof strong plastic bag placed in a container (bags for highly infectious waste should be capable of being autoclaved).	When three-quarters filled or at least once a day.
Sharp waste	Yellow, marked **SHARPS** with biohazard symbol.	Puncture-proof container.	When filled to the line or three-quarters filled.
Pathological waste	Yellow with biohazard symbol.	Leak-proof strong plastic bag placed in a container.	When three-quarters filled or at least once a day.
Chemical and pharmaceutical waste	Brown, labelled with appropriate hazard symbol.	Plastic bag or rigid container.	On demand.
Radioactive waste	Labelled with radiation symbol.	Lead box.	On demand.
General health-care waste	Black.	Plastic bag inside a container or container which is disinfected after use.	When three-quarters filled or at least once a day.

Source: Safe management of wastes from healthcare activities: a summary. Geneva: World Health Organization; 2017 (WHO/FWC/WSH/17.05). Licence: CC BY-NC-SA 3.0 IGO.

300. Any contaminated wash water should be autoclaved and disinfected before discharge to the septic tank. Such water must be disposed of into drains connected to a septic system or in a soak away pit. If greywater is disposed of in a soakaway pit, the pit should be fenced off within the HCF grounds to prevent tampering and to avoid possible exposure in case of overflow.

301. **Labelling of segregated HCW.** A three-bin system should be established with appropriate labelling in all the HCFs: 1) general HCW (black bags/bins; no symbol); 2) potentially infectious HCW (yellow bags/bins; biohazard symbol); 3) used sharps, including broken glass (yellow containers; biohazard symbol);

Table 5.7: labelling of HCW containers

Category	Labelling	International symbols
B1	« Danger ! Anatomical waste, to be incinerated or deeply buried »	
B2	« Danger ! Contaminated sharps, do not open »	
B4, B5, C1	« Danger ! Hazardous infectious waste »	
C2	« Danger ! Highly infectious waste, to be pre-treated »	
B32, B33, D	« Danger ! To be discarded by authorized staff only »	
E	« Danger ! Radioactive waste »	

Source: Preparation of national health-care waste management plans in Sub-Saharan countries guidance manual (2005). Secretariat of the Basel Convention and the World Health Organization.

302. All the hospital that were visited practice segregation of waste, however, the colour code followed in the National colour code for segregation of solid waste, and they use only yellow bags for infectious waste. No labelling is being used in any of the hospitals.

303. **Storage.** The storage area should have an impermeable, hard-standing floor with good drainage (away from watercourses). The floor should be easy to clean and disinfect. It is required to include the facility to keep general waste separated from infectious, and other hazardous wastes, a water supply for cleaning purposes, easy access for staff in charge of handling the waste, lockable premises to prevent access by unauthorized persons, easy access corridors for waste-collection vehicles; should be inaccessible to animals, insects and birds; have good lighting and at least passive ventilation; not be situated in the proximity of fresh food stores and food preparation areas; have a supply of cleaning equipment, protective clothing and waste bags or containers located conveniently close to the storage area; and have a washing basin with running tap water.

304. These storage areas should be sized according to the quantities of waste generated and the frequency of collection. The areas must be enclosed and separate from supply rooms or food preparation areas. Floors and walls should be sealed or tiled to allow easy disinfection. If present, the storage room should be connected to a particular sewage system for infectious hospital wastewater.

305. Where possible, hazardous waste generated in medical areas should be stored in utility rooms, which are designated for cleaning equipment, dirty linen, and waste. From here, the waste can be kept away from patients before removal

306. **Transporting.** While transporting waste within the hospital premises, it is required to use separate floors, stairways, or elevators as far as possible. Waste, especially hazardous waste, should never be transported by hand due to the risk of accident or injury from infectious material or incorrectly disposed sharps that may protrude from a container. Spare trolleys should be available in case of breakdowns and maintenance. The vehicles should be cleaned and disinfected daily. All waste bag seals should be in place and intact at the end of transportation.

307. Wastewater from washing hands, cleaning, laundry, bathing, flush toilets and teeth brushing activities should be safely collected and treated with chlorine before being infiltrated into a soak-away pit (providing the water table is at least 1.5 m under the bottom of the pit at any time). The potential of contamination to the sanitation crew, the general community, healthcare workers, and the environment is, of course, of critical concern.

308. To minimize any kind of occupational risk, less hazardous chemicals should be substituted whenever possible and protective equipment provided to all personnel likely to be exposed. Buildings in which hazardous chemicals are used should be adequately ventilated, and personnel handling hazardous materials should be trained in preventive measures and emergency care in case of an accident.

309. Hospital and the lab should derive a benefit from introducing and implementing environmental management systems. These benefits include cost reductions through reduced energy consumption, reduced quantities of waste, increased recycling and minimized negative impacts on the environment from waste handling and treatment, and an improved public image.

310. **Treatment.** Hazardous/ infectious HCW can be treated on-site (i.e. in the HCF itself) or off-site (i.e. in another HCF or a dedicated treatment plant).

311. On-site treatment: This option is often the only one possible in the rural HCFs of the primary health care units, but on-site treatment can also be carried out for HCW generated in Divisional Hospitals. On-site treatment facilities are particularly appropriate in areas where hospitals are situated far from each other, and the road system is poor. The advantages of providing each health-care establishment with an on-site treatment facility include convenience and minimization of risks to public health and the environment by confinement of hazardous/infectious HCW to the health-care premises. However, the treatment costs may be high if there are many hospitals: extra technical staff may be required to operate and maintain the facilities, and it may be difficult for the relevant authorities to monitor the performance of many small facilities. This may result in poor compliance with operating standards, depending on the type of facilities, and increased environmental pollution.

312. Currently, none of the hospitals included in the Uva Province for Round 2 civil works has on-site treatment facilities. All the hospitals burn the waste in dedicated pits (Uva Paranagama) or open-air or bury them (Haputale DHB). Some of the hospitals collect the sharps to be handed over to the MOH, and others sterilize/autoclave the sharps before burying. Some of the hospitals have autoclaves which are either non-functional or never have been used (e.g. Kotagama PMCU).

313. Off-site treatment. The HCW generated in an HCF can be treated off-site when centralized regional facilities exist. Although off-site treatment increases the dependency of the HCF on an external actor and requires a finetuned transportation system, it provides many advantages:

- Small HCFs (PMCUs and DHs) will not have to devote time and personnel to manage their own installations
- Efficient operation can be more easily ensured in one centralized facility than in several plants where skilled workers may not be readily available
- Greater cost-effectiveness for larger units, through economies of scale
- Future modifications or expansions (relating to flue-gas cleaning systems of incinerators, for example) are likely to be less expensive
- Where privatization of facilities is seen as a desirable option, this can be achieved more efficiently on a regional basis than for numerous small units

- It will be easier for the relevant government agencies to supervise and monitor the facilities
- Air pollution may be more easily kept to a minimum at a centralized plant (costs of monitoring and surveillance as well as flue-gas cleaning, for example, will be reduced)

314. At present the following are the facilities available at Uva Province

Table 5.8: HCW Treatment/Disposal Capacity Already Installed in the Uva Province

Province	HCF	Equipment established	Remarks
Uva	Badulla TH	Metamizer	Functioning
		Incinerator	Functioning
	Monaragala GH	Metamizer	Green Award Winner
	Diyatalawa BH	Incinerator	Functioning
	Haputale BH	Incinerator	Functioning
	Bandarawela BH	Incinerator	Functioning

315. The amounts of HCW generated at each of the hospitals, their collection, storage, and treatment methods are detailed in Annex 6.

D.2 Possible contamination of infections by health care staff

316. Occupational exposures to blood, body fluids or laboratory specimens containing pathogens are considered possible cases of occupationally acquired infections.

317. The highest rates of occupational injury among all workers exposed to health-care waste are reported by cleaning personnel and waste handlers. The most numerous work-related injuries among health-care workers and waste collectors are sprains and strains caused by lifting and overexertion, and not from the hazardous components of health-care waste.

Measures to mitigate the impacts

318. The following are proposed as mitigation measures:

- Ensure yellow bags are correctly closed and tied with an overhand balloon knot so that they are leak-proof before being moved.
- Yellow bags should be placed in a container with a secure lid.
- All sharps containers should be fully closed and placed in a bag and then in a container. Preferably, single-use disposable sharps containers should be used in place of reusable sharps containers.
- Single-use gloves (nitrile or latex) and gowns should be discarded after each use and not reused
- All who handle health care waste should wear appropriate PPE (boots, apron, long-sleeved gown, thick gloves, mask, and goggles or a face shield) and perform hand hygiene after removing it. Careful and continuous use of the relevant health & safety equipment (gloves, masks etc.) – an important measure here is to make sure that the workers are removing masks and gloves without getting in contact with them; usually, this means with the help of someone else. Protective equipment for eyes is also beneficial for avoiding infections.
- Frequently touched surfaces throughout the reception area should be cleaned regularly.

- Bathrooms should be cleaned and disinfected at least once a day. The healthcare workers and the laboratory staff should have separate toilets and bathrooms (which should never be used by infected persons)
- Well-trained permanent staff are responsible for packaging waste to transport for treatment facilities.
- Each bag must be hand-tied by gathering and twisting the neck of the bag and using a tie or hand knot to secure the bag, and each container must be securely closed.
- Improperly packaged containers or damaged containers will be denied pick up until packed them properly.
- Bins used for disposing of infectious waste must be disinfected before reuse by any means effective for the infectious substance the container previously contained.
- Direct contact (without gloves) with bins or bags should be avoided in any case.
- Uniforms should be daily changed - cleaning of work clothes and shoes is minimizing the possibility of dispersing the virus in the air – make sure not to shake clothes – wash them at a temperature of at least 60 ° C with common detergents, add disinfectants if possible.
- Put a disposable set of gloves, on a daily basis, in direct contact with skin, before wearing usual work gloves.

D.3 Generation and disposal of wastewater generated from the newly constructed building

319. Wastewater generated from the new facilities provided by the HSEP, if discharged directly to the environment shall contaminate soil and groundwater. Health care wastewater in the primary sector consists of (i) black water containing high concentrations of faecal matter, urine, and toxic chemical with high potential for pollution, and (ii) greywater containing discharge from washing, cooking, bathing, laundering with low potential for pollution. None of the hospitals included in the project has piped sewerage or wastewater treatment (wastewater treatment plant at Haputale DHB is non-functional at present), and they are disposed of in septic tanks and soakage pits built on-site. Currently, bed occupancy rates in DHs are very low. However, this is expected to improve after the project contributing to an increased load of wastewater discharged. Many of the PMCUs have only one toilet presently, and the proposed upgrades would include several other toilets for patients and staff separately.

320. Sewage generated in HCFs is potentially hazardous and infectious as they carry pharmaceutical chemicals and disease-causing bacteria, viruses, and parasites. There are many risks associated with current sewage disposal practices which are likely to worsen with higher utilization of the primary sector, especially with septic tanks that are not watertight, old, and leaking and where the groundwater table is naturally high (seasonally or permanently). The risks include (i) contamination of local drinking water sources, (ii) degradation of aquatic habitats, and (iii) outbreaks of water-borne diseases. Besides, pharmaceuticals, detergents, antiseptics in wastewater may act as endocrine disruptors and antibiotics can breed antibiotic-resistant pathogens once they are released in the environment without prior treatment.

321. The wastewater generated at new facilities should be connected to existing wastewater treatment and disposal systems if they have the capacity for additional loads. Also, such a connection is possible only if the existing systems are properly functional. If any of these

prerequisites are not met, then there is a need to design an appropriately designed wastewater collection, treatment, and disposal system to avoid environmental pollution.

322. Connecting the new toilets to existing wastewater treatment systems (septic/soakage systems) may not be possible for some of the hospitals (see Table 5.9) for the current condition of existing septic tanks.

Measures to mitigate the impacts

323. All the hospitals are small-scale, and ideally, the wastewater treatment systems should include a septic tank and a soakage pit/trench. All the designs of wastewater treatment systems should be designed and constructed based on the Code of Practice: Sri Lanka Standards 745: Part I and Part II (2004). The following points should be noted:

- A soakage pit as the final disposal method is appropriate if the seasonal high groundwater table is at least 1.2 m (minimum) below the bottom level of the septic tank.
- The blackwater should first be sent through a septic tank, and then the settled wastewater has to be transferred to the soakage arrangement. The greywater may be directly sent to the soakage arrangement.
- The interval for desludging should be taken as one year. However, given the size of the septic tank and the small amount of blackwater generated at the newly constructed facilities, the desludging time is expected to be longer.
- The volume of septic tanks should be at least 1 m^3, which is the minimum volume for a septic tank specified by the SLS745.
- Soakage pits should be located at a lower elevation with respect to shallow wells and should be at least 50 feet away from such wells.

324. The septic tank/soakage arrangement as the wastewater collection and disposal method is appropriate for most of the hospitals, and no adverse impacts are expected. Desludging should be done as and when needed, however, given the size of the septic tank and the small amount of blackwater generated at the laboratory, the desludging time is expected to be extended.

325. As can be seen from Table 5.9, soakage pits may not be an option for locations such as Rathmalgaha Ella, where the existing soakage pits located near the canal are overflowing during rainy days, when the canal flows full and at Nannapurawa where the groundwater table is high during rainy days due to capillary fringe. Seepage trenches, seepage beds or constructed wetlands are more suitable for such locations. If the treated effluent is disposed to the nearby canals or drains, then constructed wetlands or biofilters are more appropriate. However, if constructed wetlands are used for wastewater treatment, edible plants should never be used as the emergent vegetation line.

326. The DSC is expected to design location-specific and appropriate wastewater collection, treatment and disposal systems based on the SLS745.

Table 5.9: Condition of existing wastewater collection and disposal facilities

Hospital/HCF	Existing on-site disposal method	Remarks
Badulla District		
Haputale DHB	The treatment plant is not functional. Some of the sewers are leaking, and soakage pits are overflowing.	May not be possible to connect to the existing system. The new treatment system is needed.
Uva Paranagama DHB	Septic tanks and soakage pits of existing buildings are functional. No signs of overflowing.	The old building earmarked for renovation has an old septic tank which can be rehabilitated.
Carklees DHC	The septic tank for hospital and quarters is functional, however, located very close to the edge of the embankments towards the road.	A new treatment system is needed for the proposed building.
Metigahatenna DHB	The septic tank located between the dental clinic and the proposed site is functional.	Explore the possibility of connecting the new toilets of the proposed building to the nearby septic tank.
Lunugala DHB	Septic tanks and soakage pits of existing buildings are functional. No signs of overflowing.	The old building earmarked for renovation has an old septic tank which can be rehabilitated.
Monaragala District		
Kotagama PMCU	Septic tank of the existing building is located at a higher elevation.	A new treatment system is needed for the proposed building.
Nannapurawa PMCU	Septic tanks and soakage pits of existing buildings overflow during the rainy season. The soil is moist, probably due to capillary fringe.	Percolation test has to be carried out to design the soakage arrangement. The new treatment system is needed for the proposed building with properly designed soakage system.
Medagama DHB	Soakage pits are overflowing.	A new treatment system is needed for the building earmarked for renovation.
Pitakumbura DHB	Septic tanks and soakage pits of existing buildings are functional. No signs of overflowing.	Explore the possibility of connecting the new toilets of the proposed building to the nearby septic tank. If not, a new treatment system is needed for the proposed building.
Rathmalgaha Ella PMCU	Soakage pits of existing buildings located close to the canal overflow during the rainy season.	A new treatment system is needed for the proposed building with properly designed soakage system or a constructed wetland. There is a shallow well located close to the site.

Note: The above information has to be verified, and the DSC is expected to propose suitable location-specific designs for each HCF.

D.4 Provision of water supply

327. The proposed buildings have to be supplied with a dependable water supply. Table 5.10 shows the sources of water supply for each HCF and its adequacy as observed during field visits.

Table 5.10: Condition of existing supply facilities

Hospital/HCF	State of existing water supply	Remarks
Badulla District		
Haputale DHB	Water is supplied from a nearby natural spring surrounded by tea estates	The quantity is sufficient; however, the water quality results show that the faecal coliform and *E.coli* levels are high Storage tank for the new building is needed.
Uva Paranagama DHB	Sufficient amount of water is available - Ambagasdowa WSS (NWSDB)	Storage tank for the new building is needed.
Carklees DHC	Water is supplied from the Carklees Estate water supply, of which the source is a natural spring.	Although the quantity is sufficient, hospital authorities suspect the water quality is not acceptable (possible faecal contamination). Storage tank for the new building is needed.
Metigahatenna DHB	The water source is a natural spring.	Quantity is sufficient; however, the water quality has note being tested// Storage tank for the new building is needed.
Lunugala DHB	Water connection from NWSDB & tube well.	NWSDB supply is sufficient. Storage tank for the new building is needed.
Monaragala District		
Kotagama PMCU	Water from a community scheme. The shallow well is not in use.	Shallow well can be rehabilitated and put into use as the community water supply is not dependable.
Nannapurawa PMCU	Water connection from NWSDB & tube well.	NWSDB supply is intermittent. Storage tank for the new building is needed.
Medagama DHB	Water connection from NWSDB & tube well.	NWSDB supply is satisfactory. The available water tanks can cater to the renovated building as needed.
Pitakumbura DHB	Shallow well & NWSDB bowsers	The shallow well water is not sufficient during the dry months.
Rathmalgaha Ella PMCU	Shallow well, tube well, rainwater harvesting tank	Although the quantity is sufficient, the tube well water is hard and turbid). Storage tank for the new building is needed

328. There should be water storage of which should be sufficient for at least 1½ –2 days). The water quality of supplies should conform to SLS614 (2013): Sri Lanka Standards for Potable Water (Annex 8a).

VI. Consultation, Participation, and Information Disclosure

A. Consultation and participation during project preparation

329. The public consultation process included: (i) identifying project-affected parties; (ii) discussing/providing them with sufficient information regarding proposed project activities; (iii) creating opportunities and mechanisms whereby they can participate and raise their issues, comments, and concerns with regard to the proposed project activities; (iv) giving the stakeholders feedback on findings and recommendations; and, (v) ensuring compliance to process requirements of the environmental and related legislation.

330. Meaningful stakeholder consultations have been held during project preparation and will continue throughout project implementation. Stakeholders consulted during the preparation of the sub-project included the following.

- officials of the HSEP at PMU levels and PIU (Uva Province) level
- Uva Provincial Health Services
- representatives of the DSC who are responsible for designs
- most importantly, the medical offices of the beneficiary hospitals and several other key health care staff and hospital users.
- PHI of the area
- Grama Niladhari of the area
- Mid-wife of the area

(Note: the list of persons consulted are listed in Annex 2).

331. Stakeholder consultations have allowed opportunities to incorporate needs/views of the stakeholders in the final sub-project designs by the DSC and to provide proper justification for the proposed components included in each of the sub-projects. In addition, the consultations have been instrumental in identifying the environmental impact and propose appropriate mitigation measures. Moreover, the entire process has resolved much of the issues that can arise during implementation, thereby enhancing the 'ownership of the project'. Meaningful stakeholder involvement and participation in decision making contributes to project sustainability.

332. Along with field assessments carried in preparation of this IEE, the Environmental Consultant carried out individual studies with the objective of (i) understanding the viewpoints of hospital staff and the public on the need for enhanced services by each of the beneficiary HCFs, (ii) regarding current practices of handling and managing hazardous health care waste and wastewater, as well as challenges faced with regard to the availability of infrastructure services, and (ii) respond to their concerns and suggestions during the early stages of the project thereby reducing any objections towards the project, incorporate any valuable suggestions by the public into the design in order to reduce any adverse impacts to the environment

333. The key stakeholders to be consulted during project implementation and subsequent operations include the DMO/MOIC/MOs of each beneficiary hospital and health care staff of these hospitals, the staff of regional and provincial health services, other government bodies. The consultation process carried out so far has solicited views and information from medical and nursing staff of each of these hospitals, the staff of the regional/provincial directorates of health services. The information thus obtained, where relevant, has been incorporated into the IEE.

B. Disclosure of Information

334. Disclosure of information at an early stage of the project has many benefits such as to avoid any objections by the public towards successful project implementation, passing of misinformation into the hands of the public through local NGOs. Information is disclosed through a public consultation and making relevant documents. Public locations.

335. According to the requirements of the ADB SPS for Environment Category B projects, the following will be disclosed on the ADB website before the Management Review Meeting (MRM) is held or equivalent meeting or approval of the respective project if there is no MRM:

(i) final IEE
(ii) a new or updated IEE and corrective action plan prepared during project implementation, if any, and environmental monitoring reports.

336. While stakeholder consultations will be the primary source of information disclosure, the PMU will ensure that environmental safeguards documents prepared in support of project implementation such as IEEs, HCWMPs and monitoring reports are disclosed via its website. Besides, the PMU will take necessary steps to make these documents available in appropriate locations, in a manner that is timely and in a language that is understood by local community/affected people for those who do not have access to the internet. The PMU will also send a written endorsement to ADB for disclosing these documents on the ADB website.

C. Procedures for Dealing with Chance Finds

C.1 Chance found Flora and Fauna

337. The contractor will take reasonable precaution to prevent workers or any other persons from removing and damaging any flora (plant/vegetation) and fauna (animal) and hunting of any animal.

338. If any wild animal is found near the construction site at any point of time, the contractor will immediately upon discovery thereof acquaint the DSC and/or PIU and carry out the instructions for dealing with the same.

339. Only if needed, DSC/PIU will report to the nearby Forest Department /Department of Wildlife Conservation (range office or divisional office) and will take appropriate steps/ measures if required in consultation with the officials.

C.2 Chance found Archaeological Property

340. All fossils, coins, articles of the value of antiquity, structures, and other remains or things of geological or archaeological interest discovered on the site shall be the property of the Government. They shall be dealt with as per provisions of the relevant legislation.

341. The contractor will take reasonable precautions to prevent his workmen or any other persons from removing and damaging any such article or thing. He will, immediately upon discovery thereof and before removal acquaints the PIU through the DSC of such discovery and carry out the instructions for dealing with the same, waiting which all work shall be stopped. The PIU will seek direction from the Archaeological Department of Archaeology of Sri Lanka and inform the DSC to follow the Chance Find Procedures set forth. (Note: Annex 7 summarizes the Procedure for Obtaining Written Permission from the Department of Archaeology).

VII. Grievance Redress Mechanism

342. A project-specific grievance redress mechanism (GRM) will be established to receive, evaluate, and facilitate the resolution of affected person's (AP's) concerns, complaints, and grievances about the social and environmental performance at the level of the project. The GRM must be established before any site works commence.

343. The objective of the GRM is to provide a timely and transparent mechanism to raise and find a resolution to social and environmental issues arising out of the project. While the following institutional mechanism is recommended for project-specific grievances, it will not replace, override or bypass other GRM systems that exist at the government/community level but provide another route through which concerns of affected parties can be swiftly addressed.

344. The proposed mechanism will have three tiers at different levels linked to the project's implementation hierarchy.

(i) **Tier 1:** Project Implementation Unit (PIU) at the provincial level will be the first level to resolve grievances. The Deputy Project Director (DPD) will be the focal point for grievance redressal.

a) On receiving a grievance, the PIU will (i) Enter the grievance in the Complaints Register, (ii) open a grievance file for the specific case and, (iii) close the grievance filling a closure sheet that will be signed by the complainant agreeing that the concern has been satisfactorily resolved.

b) Grievances will be attended to within a week based on on-site investigations and consultations with relevant parties. All grievances will be recorded appropriately with personal details unless otherwise requested.

(ii) **Tier 2:** The Deputy Project Director (DPD) of the PIU will be the focal point for grievance redressal of tier 2. The PD/DPD in consultation with the Environmental Specialist of the PMU will activate the second level for those grievances that are not resolved at tier 1. This tier will consist of a Grievance Redress Committee (GRC), the composition of which will be decided by the PD. The Environmental Specialist of the PMU will be responsible for processing and placing all papers before the GRC.

345. The GRC must be appointed and established before the commencement of site works. The written grievance will be forwarded to the GRC who will call a hearing, if necessary, with the complainant. The process will facilitate resolution through mediation. The GRC will meet as required and direct the field level with clear instructions and responsibilities to attend to the agreed actions within two weeks of the meeting. The contractor will sit in the GRC as an observer.

(iii) **Tier 3:** If a grievance cannot be resolved directly by the first two tiers, the affected person can seek alternative redress through other means such as the Government's judicial system.

346. It is essential to ensure that the project's mechanism for grievance redressal is widely disseminated to the public and other affected stakeholders through (i) public consultation meetings (ii) media advertisement (iii) locally erected notices and other means.

VIII. Institutional Arrangements and Environmental Monitoring Plan

A. Implementation arrangements

347. The MOHIMS will be the implementing agency through the PMU of the Health Sector Enhancement Project (HSEP). A national project steering and coordination committee chaired by the Secretary, MOHNIM will provide policy direction to the project. The additional secretary, MOPCLG, will act as the vice-chair of the steering committee and the provincial chief secretaries and provincial health directors will serve as committee members. The PMU, headed by a Project Director (PD), will be responsible for the overall coordination, management, administration, and project implementation and monitoring. At each province level, a project implementation unit (PIU) will be established and will be headed by a Deputy PD.

348. Within the above structure planning, implementation and supervision of environmental safeguards will take place at three levels:

(i) **Ministry of Health and Indigenous Medical Services (through the PMU)** – The overall responsibility of ensuring compliance with the EMP and monitoring plan will be borne by the PMU of the Health Sector Enhancement Project (HSEP). It will be supported by a part-time environmental consultant who will ensure that the EMP is finalized (based on final layouts and designs) and included in the bid documents, provide awareness and training to the contractor, monitor EMP implementation, coordinate with the respective PIUs, attend to grievances and prepare monitoring reports, as required.

(ii) **Provincial Ministry of Health/Provincial Directorate of Health Services (through local PIUs)** - The responsibility of day to day planning, implementation, and supervision of environmental safeguards specific to sub-projects will be borne by the PIUs. An engineer will be appointed as the focal point for coordinating with the environmental specialist of the PMU on monitoring and reporting. Specific formats for monitoring and reporting will be prepared by the environmental specialist and shared with the PIUs.

(iii) **Contractor –** Implementation of EMPs will primarily be the contractor's responsibility (apart from those provisions relating to technical designs and other specified tasks indicated in the EMPs). For this, the contractor will nominate a site engineer as the focal person who will be directly responsible for ensuring compliance with the EMP during construction.

349. The PMU will function as the project office for the MOHIMS, carry out sub-project appraisal and approval and ensure compliance with ADB loan covenants. A qualified specialist, part-time dedicated for environmental safeguards will be attached at the PMU throughout the project implementation to:

- Assist the PMU/PIUs in the overall implementation of the project's EARF.
- Review and endorse the safeguards screening checklist and conduct follow up assessments (IEE).
- Assist the PMU in checking the provisions of civil works contracts to ensure that EMPs are integrated into the bidding documents.
- Monitor compliance of the civil works contractors with EMP provisions.

- Prepare and submit to the ADB environmental monitoring reports for review and disclosure.
- In case unanticipated environmental impacts become apparent, advice the MOHNIM and ADB the needed assessment to be undertaken and resources to implement mitigation measures.
- Assist the PD in all matters pertaining to environmental safeguards.

B. Institutional Capacity Development

350. The environmental specialist at the PMU will be responsible for designing and delivering a training program during the first year to the staff of the PIU who will assist in filling the environmental checklist. The training will cover basic principles of screening and safeguards categorization, environmental assessment and management, monitoring methods and tools.

351. The PMU will also design and deliver a comprehensive training and awareness building program for HCWM to all the HCFs, both preventive and curative. In doing so, it will collaborate closely with PDHS and RDHS.

C. Environmental Management Plan

352. The impacts and mitigation measures discussed in chapter V has been summarized into an environmental management plan, which as presented as Annex 3 of this IEER. This EMP is in line with the requirements as stipulated in paragraph 82 of the EARF (i.e. to include a comprehensive EMP in the IEE report).

D. Environmental Monitoring Plan

353. An environmental monitoring plan has been developed for monitoring the implementation of EMP. This environmental monitoring plan is presented as Annex 4 of this report.

354. Formats needed for environmental monitoring are provided as Annex 10. This includes forms for monthly monitoring and quarterly monitoring to be filled by the Contractor, DSC, and the Environmental Specialist.

IX. Conclusion and Recommendations

A. Conclusion

355. It was observed during field visits that the sites proposed for the civil works for Round 2 sub-projects of the HSEP are not located within or adjacent to areas that are ecologically or environmentally sensitive. The proposed plots either bare land (Haputale, Carklees, Pitakumbura, Rathmalgaha Ella, Kotagama and Nannapurawa) or lands which are available after demolition of old buildings or parts of buildings (Lunugala, Metigahatenna, part of Uva Paranagama sub-project) located within the boundaries of existing hospital premises or located at the backyards of the premises. At two locations, renovations are proposed to old buildings (Medagama and part of Uva Paranagama sub-project). The five sites in Monaragala District are flat; however, peripheral areas of the site at Pitakumbura has mild slopes. The sites in Badulla District have sloping terrain, other than the sub-project location at Uva Paranagama.

356. It is evident that most of the environmental issues during the construction phase is related to localized and temporary impacts such as (i) elevated levels of dust, noise, vibration, (ii) pollution due to solid waste disposal including potentially hazardous components such as discarded construction material, construction wastewater and operation of labour camps, (iii) onsite drainage impairment, (iv) soil erosion and potential for alteration of surface drainage patterns, and (v) risk of occupational health and safety for construction workers. It has to be noted that the type of constructions proposed for all the ten sub-projects are small in scale, and therefore these impacts can be minimized and mitigated with the adequate implementation of the provisions given in the EMP. Moreover, the period of construction is also not long due to simple nature of the construction.

357. As documented in this IEE Report, the current practices of hazardous health care waste management in the hospitals are inadequate and unhygienic. While a reasonable attempt is made at segregating waste according to the category at the point of generation, the segregation is not maintained throughout. Finally, the waste is openly burnt at all the sites that were visited. With the increased collection of clinical and infectious waste once the new facilities are established, such inappropriate waste management at HCFs are bound to increase raising the risks for public health and the environment.

358. Findings of the IEE confirm that the positive impacts of the project far outweigh any negative impacts arising out of establishing new facilities at the ten HCFs. None of the environmental impacts identified is irreversible and widespread; instead, they are localized, temporary in nature and short term. With proper site management and safety practices, these impacts can be effectively managed. Stakeholder consultations have revealed that the demand for the better and increased quality of healthcare services are urgently needed in the country. As such, the project will be a positive step towards providing better health services to the country as well as prepare the country to face emerging health sector challenges successfully in the coming decades.

B. Recommendations

359. Therefore, the IEE recommends that:

(i) Implementation of the EMP and the EMoP is essential to make sure that any environmental impacts are effectively mitigated. Noise, dust, and air-borne fugitive dust should be controlled effectively during construction.

(ii) Completion of the construction work at the shortest possible time would minimize

most of the impacts that will affect the hospital users.

(iii) Health care waste management be given priority and proper strategies to be developed and implemented to manage the issue as well as to build capacity and awareness within hospital staff for HCWM. The hospital has to implement an appropriate way of waste HCWM without delay.

(iv) It is required to do a detailed waste audit in every unit of the hospitals to identify waste quantities generated, characterization, need for management, appropriate equipment/technology and associated costs. Without such essential information, it is difficult to assess the need and introduce sustainable healthcare waste management system.

(v) Short and long term healthcare waste management plans need to be established at the institutional level. There is an urgent need to implement the HCWM action plan and scale up healthcare waste management, by preparing HCWM plans for each facility, setting up of monitoring procedures, and strengthening capacity at all hospitals.

(vi) It is required to have financial assistance along with technical guidance for installing sustainable technology for the management and disposal of healthcare waste at the hospital premises.

(vii) Proper sewage collection and disposal systems by installing appropriately designed septic tank and a soakage arrangements are needed for the HCFs, including the new facilities that are provided at each HFC. If septic tanks/soakage arrangements are not feasible, small-scale packaged treatment systems should be installed.

(viii) The new buildings are to be supplied by a dedicated electricity connection, water supplies and telecommunication facilities by the HFC.

(ix) Additional water storage facilities are needed at all the HFCs. Water supply facilities be improved in HFCs that face severe water shortages and cannot even maintain basic hospital hygiene. This could be done through supporting feasibility studies for alternative water sources and implementing them on a priority need basis.

ANNEX 1: Environmental Screening Checklist

Instructions:

A. 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 (SDES) for endorsement by Director, SDES and for approval by the Chief Compliance Officer.

(ii) 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.

Basic Information on the Health Care Facility (HCF)

Name of the HCF	
Location	Province District Divisional Secretariat Division
Type of HCF	
Number of beds and bed occupancy rate	
No of out-patients a day	
No of staff	
Proposed rehabilitation interventions	
Contact person in the HCF	

PART 1

B. General construction related impacts

Screening Questions	Yes	No	Remarks
C. Project Siting Is the project site within or adjacent to any of the following areas:			
▪ Densely populated area			
▪ Cultural heritage site			
▪ Protected Area			
▪ Wetland and water bodies			
▪ Mangrove			
▪ Estuarine			
▪ Buffer zone of protected area			
▪ Special area for protecting biodiversity			
D. Potential Environmental Impacts Will the Project involve or cause…			
▪ Encroachment on historical/cultural areas?			

Screening Questions	Yes	No	Remarks
▪ Encroachment on precious ecology (e.g. sensitive or protected areas)?			
▪ Unsatisfactory raw water supply			
▪ Conflicts in abstraction of water with other beneficial water uses of the same sources			
▪ Over pumping of groundwater			
▪ Increase in production of general solid waste			
▪ Increase in production of hazardous waste			
▪ Increased sewage flow			
▪ Generation of sludge from waste treatment plants			
▪ Use of or dismantling of structures that contain Asbestos			
▪ Noise and dust from construction activity?			
▪ Soil erosion and silt run off from construction activity?			
▪ Accident risks associated with increased vehicular traffic?			
▪ Increased noise and air pollution resulting from increased traffic volume?			
▪ Risks and vulnerabilities related to occupational health and safety due to physical hazards during project construction and operation?			
▪ Requirements for disposal of fill, excavation, and/or spoil materials?			
▪ Loss of large trees (more than 30 cm DBH); how many?			
▪ Long-term impacts on groundwater flows as result of needing to drain the project site prior to construction?			
▪ Long-term impacts on local hydrology as a result of building hard surfaces in or near the building?			
▪ Large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?			
▪ Risks to community safety caused by fire, electric shock, or failure of the buildings safety features during operation?			
▪ Risks to community health and safety caused by management and disposal of waste?			
▪ Procurement of x-ray machines or any other equipment containing radioactive material			
▪ Procurement of incinerators?			
▪ 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?			

Part II

Health Care Waste Assessment

Generation

Source	Waste type[6]					
OPD	**General**	**Sharps**	**Infectious**	**Chemical**	**Pathological**	**Pharmaceutical**
Medical Ward						
Surgical Ward						
Theatre						
ETU						
Laboratory						
Pharmacy/Drug Store						
Labor room						
Other						
Kg/Day						

Waste Segregation

Questions	Yes	No	Description
Is clinical waste segregated from general waste? If yes, into which categories are HCW separated?			No segregation
			General waste
			General Infectious waste
			sharps
			Pathological waste
			other
Where does the segregation take place?			
What type of bags/primary containers are used in segregating wastes?			
What type of labelling/color coding is used in segregation			
What types of equipment are used for internal transport of wastes?			
Where is the segregated waste stored until final disposal?			
Describe the final disposal method	Sharps		
	Infectious waste		
	Pathological waste		
	General waste		
	Other		

[66]Sharps: items that could cause cuts or puncture wounds, including needles, hypodermic needles, scalpel and other blades, knives, infusion sets, saws, broken glass, and nails; Pathological waste: consisting of tissues, organs, body parts, human fetuses and animal carcasses, blood, and body fluids; Infectious waste: suspected to contain pathogens (bacteria, viruses, parasites, or fungi) in sufficient concentration or quantity to cause disease in susceptible hosts. Chemical waste: consists of discarded solid, liquid, and gaseous chemicals, used for diagnostic and experimental work and for cleaning, housekeeping, and disinfecting procedures; Pharmaceutical waste: expired, unused, spilt, and contaminated pharmaceutical products, drugs, vaccines, and sera that are no longer required and need to be disposed of; Radioactive waste: waste that contains radioactive material.

Waste handling and treatment

Equipment	Yes	No	Description/Capacity/Number of units	Location (within hospital or nearest facility with approximate distances)	Status (used/functioning or not)
Incinerator					
Metamizer					
Autoclave					
Lined burial pits					
Unlined burial pits					
Waste cards					
Color-coded waste bins					
Waste storage space					

Waste Handling

Questions	Yes	No	Remarks
Is there a designated person (s) responsible for organization and management of waste collection, handling, storage, and disposal at the hospital administration level?			
Does the waste management staff have job descriptions detailing their tasks?			
Has he/she received any training on hospital waste management?			
Are there clearly defined procedures for collection and handling of wastes from specified units in the hospital?			
Does your hospital have a written Waste Management Plan?			
Are waste handlers provided with adequate personal protective equipment (PPE)			

Water supply and sewerage

Questions	Yes	No	Remarks
Does the hospital have a sewer treatment plant? If not, is it disposed to on-site soakage pt.?			
If a sewer treatment is available, when was it built?			
Does the HCF have a water supply provided by drinking water scheme?			
Is the water treated?			
Is the water supply adequate?			
Does the HCF have Reverse Osmosis units for treating raw water supply?			

Screening decision and recommendation

Project Safeguard Category	**A**	**B**	**C**
	IEE needed		
	EIA needed		
	Any other		
Recommendations for improving health care waste management (in line with the district strategy envisioned by the RHDS)			

Details of person conducting screening

Screening checklist completed by ***Name/Designation/Contact information***	**Date** ***Signature***
Screening report reviewed and approved by ***Name/Designation/Contact information***	**Date** ***Signature***

Annex 2: Stakeholders, Persons/Officials met during fled visits for consultations

Name	Designation
Dr. Mrs. J.C.M. Tennekoon	Uva Provincial Director of Health Services Deputy Project Director (HSEP)
Eng. Jayampathi Jayawardhana	Project Engineer, HSEP, PIU – Uva
Eng. Themiya Bandara	Civil Engineer - Uva; Design and Supervision Consultants, Resources Development Consultants (Pvt) Ltd.
Medagama DHB	
Dr. K.H.R. Indrajith	DMO
Mrs. R.M.A. Ratnayake	Nursing Officer-in-charge
Mrs. M.I. Swarnalatha	Nursing Officer
Mr. K.S.M. Gunaratne	SPHI, Medagama MOH Office
Mrs. S.M. Jayalath Nona	Mid-wife
Pitakumbura DHC	
Dr. R.M.D.J.K. Premawardena	DMO
Dr. Sapthala	MO
Mr. W.M. Gunasinghe	Dispenser
Mrs. M.M.H.S Bandara	Nursing Officer
Mr. Priyantha Sameera	PHI, MOH Office
Mrs. Kanthi Menike	Mid-wife
Kotagama PMCU	
Dr. H.M.K. Herath	MOIC
Mrs. S.A.M. Niroshini	Pharmacist
Mrs. A.M. Geethani Menike	Health Care Assistant
Mrs. L.Y. Lalitha	Health Care Assistant
Mrs. Chandrani Menike	Mid-wife
Rathmalgaha Ella PMCU	
Dr. N.N. Wickramaratne	MOIC
Mr. K.M.R.P. Ariyasena	Pharmacist
Mrs. J.D.S.M. Kumari	Health Care Assistant
Mrs. T.B.S. Menike	Health Care Assistant
Nannapurawa PMCU	
Dr. S.P.S. Gunasekara	MOIC
Mrs. Priyangika Gunaratne	Health Care Assistant
Mrs. Chandrika Malkanthi	Health Care Assistant
Mr. W.M. Somaratne	PHI
Mrs. Chitra Nalni Wijesinghe	Mid-wife
Haputale DHB	
Dr. Sanjeewa U. Samaraweera	DMO
Dr. Kasun Udarangika	MO
Mr. Samantha Dissanayake	Development Officer
Mrs. Shivani	Pharmacist
Mrs. Swarna Senadhira	Mid-wife
Carklees DHC	
Dr. J. M. Priyantha Sumanasekara	MOIC
Mr. K.M. Sarath Kumara	Pharmacist
Mr. M.M.C.D. Maduranga	PHI
Mrs. Madarika	Mid-wife
Uva Paranagama DHB	

Dr. Kasun Bandara	DMO
Dr. Dhammika Piyasoma	RMO
Dr. L.A. Niroshana	MO
Dr. Chinthaka Wijesooriya	MO
Dr. Thusitha	Dentist
Mr. Rohana	Pharmacist
Mrs. Yamuna Kumarihamy	Mid-wife
Metigahatenna DHB	
Dr. A.I. Ranasinghe	DMO
Dr. J.J. Ramanayake	MO
Mrs. W.M.C. Weerathunga	Nursing Officer
Ms A.M.G. Dhanushka	Dispenser
Mr. Asanka Sanjeewa Leelaratne	Health Care Assistant
Lunugala DHB	
Dr. D.M. Samarasinghe	DMO
Mrs. Himali Udayakumari	Development Officer
Mr. Asela Jayasinghe	Dispenser

Annex 3: Environmental Management Plan

No	Activity/Env. impact	Mitigation measures	Implementation responsibility	Monitoring responsibility	Indicative cost of mitigation
Pre-construction stage					
1	Proper scheduling and planning of work (Refer Table 5.1 for detailed descriptions)	Proper coordination to ensure timely completion of the completion and minimizing work delays by obtaining prior approvals/ consents	DSC to obtain Permits/approvals/ consents/no-objection letters for sub-projects (Refer Table 1.4 for the list)	DPD and Project Engineer of PIU-Uva Province	Included in the DSC's contract Any regulatory fees or tax payments associated with obtaining approvals/permits should be borne by the PIU as part of the project cost
		Minimizing delays related to the selection of locations for project interventions	DSC The Contractor is expected to liaise closely with the DSC	Project Engineer, PIU-Uva Province to monitor to avoid delays	No costs involved
		Selection of areas for work camps, stockpile areas, storage, and disposal areas	The Contractor is expected to liaise closely with the DSC when selecting such sites.	Hospital Authorities Project Engineer, PIU-Uva Province and Environmental Specialist, PMU to monitor	No costs involved
		Solving any issues that lead to delays in the finalization of the designs of the interventions	DSC The Contractor is expected to liaise closely with the DSC	Project Engineer, PIU-Uva Province to monitor to avoid delays	No costs involved
		Planning the work with due consideration given to climatic conditions	The Contractor	DSC to check	No costs involved
2	Minimizing the removal of trees	All the project components/ interventions /activities proposed should ensure minimum disturbance to the	DSC during design stages	Hospital Authorities	No costs involved

No	Activity/Env. impact	Mitigation measures	Implementation responsibility	Monitoring responsibility	Indicative cost of mitigation
		removal of trees	The Contractor during mobilization and construction stages	Project Engineer, PIU-Uva Province and Environmental Specialist, PMU to monitor	
3	Avoiding impacts due to landslides and slope instability	Recommendations of the NBRO should be obtained for projects in Badulla District once the designs are completed	DSC	Project Engineer, PIU-Uva Province	No additional costs involved
4	Planning for interruption of services of the HFC due to the demolition/ removal of any existing structure/part of structures of the HCF and shifting of utilities	Any interruption of utility services (water supply, wastewater collection and disposal, electricity, telecommuting services) should be restored with alternative means. Also, the functional connectivity of different hospital units needs to be restored for uninterrupted services of the hospital.	The Contractor	DSC to monitor and report to Project Engineer, PIU-Uva Province	Cost for shifting and/or alternative supply of utilities has to be costed by the Contractor
5	Designing of proper stormwater drainage systems	The rainwater drainage has to be designed appropriately for all the site before commencement of the work. Any alterations, damages, blockages caused to the existing drains should be considered in providing alternative drainage pathways.	DSC for designs The Contractor to obtain proper guidance from DSC	Project Engineer, PIU-Uva Province	Design costs included in DSC's contract. Cost for shifting and/or new surface drainage networks has to be costed by the Contractor
6	Designing of proper healthcare waste (HCW): sorting, storage, and disposal	Safe handling of HCW during collection, storage, transportation, treatment, and disposal of HCW is of paramount importance. Designs and plans for such safe handling and disposal of HCW have to plan early.	This aspect is supposed to addressed separately as another activity under the HSEP and will be reported elsewhere. However, the DSC should ensure that proper spaces are provided for collection and storage. Project Engineer, PIU-Uva Province need to verify this aspect before approval of designs.		
7	Designing of a wastewater treatment system	Wastewater generated from the newly constructed facilities needs to be disposed of appropriately. Design of an adequate wastewater collection and on-site treatment system shall reduce such contamination.	DSC to design wastewater collection, treatment, and disposal systems for newly constructed facilities	Project Engineer, PIU-Uva Province	Design costs included in DSC's contract

No	Activity/Env. impact	Mitigation measures	Implementation responsibility	Monitoring responsibility	Indicative cost of mitigation
8	Planning for provision of adequate and uninterrupted electricity, water, and telecommunication facilities.	The proposed facilities should be supplied by an appropriately laid out and designed electricity connection, water supplies, wastewater collection and disposal, and telecommunication facilities. Impacts during construction	DSC to plan the systems for newly constructed facilities	Project Engineer, PIU-Uva Province	No additional costs involved
9	Conducting surveys prior to commencement of the proposed civil works	Land surveys and contour map of the proposed land plot	DSC	Project Engineer, PIU-Uva Province	No additional costs involved
		Initial status photography and video and crack survey (only if needed)	The Contractor	DSC and hospital authorities	Need for additional costs involved in the crack survey LKR 10,000–25,000
		Existing survey of utilities and shifting	The Contractor	DSC and hospital authorities	No additional costs involved
		Visual surveys of the peripheral areas of the site are needed for planning of shifting the access paths, need to erect of barriers, location of labour huts, parking and material stockpiles, etc.	The visual survey has to be carried out collectively by the engineers of the DSC and PIU and the Contractor.	The plans have to be submitted to the hospital authorities for their comments/ approval	No additional costs involved
10	Community and public awareness	Careful planning and extensive coordination with hospital users must be established. Hospital users should be of the period of construction, and changes of the entrance to the hospital, changes of units/venues of the hospital, dangers posed by construction-related activities and how to avoid such incidences, impacts such as dust and noise, etc.	The Contractor has to coordinate this with the hospital authorities.	DSC and Project Engineer, PIU-Uva Province to monitor	No additional costs involved
Construction Phase					
1	Impacts due to site preparation activities, clearing of vegetation and	• Removal of vegetation on-site should be restricted to the bare minimum, and a strip of vegetation should be left around the disturbed area.	The Contractor	DSC and Project Engineer, PIU-Uva Province to monitor	Cost included in the preliminary works

No	Activity/Env. impact	Mitigation measures	Implementation responsibility	Monitoring responsibility	Indicative cost of mitigation
	ground preparation	• Erosion control during land preparation activities and cutting/filling within the site premises is needed. Rainy periods should be avoided to the extent possible for land clearing. Surface runoff should be diverted away from the site and/or construction site, and drainage should be diverted through silt traps (if needed). Any loose soil within the site should be compacted as soon as possible. • All spoil, topsoil, demolition waste, and cut vegetation should be covered by secure tarpaulins whenever stored on-site and transported offsite, to prevent material being blown away by trucks • Avoid stockpiling any excess spoils at the site for long periods. Such material should be disposed of at approved/designated areas without delay • Prohibit burning of vegetative matter and domestic waste; Ensure that wastes are not haphazardly thrown in and around the site; provide proper collection areas/bins/craters, etc. • Conduct site clearance and restoration to original condition after the completion of construction work before issuing of completion certificate.			
2	Removal of large trees	• Tree barks, stumps and wood debris can be distributed to be used as firewood to local people free of charge. • Trees that are of commercial value should be felled by the Timber Corporation, and the timber should be disposed of according to their instructions. If such trees are being cut, proper consents/approvals need to be obtained from hospital authorities and Divisional Secretariat, as appropriate and inform the Timber Corporation to remove the tree. • Plant at least three trees each to compensate for the loss of each tree. Trees can be planted along the newly built access road and as part of the landscaping of the hospital premises.	Hospital Authority (DMO, MOIC, MO) The Contractor to coordinate this, and all original hard copies of consent letters and other correspondence should be lodged with the hospital authorities for record-keeping.	PIU-Uva Province to monitor	Small budgets needed for the planting of a few trees. The Hospital Authorities should contact local Agrarian Services Office and/or Timber Corporation for plants. Hospital and/or the Contractor can ideally take this up as a CSR project with local sponsorship.

No	Activity/Env. impact	Mitigation measures	Implementation responsibility	Monitoring responsibility	Indicative cost of mitigation
3	Impacts due to the demolition of buildings and other structures	• Prepare and implement a Construction Waste Management Plan (CWMP); include waste minimization measures in the plan • Consult the hospital authorities after careful removal of such reusable/recyclable material and handover to the material stocks to them. It is the responsibility of the Contractor to keep records of such material that are handed over to the hospital authorities. • Reuse as much demolition waste and material as much as possible • Asbestos sheets should be reused, rather than disposing of. Extra care should be exercised in removing and, if need when disposal of asbestos products (See Annex 5: Asbestos Management Plan). • Find alternative beneficial uses for any unused building material, e.g., fills in other construction works; fixtures and fittings to be reused. • There should be no open burning of any demolished material, on-site or offsite. • Workers should be provided with appropriate safety wear, Worker Personal Protective Equipment (PPE) during demolition, and disposal. Control of Noise & Vibration: See #5 Control of Dust and Air Pollution: See #6 Transport-related impacts: See 4	The Contractor	DSC to supervise and keep records and report to Project Engineer, PIU-Uva Province	Covered under the contract budget
4	Impacts on soil due to excavation, transportation and storage of construction material and disposal of spoil and construction debris	• Earth stockpiled on-site should be fully covered on all sides with a suitable material, and weight should be placed at the base to prevent the cover from getting displaced and exposing earth to erosion. They should be stored away from site/road drainage paths. • Drains bringing in stormwater towards the construction area should be prevented with earthen/sandbag berms during wet weather. • On hilly terrain, vulnerable slopes in the disturbed areas should be covered with mulch or plastic sheets fortified with a weight such as sandbags or rocks or a silt fence should be erected at the base	The Contractor	DSC to supervise and keep records and report to Project Engineer, PIU-Uva Province	Covered under the total construction cost.

No	Activity/Env. impact	Mitigation measures	Implementation responsibility	Monitoring responsibility	Indicative cost of mitigation
		of the slope where it tapers to a drain or road. • Construction should be scheduled in a way that earthwork such as excavations is carried out. In contrast, all the preparations for foundation construction and pipe works, septic tank and soakage pit construction are ready to commence immediately after excavations are over. This will allow the backfills to be completed without delay and minimize the need to stockpile the spoil/soil for a longer duration. • Oil and lubricant waste should not be buried or burnt in the project site but collected and stored in proper oil-cans and disposed for reuse or LA approved designated sites. • All other hazardous chemicals such as paint shall be stored in a safe place that is not subjected to floods or accidental spilling. Empty paint cans will be collected and removed to an authorized dumpsite. • Packing material, polyethene, wooden debris (e.g., used for shuttering work), etc. should be appropriately collected, stored and the Contractor should remove them from the site before handing over. • Water collection basins and sediment traps shall be installed in areas where construction machinery/equipment (concrete mixers, buckets, containers and cans, paintbrushes) must be washed daily.			
5	Impacts due to activities creating noise and vibration	• Construction work within the site, vehicles and equipment used in construction work should meet CEA standards for noise and vibration in Sri Lanka (see Annex 8). • High noise-generating activities should be scheduled after informing and with the consent of the hospital authorities. • Noise barriers must be erected, if needed, to cut down high noise. However, the Contractor can separate the site premises with a delineated	The Contractor The height of the noise barrier, material (e.g., zinc-aluminium sheets, plywood sheets, tarpaulin, etc.) to be used for the barrier and the locations to erect such barriers have to be decided in consultation	DSC to supervise and keep records and report to Project Engineer, PIU-Uva Province	This item has already been absorbed into the total construction cost. Rs. 10,000–25,000 for the crack survey (if needed) It is the Contractor's

No	Activity/Env. impact	Mitigation measures	Implementation responsibility	Monitoring responsibility	Indicative cost of mitigation
		barrier with the dual function of dust/noise containment and safety. • Use of noisy machines should be restricted and where possible noise-reducing means for construction machines should be used. • Construction activity should be between 8.00 am to 6.00 pm daily to avoid discomfort caused by noise and vibration that for in-patients and neighbourhood. • If certain nighttime construction activities are unavoidable, it should be done using noise-reducing means or low-noise technologies. • Noisy construction machines/ activities should be scheduled to coincide with non-clinic and non-OPD days/times as much as possible or on days that patient visitation to the facility is minimum. • Liaising with the hospital authorities of the work schedules is always advisable. Prior notices of noise generating activities will avoid confusions of among hospital authorities and the Contractor • Conformity to the Interim Standard on Vibration Pollution Control for Sri Lanka is needed (see Appendix 8). • If vibration causes structural damages to nearby structures, the Contractor is liable to rectify such damages.	with the hospital authorities under the instructions of the DSC. A prior crack survey has to be carried out as a precautionary measure so that both the Contractor and the hospital authorities can resolve issues (if any) that may arise in an unlikely case.		liability to cover any damages to third party property during construction.
6	Impacts due to activities creating emissions and impacts on air quality	• Effective dust barriers have to be erected to prevent dust being blown towards other parts of the hospital (as mentioned above this barrier can function as noise/dust containment as well as for fencing the site premises that is used for safety reasons). • The louvres/pergolas of nearby buildings must be temporarily covered with polythene sheets until the construction work is over. • The site should be cleaned daily, especially surfaces that are affected by soil and dust. • Regular watering (at least twice a day during the	The Contractor The height of the noise barrier, material (e.g., zinc-aluminium sheets, plywood sheets, tarpaulin, etc.) to be used for the barrier and the locations have to be decided in consultation with the hospital authorities under the instructions of the DSC.	DSC to supervise and keep records and report to Project Engineer, PIU-Uva Province	This is part of the total construction cost.

No	Activity/Env. impact	Mitigation measures	Implementation responsibility	Monitoring responsibility	Indicative cost of mitigation
		mid-morning and mid-evening) should be carried out in the construction site for dust suppression. • Excavated soil that is temporarily stored on-site should be covered in a tarpaulin or other locally sourced suitable material to prevent from dust particles getting air-borne. • Where possible, construction stockpiles and debris piles should be stored away from the functional areas of the hospital. • During transportation trucks carrying earth, spoil (if any) or construction material to and from the sites should be covered by a tarpaulin. • Any equipment and machinery which uses diesel shall be appropriately maintained, to control emissions. The Contractor has to ensure that vehicles entering the site have obtained Vehicle Emission Certificates (VEC).			
7	Impacts due to activities that affect surface and groundwater quality and quantity	• Maintain cross drainage within the site always during construction. Hence stockpiles and debris must be safely stored away from these drainage paths. • Where blockage of drainage is unavoidable, alternative paths must be created to facilitate stormwater flows from the site to outside. • Lead away drains that collect water from the internal drainage system of the nearby buildings must be kept clean and free from any constrictions to ensure a smooth flow of stormwater. • The construction site/s should be checked daily (after wet weather) for any signs of water stagnation and cleaned. • A washing area for construction equipment should be delineated within hospital premises away from the construction area • Wastewater from the construction site should not be directly discharged into roadside drains. It should be first directed to a pit to allow siltation and	The Contractor	DSC to supervise and keep records and report to Project Engineer, PIU-Uva Province	This is part of the total construction cost.

No	Activity/Env. impact	Mitigation measures	Implementation responsibility	Monitoring responsibility	Indicative cost of mitigation
		percolation before connecting to a lead away drain. • Temporary toilets should not be located close to shallow wells. Wastewater should be disposed of on-site by way of having an appropriate collection and disposal system (e.g., pit latrines, or septic tanks with soakage gullies/pits, etc.). • The workers may use existing toilets in the hospital premises, with the consent of the hospital authorities. Such use of toilets should not affect other users of the hospital in any way. Also, it has to make sure that such use of toilets will not affect the health of the workers, as the toilets may be used by patients, thereby exposing workers to undue health risks.			
8	Impacts due to extraction of water for construction purposes	Availability of water for construction purposes will have to be assessed in a site-specific manner. However, where water supply is limited, the Contractor should arrange his own supply for construction activities to avoid potential conflicts. If the Contractor uses water supplies available at the hospital, necessary approvals shall be obtained from the hospital authority or the water supply provider, as required.	Contractor to seek approval from relevant authorities and secure water supplies	DSC to approve and keep records and report Project Engineer, PIU-Uva Province	Water usage by the Contractor has to be priced, and the cost of the supply has to be claimed. DSC and the PIU have to check this prior to payment of any claims of the Contractor.
9	Impacts due to solid waste generation, collection, and disposal	• Solid waste should never be burnt in the open (on-site or elsewhere) • Waste separation within the site premises in colour-coded bins. The bins should be tightly closed to prevent vermin and pest infestation • Hand over the collected waste to the local authority. • The Contractor should make the workers aware of waste management practices and oversee compliance to such practices, and maintaining a good communication system with the local authority • Maintaining the waste storage spaces clean • Once the biodegradable waste and mixed waste is handed over to the local authority, sell the	The Contractor	DSC to supervise and keep records and report to Project Engineer, PIU-Uva Province Hospital Authorities to monitor	No additional costs involved. Any costs in the collection, disposal and transportation should be borne by the Contractor.

No	Activity/Env. impact	Mitigation measures	Implementation responsibility	Monitoring responsibility	Indicative cost of mitigation
		recyclable waste (if any) to selected collectors registered with the CEA in the area Note: For construction waste management: refer #3 above mitigation of impacts due to the demolition of buildings and other structures			
10	Impacts due to migrant labourers and operation of labour camps	• If there is a need to establish labour camps, they should be established in suitable locations away from the hospital's functional areas with the consent from the hospital management. • The labourers should be instructed to behave decently without creating disturbances to hospital users and others in the neighbourhood. • Local labour should be recruited as much as possible to minimize social consequences of migrant labour and to provide livelihood opportunities to the local community. • Labourers/workers should be provided with adequate sanitation facilities and receptacles for garbage collection. • Domestic solid waste collected should be disposed of daily at a site given to them. • Burying and burning domestic waste in the project sites should also be strictly avoided • A good supply of drinking water should be provided to the labour camps.	The Contractor	DSC to supervise and keep records and report to Project Engineer, PIU-Uva Province	No additional costs involved. This is part of the total construction cost.
11	Impacts due to occupational health and safety	• A safe construction site should include: (i) fully functional and well-maintained equipment, (ii) availability of emergency equipment and safety warnings, and, (iii) worker personal protective equipment (PPE) and a strong commitment to follow safety practices with proper supervision of labour with proper monitoring and feedback • Workers must be provided with first-aid and health facilities. First aid training should be provided to the supervisor. • The constructors should carry out suitable training programs on occupational health and safety for	The Contractor The Contractor should pay attention to and prepare a safety plan to address 'emerging concerns on the safety of workers to prevent spreading of COVID-19': This safety plan should consist of the information as proposed in Annex 9.	Hospital authorities and PHI (MOH) to check the Safety Plan and comment and advice. DSC to monitor implementation of the provisions of the safety plan and report to PIU.	The cost is included in total construction cost. Allow for Contractor's liability insurance for workers' health and safety and third party injuries and damages.

No	Activity/Env. impact	Mitigation measures	Implementation responsibility	Monitoring responsibility	Indicative cost of mitigation
		workers • Machinery and equipment that could easily electrocute should be kept safely within the site and always under the supervision of an experienced worker. Arranging regular safety checks for vehicles and equipment is needed, including the labour huts. • Allocation of responsibility to the relevant personnel is needed. Prohibition of alcohol and other narcotic substances which may impair the judgment of workers engaged in construction activities, should be enforced. • Excavated areas for construction should be barricaded using barricading tapes and signboards. When work is done at higher elevations; the work should be carried out and supervised by experienced workers.			
12	Impacts on public health and safety	• The construction site should be delineated from the rest of the hospital, preferably using barricading tape or any other suitable material that separates the construction area from the rest of the hospital physically. • A safe pedestrian pathway to the hospital buildings should be provided if regular access along with the nearby gate and the hospital access road is blocked. • Signboards and directions for such detouring and shifting of facilities should be placed in all the two local languages, at prominent locations and in large-sized lettering. Safety of the peripheral areas of the site and access paths should be ensured at all times, e.g., non-slippery surfaces, clear of any obstructions and dangers, maintaining a clean, tidy, and well-managed sites and activities, etc. • Safety signs should be placed at appropriate locations, informing the public of any dangers posed by construction-related activities. • Emergency access should never be obstructed. Alternative access for the ambulance and	The Contractor	Hospital authorities and PHI (MOH) to check the provisions of the Contractor to ensure publish health and safety, and comment and advice. DSC to monitor implementation of the public health and safety provisions report to PIU.	This is part of the total construction cost. Allow for Contractor's liability insurance for public health and safety and third party injuries and damages.

No	Activity/Env. impact	Mitigation measures	Implementation responsibility	Monitoring responsibility	Indicative cost of mitigation
		vehicular access should be provided whenever needed. • Strict entry controls to the site premises should be in place so that unauthorized entry is debarred. • Notices should be provided to hospital staff and users about the schedule of construction activities with particular hazards, and potential noise and dust episodes, etc. • Concrete mixer trucks or any other trucks/construction vehicles should not be parked outside the hospital premises, as the access roads are either narrow or busy. • Advance public notices should be displayed so that the hospital users are informed of the tree cutting. • All slopes should be strengthened by appropriate engineering interventions. Access roads and access paths should be rehabilitated to their original conditions.			
13	Site restoration (at the end of construction) and landscaping	• Provide proper rainwater drainage network to the areas peripheral the site, which will also prevent local flooding of low-elevation areas of the hospital premises, avoid soil erosion in the sloping terrain. • Any lead away drains, roof gutters and downpipes of other buildings, if damaged or altered during construction, should be restored. • Rehabilitation of the areas used for labour huts, offices, water storage tanks, material storage yards, temporary drains, toilets, etc. • Turfing any exposed ground area, especially sloping terrain to avoid soil erosion and landscaping with suitable trees (see #2 of this list). This will prevent soil erosion of the peripheral areas of the sub-project.	The Contractor	Hospital authorities to check and report to PIU DSC to supervise and report to Project Engineer, PIU-Uva Province	This is part of the total construction cost.
14	Impacts on biological resources	No impacts are envisaged other than the removal of three trees. Planting of trees as specified above – See # 2	See #. 2 of this list.		

No	Activity/Env. impact	Mitigation measures	Implementation responsibility	Monitoring responsibility	Indicative cost of mitigation
15	Impacts on the Cultural and historical environment	All the staff and labourers of the Contractor should be informed about the possible items of historical or archaeological value, which include old stone foundations, tools, clayware, etc. If something of this nature is uncovered, Department of Archaeology shall be contacted, and work shall be stopped immediately. The chance find the procedure of archaeological and cultural artefacts are described in Chapter VI.	If instructed by the Department of Archaeology (DOA), the Contractor should undertake reconnaissance surveys with the DOA to identify any archaeological/historical weak structures (if any) that are likely to damage from high ground vibration levels during excavation work.	DSC and PIU to follow up with the Department of Archaeology	Additional costs to be ascertained on a case-by-case basis (only if such instances arise)
Operational Stage					
1	Impacts of improper handling and disposal of healthcare waste: Increased generation of hazardous health care waste which is improperly disposed of can put public health at risk from accidental infections and contaminate the natural environment.	Infectious waste should be collected separately and autoclaved at the point of generation. Once disinfected, the waste would leave a medical area in the infectious healthcare waste container. Containers for infectious waste should not be placed in public areas. Waste bins should be located as close as possible to sinks and washing facilities. Containers should be of similar size to overcome the observed tendency for staff to put waste in the largest receptacle. Where possible, hazardous waste generated in medical areas should be stored in utility rooms, which are designated for cleaning equipment, dirty linen, and waste.	DSC for designs The Contractor for the construction	Hospital authorities and PHI of the relevant MOH area to check PIU and RDHS to follow up	Costs for designs and construction involving the project components proposed by the HSEP are part of the total design and construction costs. Subsequent operations and maintenance is part of the recurrent cost of running the HFC.
2	Possible contamination of infections by health care staff	• Ensure yellow bags are correctly closed and tied with an overhand balloon knot so that they are leak-proof before being moved. • Yellow bags should be placed in a container with a secure lid. • All sharps containers should be fully closed and placed in a bag and then in a container. Preferably,	DSC for designs The Contractor for the construction	Hospital authorities and PHI of the relevant MOH area to check Hospital authorities and PHI of the relevant	Costs for designs and construction involving the project components proposed by the HSEP are part of the total design and construction costs.

No	Activity/Env. impact	Mitigation measures	Implementation responsibility	Monitoring responsibility	Indicative cost of mitigation
		single-use disposable sharps containers should be used in place of reusable sharps containers. • Single-use gloves (nitrile or latex) and gowns should be discarded after each use and not reused • All who handle health care waste should wear appropriate PPE and perform hand hygiene after removing it. • Frequently touched surfaces throughout the reception area should be cleaned regularly. • Bathrooms should be cleaned and disinfected at least once a day. • Well-trained permanent staff are responsible for packaging waste to transport for treatment facilities. • Each bag must be hand-tied by gathering and twisting the neck of the bag and using a tie or hand knot to secure the bag, and each container must be securely closed. • Improperly packaged containers or damaged containers will be denied pick up until packed them properly. • Bins used for disposing of infectious waste must be disinfected before reuse by any means effective for the infectious substance the container previously contained. • Direct contact (without gloves) with bins or bags should be avoided in any case. • Uniforms should be daily changed - cleaning of work clothes and shoes is minimizing the possibility of dispersing the virus in the air – make sure not to shake clothes – wash them at a temperature of at least 60 ° C with conventional detergents, add disinfectants if possible. • Put a disposable set of gloves, on a daily basis, in direct contact with skin, before wearing usual work gloves.		MOH area to check PIU and RDHS to follow up	Subsequent operations and maintenance is part of the recurrent cost of running the HFC.
3	Generation and disposal of wastewater	The wastewater treatment system includes a septic tank and a soakage pit. The septic tank/soakage tank as the wastewater	DSC for designs The Contractor for the	Hospital authorities and PHI of the relevant MOH area to	Costs for designs and construction involving the project

No	Activity/Env. impact	Mitigation measures	Implementation responsibility	Monitoring responsibility	Indicative cost of mitigation
	generated from the newly constructed building	collection and disposal method should be appropriately designed so that no adverse impacts are expected. Desludging should be done as and when needed.	construction	check PIU and RDHS to follow up	components proposed by the HSEP are part of the total design and construction costs. Subsequent operations and maintenance is part of the recurrent cost of running the HFC.
4	Increased generation of sewage and wastewater from the hospital that can contaminate groundwater with disease-causing pathogens, pharmaceutical chemicals, endocrine-disrupting chemicals, etc.	A properly designed septic tank and a soakage pit should be installed. The blackwater should be directed to the septic tank before soakage. All wash water shall be disinfected and aerated first before being sent to the soakage pit. Wastewater from washing hands, cleaning, laundry, bathing, flush toilets, and teeth brushing activities should be safely collected and treated with chlorine before being sent to sewer lines or infiltrated into a soak-away pit.	DSC for designs The Contractor for the construction	Hospital authorities and PHI of the relevant MOH area to check PIU and RDHS to follow up	Costs for designs and construction involving the project components proposed by the HSEP are part of the total design and construction costs. Subsequent operations and maintenance is part of the recurrent cost of running the HFC.
5	Provision of water supply	There should be water storage of which should be sufficient for at least 1½ –2 days). The water quality of supplies should conform to SLS614 (2013): Sri Lanka Standards for Potable Water.	DSC for designs The Contractor for the construction	Project Engineer, PIU-Uva Province Hospital authorities and PHI of the relevant MOH area to check	Costs for designs and construction involving the project components proposed by the HSEP are part of the total design and construction costs. Subsequent operations and maintenance is part of the recurrent cost of running the HFC.
6	Occupational health and safety - Emergency	**(a) Emergencies** The HCF needs to have procedures in place for how staff should deal with accidents and emergencies.	PIU (during commissioning)	Hospital Authority (DMO, MOIC, MO)	Provision of safety equipment is part of the HSEP project cost.

No	Activity/Env. impact	Mitigation measures	Implementation responsibility	Monitoring responsibility	Indicative cost of mitigation
	Response Procedures For comprehensive emergency response procedures, refer to Laboratory quality management system: handbook published by the WHO[1]	Generally written procedures for first aid should be developed and made available to all staff, so they know the first things to do, and who to call or notify in case of minor cuts and bruises, major wounds, or skin contamination. **(b) Chemical spills** A chemical spill is considered to be minor only if the person who spilt it is familiar with the chemical, knows the associated hazards and knows how to clean up the spill safely. The recommended steps for dealing with a minor spill include: • alert coworkers, then clean up the spill • follow procedures for disposal of materials used to clean up the spill • absorb free liquids with an appropriate absorbent, as follows - caustic liquids—use polypropylene pads or diatomaceous earth - oxidizing acids—use diatomaceous earth - mineral acids—use baking soda or polypropylene pads - flammable liquids—use polypropylene pads • neutralize residues and decontaminate the area Anything beyond a minor spill, and that requires help from outside of the laboratory group constitutes a major spill. Steps to deal with major spills include alerting coworkers, moving to a safe location, and calling authorities to report the situation. **(c) Biological spills** When surfaces are contaminated by biological spills, the appropriate actions to take are: 1. Define/isolate the contaminated area 2. Alert coworkers 3. Put on appropriate PPE	Hospital Authorities (DMO, MOIC, MO) (during operations of the laboratory)	(during commissioning) Laboratory-in-charge (during operations of the laboratory)	Provision of consumables to be used in in emergencies is part of the recurrent cost of running the HFC.

[1] ISBN 978 92 4 154827 4 © World Health Organization 2011

No	Activity/Env. impact	Mitigation measures	Implementation responsibility	Monitoring responsibility	Indicative cost of mitigation
		4. Remove glass/lumps with forceps or scoop 5. Apply absorbent towel(s) to the spill; remove bulk and reapply if needed 6. Apply a disinfectant to towel surface 7. Allow adequate contact time (20 minutes) 8. Remove towel, mop-up, and clean the surface with alcohol or soap and water 9. Properly dispose of materials 10. Notify the supervisor, safety officer, and other appropriate authorities. Disinfectant: For most spills, use a 1:50 solution (1 g/l chlorine) of household bleach (sodium hypochlorite solution containing 50 g/l chlorine). For spills containing large amounts of organic material, use a 1:10 solution (5 g/l chlorine) of household bleach, or an approved mycobactericidal[2] Alcohols are not recommended as surface decontaminating agents because they evaporate quickly, thus decreasing contact time. If laboratory personnel become contaminated with biological hazards due to splashes or spills, immediate steps to take include: 1. Clean exposed skin or body surface with soap and water, eyewash (for eye exposures) or saline (for mouth exposures). 2. Apply first aid and treat as an emergency. 3. Notify supervisor, safety officer, or security desk (after hours). 4. Follow appropriate reporting procedures. 5. Report to the physician for treatment or counselling. **(d) Laboratory fires** Laboratory personnel need to be alert for conditions that might pose a risk for fires. Keep in mind that liquids with low flash points may ignite if they are			

[2] See World Health Organization. Laboratory biosafety manual, 3rd ed. Geneva, WHO, 2004

No	Activity/Env. impact	Mitigation measures	Implementation responsibility	Monitoring responsibility	Indicative cost of mitigation
		near heat sources such as hotplates, or equipment that might produce a spark or heat. A small laboratory fire is considered to be one that is extinguishable within 1–2 minutes. The appropriate action to take is to cover the fire with an inverted beaker or wet paper towels. If this fails, use a fire extinguisher. For large fires, call the appropriate local authorities, usually the fire department and the police department. The laboratory should have the appropriate class of extinguisher for the fire hazards in the laboratory. In general, a class BC or class ABC extinguisher is appropriate. Fire extinguishers must be inspected annually and replaced as needed. Laboratory personnel should be trained in the various classes of fires and basic fire extinguisher use in annual laboratory safety and hazardous waste management training. All laboratory personnel must learn how to operate a portable fire extinguisher. **(e) General safety** Ensure that HCF staff do not have common pathways. This may be needed to prevent or reduce risks of cross-contamination, follow the path of the sample as it moves through the laboratory during the pre-examination, examination, and post-examination phases of testing. The design of laboratory work areas should ensure proper ventilation and surfaces that can be cleaned and disinfected. In establishing a safety management programme, it is essential to appoint a responsible supervisor. The lab should have a safety manual that establishes policy and describes standard procedures for handling safety and emergency issues. Personnel need to be trained in how to apply safety practices and techniques and to be aware of potential hazards			
7	Impairment of surface drainage	Construction of a stormwater drainage management system is needed for some of the	Hospital Authority (DMO, MOIC, MO)	RDHS	This item is not part of the sub-project.

No	Activity/Env. impact	Mitigation measures	Implementation responsibility	Monitoring responsibility	Indicative cost of mitigation
		hospitals.			
8	Soil erosion	The areas peripheral to the new buildings need turfing to prevent soil erosion.	Hospital Authority (DMO, MOIC, MO)	RDHS	This item is not part of the sub-project.
9	Breakdown of power, water, and telecommunication facilities	The newly constructed buildings should be supplied by a dedicated electricity connection, water supplies and telecommunication facilities by the HCF. The HCF should have contingency measures to endure the uninterrupted supply of such facilities.	Hospital Authority (DMO, MOIC, MO)	RDHS	This item is not part of the sub-project.

Annex 4: Environmental Monitoring Plan

Impact/mitigation	Parameters to be monitored	Location	Measurement	Frequency	Monitoring Responsibility and sources of funds
Pre-construction and Construction Stage					
Minimize the need to remove large mature trees	Final layout plan Number of trees that need removal	Site premises	Number of large trees that need removal	Once after designs are completed	DSC to report to PIU Costs covered under design cost
Soil erosion control during excavation and construction	Final layout plan	Construction area Material stockpiles	Check design layouts Inspection of the site for the adequacy of soil erosion control measures, possibility of soil erosion	Once after designs are completed	The Contractor's liability to implement DSC to monitor and report to PIU
	Soil washed away with surface runoff		Visual observation	Daily	The Contractor's liability to implement DSC to monitor and report to PIU Costs covered under construction cost
Air-borne particulate matter and air quality deterioration due to excavation, construction work, stockpiling, and movement of heavy vehicles	Air-borne particle in the air Dust collected at the windowsills of the nearby buildings	Construction site Nearby buildings	Visual observation of dust in the air Feedback from hospital authorities	Daily - Continuous Weekly	The Contractor's liability to implement DSC to monitor and report to PIU Costs covered under construction cost

Impact/mitigation	Parameters to be monitored	Location	Measurement	Frequency	Monitoring Responsibility and sources of funds
Controlling noise and vibration levels due to excavation, construction work and movement of heavy vehicles	Noise and vibration levels		Qualitative observation of Noise/Vibration level Feedback from hospital authorities	Daily - Continuous Weekly	The Contractor's liability to implement DSC to monitor and report to PIU Costs covered under construction cost
Containment of contamination	Storage of potential contaminants and any spills	Storage areas	Inspection of the site for the adequacy of contamination control measures, the possibility of contamination	Daily	The Contractor's liability to implement DSC to monitor and report to PIU Costs covered under construction cost
Proper disposal of construction waste (non-hazardous)	Collection, storage and disposal of non-hazardous waste	Construction site, areas of waste storage	Inspection of the site for availability of waste collection bins, records of waste removed from the site, an inspection of disposal sites Events of open burning of waste	Daily	The Contractor's liability to implement DSC to monitor and report to PIU Costs covered under construction cost
Control of on-site drainage impairment	Surface Runoff patterns	Site premises and the peripheral areas	Visual observation and inspection of the site for stagnant water; blocked drains etc.	Daily	The Contractor's liability to implement DSC to monitor and report to PIU Costs covered under construction cost

Impact/mitigation	Parameters to be monitored	Location	Measurement	Frequency	Monitoring Responsibility and sources of funds
Containment of construction wastewater discharge	Discharge of construction wastewater	Site premises	Visual observation and inspection of the site for the open discharge of wastewater and pollution	Daily	The Contractor's liability to implement DSC to monitor and report to PIU Costs covered under construction cost
Pollution from labour camps	Waste and wastewater generated due to labour gangs at site	Site premises	Visual observation and inspection of the activities of labour gangs, feedback from construction workers	Daily	The Contractor's liability to implement DSC to monitor and report to PHI (MOH) and PIU Costs covered under construction cost
Occupational health and safety issues	Records of accidents	Site premises	Visual inspection of the site, adequacy of signage and delineation barriers, number of accidents and complaints registered in the GRM	Daily	The Contractor's liability to implement DSC to monitor and report to PHI (MOH) and PIU Costs covered under construction cost
Complaints registered in the Grievances Redress Mechanism	Records of complaints		Nature of complaint and providing a proper solution	Continuous	PIU and Grievance Redress Committee of PIU, Uva Province No additions funds are needed.

Impact/mitigation	Parameters to be monitored	Location	Measurement	Frequency	Monitoring Responsibility and sources of funds
Operational stage Note: Costs involved in environmental monitoring during the operations stage is part of the recurrent cost of running the HFC.					
Proper collection and disposal of wastewater	Leaking drains and pipelines, overflowing of drains and septic tank	Locations where such wastewater is generated, collected, treated, and disposed of.	Any signs of leaking drains and pipelines, overflowing of drains and septic tank	Daily	Hospital authorities to monitor and PHI of the relevant MOH area to check
	Microorganisms and chemical presence	Monitoring tube well located at 20–25 m away from the soakage pit	Test the groundwater samples collected using the monitoring tube well	Semi-annual	Hospital authorities to monitor and PHI of the relevant MOH area to check
Proper collection, storage, and disposal of healthcare waste (hazardous)	Method of collection, sorting, storage, and disposal of HCW	Locations where such waste is generated, collected, treated, and disposed of.	Inappropriate methods or lapses in methods collection, sorting, storage, and disposal of HCW	Daily	Laboratory staff and hospital authorities to monitor and PHI of the relevant MOH area to check
Soil erosion control during excavation and construction	Soil washed away with surface runoff	Peripheral areas of the HCF	Visual observation Check for the adequacy of soil erosion control measures, possibility of soil erosion	Continuous	Officer responsible for maintenance of the HCF
Control of on-site drainage impairment	Surface Runoff patterns	Site premises and the peripheral areas	Visual observation and inspection of the site for stagnant water, local flooding, blocked drains etc.	Continuous	Officer responsible for maintenance of the HCF
Occupational Health and Safety Issues	• Emergency procedures • Events of chemical spills • Events of biological spills • Events of laboratory fires	HCF premises Washrooms, waste storage areas and peripheral areas of the lab.	Regular review of emergency preparedness procedures Regular review of emergency response procedures	Continuous	Staff who is in-charge of safety H&S Committee of the HCF

Impact/mitigation	Parameters to be monitored	Location	Measurement	Frequency	Monitoring Responsibility and sources of funds
	• General safety issues, including ventilation and tidiness		Regular review of emergency events, log entries, and safety logs and reports Stocks of consumables needed to be used during emergencies and spill events, firefighting equipment, etc., checks for their expiry dates Indoor air quality Quality control procedures as outlined in Standard Practices[3]		

[3] Laboratory quality management system: handbook published by the WHO, ISBN 978 92 4 154827 4 © World Health Organization 2011

ANNEX 5: Guidelines for removing asbestos cement (AC) sheets from buildings

Background: Asbestos cement sheets are still widely used as roofing material in Sri Lanka, which accounts for most of asbestos use in the country. While many countries have banned the use of all forms of asbestos, Sri Lanka has not yet imposed a total ban although many policy level discussions are going on in assessing this risk and identifying how to address it.

In AC, the chrysotile (or white asbestos) fiber is encapsulated in a cement matrix. While this fiber-cement bond is regarded to be relatively safe, if it is released into the air during (I) assembling, cutting, removing asbestos sheets during construction and (ii) aging and fungal attacks on AC sheets or (ii) the process of aging and fungal attack, and is inhaled over a long period of time, it can cause great risks to public health. The Rotterdam Convention of Hazardous chemicals lists asbestos containing material as hazardous that requires to follow a prior informed consent procedure in importation etc. The National Environmental Act of Sri Lanka identifies 'waste arising from repairing/renovation processes and demolition/construction debris containing asbestos' as a scheduled waste in Part II (specific sources) requiring licensed approval for disposal.

Under HSEP, renovation of PHC facilities that will generate AC sheets will not be disposed of in an irresponsible way. The following note is a further guide to the provisions contained in the EMP for the safe handling and disposal of used AC sheets.

Some images of PHC facilities in the current package using AC sheets (Hambegama DH, Ettampitiya DH, Meegahakiwula DH)

The following guidelines have been extracted from Health and Safety Executive (http://www.hse.gov.uk/) - an independent regulator for safe working environments in the UK.

<u>Preparing the work area</u>

- Ensure safe access to the roof. If necessary, use a mobile access platform.
- Restrict access to the working area to minimize the number of people present. This is extremely important as the construction sites are sensitive receptors constantly used by those who are sick.
- Delineate the area using tape and notices to warn others.
- Ensure adequate lighting.

Equipment needed

- Thick polythene sheeting and duct tape
- Barricade tape and warning signs
- Bolt cutter
- Straps and ropes
- Water sprayer
- Buckets of water and rags
- Sealable bags for large AC pieces broken away from the roof
- Personal protective equipment such as masks, overalls, gloves and boots

Guidelines during removal

- Avoid or minimize breaking the AC.
- If fasteners hold the sheets in place, dampen and remove them and place them in the asbestos waste bag.
- If the sheets are bolted in place, dampen, and cut the bolts while avoiding contact with the AC.
- Remove the bolts or fixings carefully and place them in the asbestos waste bag.
- Unbolt, or use cutters to release gutters, drainpipes, ridge caps etc. Avoid contact with the AC.
- Lower large pieces to the ground. Do not drop them or use rubble chutes. Stack sheets carefully.
- Where there are several AC sheets and other large items, place them in a lockable skip.
- Double-wrap large pieces in 1000-gauge polythene sheeting. Seal with duct tape.
- Attach asbestos warning stickers.
- Place small pieces in the asbestos waste bag.

Guidelines for cleaning and disposal

- Clean the equipment and the area with damp rags.
- Check for debris in fasteners or bolt holes. Clean with damp rags.
- Put debris, used rags, polythene sheeting and other waste in the asbestos waste bag and tape it closed.
- Dispose of contaminated webbing and rope as ‘asbestos waste’.
- Put the asbestos waste bag in a clear polythene bag and tape it closed.
- For disposal of the discarded AC sheets.
    - Store the sealed asbestos sheets in a safe corner of the hospital premises or transport to a central disposal yard where waste from all sites in the district can be stored.
    - Transfer to the sanitary landfill at Aruwakkalu which will be ready for operation in the near future

1 – Safe wrapping of removed asbestos in thick polythene
2 – Construction workers wearing full PPE
3 – Asbestos bags
4 – Walking on AC sheets can crack them and release fiber into the air. Here they use plans to walk on
5 – Using a mobile platform to remove the sheets minimizing the risk of breaking up AC sheets

ANNEX 6a: CURRENT PRACTICES IN HANDLING AND DISPOSING HEALTHCARE WASTE IN MONARAGALA DISTRICT

Description		Medagama	Kotagama	Rathmalgaha Ella	Pitakumbura	Nannapurawa
Hospital Type		DH (B)	PMCU	PMCU	DH (C)	PMCU
Beds (occupancy)		77 (19%)	-	-	16 (25%)	-
Average outpatients per day		200 -250 a day	70–100	35	30–40	80–120
Number of Staff		Doctors: 5 Nurses: 17 Other staff: 4 SKS and minor staff: 21	Doctors: 1 Nurses: - Other staff: 1 SKS and minor staff: 2	Doctors:1 Nurses: - Paramedic staff: 1 SKSs and Minor staff: 2	Doctors:2 Nurses: 2 Paramedic staff: 1 SKSs and Minor staff: 9	Doctors: 1 Nurses: - Other staff: 1 SKS and minor staff: 2
Units		Five medical wards, Outpatients' Department (OPD), Emergency Treatment Unit (ETU), Lab, drug stores and dispensary, labor room, mortuary, dental clinic	OPD, ETU, drug stores and dispensary, clinics		Three medical wards, Outpatients' Department (OPD), Emergency Treatment Unit (ETU), Lab, drug stores and dispensary, labor room, mortuary, dental clinic	OPD, ETU, drug stores and dispensary, clinics
HWCM Plan		No	No	No	Yes	No
Environmental Protection License		Yes	No	-	Yes	No
Available equipment and facilities for HCW Management		Autoclave (not in use)	Autoclave (not in use)	None	None	Autoclave (not functioning)
Human anatomical waste ((human body parts, tissues, organs etc.)	Waste generation point	Medical wards, ETU, OPD, Dental clinic, labor room	-	Medical wards, ETU, OPD, Dental clinic, labor room	Medical wards, ETU, OPD, Dental clinic, labor room	-
	Quantity of waste (/day)	2–3 kg	-	750 g	750 g	-
	Segregation of waste	Yes	-	Yes	Yes	-
	Present treatment method	Placenta: open burning	-	Open burning	Open burning	-

Description		Medagama	Kotagama	Rathmalgaha Ella	Pitakumbura	Nannapurawa
Infectious waste ((body fluids, fecal matter, urine, sputum, blood, etc.)	Waste generation point	Medical wards, ETU, OPD, Dental clinic, labor room	ETU, OPD, Clinics	Medical wards, ETU, OPD, Dental clinic, labor room	Medical wards, ETU, OPD, Dental clinic, labor room	ETU, OPD, Clinics
	Quantity of waste (/day)	5–8 kg	Small amounts	500 g	500 g	Small amounts
	Segregation of waste	Yes	Yes	Yes	Yes	Yes
	Present treatment method	Open burning	Open burning	Open burning	Open burning	Open burning
Chemical waste	Waste generation point	Laboratory, Dispensary	Laboratory, Dispensary	Laboratory, Dispensary	Laboratory, Dispensary	Laboratory, Dispensary
	Quantity of waste (/day)	250 g	Small amounts	50 g	50 g	Small amounts
	Segregation of waste	Yes	Yes	Yes	Yes	Yes
	Present treatment method	Burying	Burying	Burying	Burying	Burying
Pharmaceutical waste	Waste generation point	Pharmacy and dispensary, wards, OPD	Laboratory, Dispensary	Pharmacy and dispensary, wards, OPD	Pharmacy and dispensary, wards, OPD	Laboratory, Dispensary
	Quantity of waste (/day)	250–500 g	Small amounts	250–1,000 g	50–100 g	500 g
	Segregation of waste	Yes	Yes	Yes	Yes	Yes
	Present treatment method	Open burning or burying	Open burning or burying	Open burning or burying	Open burning or burying	Open burning or burying
Sharps	Waste generation point	Dressing room, Vaccination	Dressing room, Vaccination	Dressing room, Vaccination	Dressing room, Vaccination	Dressing room, Vaccination
	Quantity of waste (/day)	-	-	-	-	300 g
	Segregation of waste	Yes	Yes	Yes	Yes	Yes

Description		Medagama	Kotagama	Rathmalgaha Ella	Pitakumbura	Nannapurawa
	Present treatment method	Collected on-site or handed over to the MOH	Handed over to the MOH	Collected on-site or handed over to the MOH	Collected on-site or handed over to the MOH	Handed over to the MOH
Radioactive waste	Waste generation point	-	-	-	-	-
	Quantity of waste (/day)	-	-	-	-	-
	Segregation of waste	-	-	-	-	-
	Present treatment method	-	-	-	-	-
Electronic/Mercury waste	Waste generation point	-	-	-	-	-
	Quantity of waste (/day)	-	-	-	-	-
	Segregation of waste	-	-	-	-	-
	Present treatment method	-	-	-	-	-
Clinical wastewater	Wastewater generation point	Laboratory, wards, clinics, ETU, OPD, staff rest rooms	ETU, OPD, staff rest rooms	Laboratory, wards, clinics, ETU, OPD, staff rest rooms	Laboratory, wards, clinics, ETU, OPD, staff rest rooms	ETU, OPD, staff rest rooms
	Quantity of waste (/day)	-	-	-	-	-
	Segregation of waste	-	-	-	-	-
	Present treatment method	Soakage pit	Soakage pit	Soakage pit	Soakage pit	Soakage pit
Color coded containers		Bins, Bags, Boxes, Trolleys, Wheelbarrows	Bins, Bags	Bins, Bags used but limited	Bins, Bags, Boxes	Bins, Boxes
Are waste handlers provided with adequate personal protective equipment (PPE)		Masks, Boots, Gloves, Aprons	Masks, Gloves, Aprons	Masks, Gloves	Masks, Boots, Gloves, Aprons	Masks, Gloves, Aprons

Description	Medagama	Kotagama	Rathmalgaha Ella	Pitakumbura	Nannapurawa
Waste storage space	Storage room	One small room	No storage space	Storage room	No storage space
Waste transport (on-site)	By hand	By hand	By hand	By hand	By hand
Availability of on-site dump sites	Yes, unlined burial pit	Yes, unlined burial pit	Yes, unlined burial pit	Yes, unlined burial pit	Yes, unlined burial pit
Waste transport (off-site)	No	No	No	No	No
Frequency of removal of HCW	Twice a week	Once a week	Once a week	Daily	Daily
Nearest available HCW treatment equipment available	Bibile Hospital which has an incinerator and metamizer Distance - 13 km	Bibile Hospital which has an incinerator and metamizer Distance - 6 km	Bibile Hospital which has an incinerator and metamizer Distance - 8 km	Bibile Hospital which has an incinerator and metamizer Distance - 13 km	Bibile Hospital which has an incinerator and metamizer Distance - 7 km
Is there a designated person (s) responsible for organization and management of waste collection, handling, storage, and disposal at the hospital administration level?	Yes, responsibilities assigned to one nursing officer and an overseer, an SKS and a janitor	Staff responsibilities not designated, however, hospital staff (SKSs) share the work	Two SKSs are expected to take turns	Yes, Female Sanitary Laborer to clean female toilets/drainage area/sinks , Male sanitary Laborer to clean male toilets/drainage area/sinks, Ordinary laborer to sweeps and clean other areas, SKS to clean wards/ ETU/OPD	SKS staff
Does the waste management staff have job descriptions detailing their tasks?	Yes		No	No	No
Has he/she received any training on hospital waste management?	No	No	No	No	No
Are there clearly defined procedures for collection and handling of wastes from specified units in the hospital?	No	No	No	No	No

Description	Medagama	Kotagama	Rathmalgaha Ella	Pitakumbura	Nannapurawa
Additional Remarks (if any)	Burner for Sharps has to be repaired. An autoclave is available but not in use Awareness programme about HCW management is requested as a matter of priority Bins for separate collection is not sufficient		-	Need a suitable method for sharp waste management Need a proper infectious waste management system, protective clothes boots/aprons, etc.	Some of the HCW is handed over to the local authority together with other uncontaminated solid waste

ANNEX 6b: CURRENT PRACTICES IN HANDLING AND DISPOSING HEALTHCARE WASTE IN MONARAGALA DISTRICT

Description		Haputale	Uva Paranagama	Metigahatenna	Lunugala	Carklees
Hospital Type		DH (B)	DH (B)	DH (B)	DH (B)	DH (C)
Beds (occupancy)		55 (32%)	55 (32%)	56 (40%)	157 (49%)	-
Average outpatients per day		200 -250 a day	400–450	70	30–40	120
Number of Staff		Doctors: 6 Nurses: 9 Other staff: 10 SKS and minor staff: 23	Doctors: 5 Nurses: 13 Other staff: 4 SKS and minor staff: 30	Doctors:3 Nurses: 4 Paramedic staff: 4 SKSs and Minor staff: 17	Doctors:4 Nurses: 8 Paramedic staff: 5 SKSs and Minor staff: 21	Doctors: 1 Nurses: - Other staff: 2 SKS and minor staff: 4
Units		Five medical wards, Outpatients' Department (OPD), Emergency Treatment Unit (ETU), Lab, drug stores and dispensary, labor room, mortuary, dental clinic	Five medical wards, Outpatients' Department (OPD), Emergency Treatment Unit (ETU), Lab, drug stores and dispensary, labor room, mortuary, dental clinic	Five medical wards, Outpatients' Department (OPD), Emergency Treatment Unit (ETU), Lab, drug stores and dispensary, labor room, mortuary, dental clinic	Five medical wards, Outpatients' Department (OPD), Emergency Treatment Unit (ETU), Lab, drug stores and dispensary, labor room, mortuary, dental clinic	OPD, ETU, drug stores and dispensary, clinics
HWCM Plan		No	No	No	Yes	No
Environmental Protection License		Yes	No	-	Application submitted	No
Available equipment and facilities for HCW Management		None	Autoclave	Autoclave	Auto clave, steam sterilizer,	Autoclave
Human anatomical waste ((human body parts, tissues, organs etc.)	Waste generation point	Medical wards, ETU, OPD, Dental clinic, labor room	Medical wards, ETU, OPD, Dental clinic, labor room	Medical wards, ETU, OPD, Dental clinic, labor room	Medical wards, ETU, OPD, Dental clinic, labor room	-
	Quantity of waste (/day)	5 kg	5 kg	3 kg	6 kg	-
	Segregation of waste	Yes	Yes	Yes	Yes	-
	Present treatment method	Placenta: open burning	Open burning	Open burning	Open burning	-

Description		Haputale	Uva Paranagama	Metigahatenna	Lunugala	Carklees
Infectious waste ((body fluids, fecal matter, urine, sputum, blood, etc.)	Waste generation point	Medical wards, ETU, OPD, Dental clinic, labor room	ETU, OPD, Clinics	Medical wards, ETU, OPD, Dental clinic, labor room	Medical wards, ETU, OPD, Dental clinic, labor room	ETU, OPD, Clinics
	Quantity of waste (/day)	5–8 kg	5 kg	3 kg g	6 kg	Small amounts
	Segregation of waste	Yes	Yes	Yes	Yes	Yes
	Present treatment method	Open burning	Open burning	Open burning	Open burning	Open burning
Chemical waste	Waste generation point	Laboratory, Dispensary	Laboratory, Dispensary	Laboratory, Dispensary	Laboratory, Dispensary	Laboratory, Dispensary
	Quantity of waste (/day)	500 g	1 kg	Small quantities	50 g	Small amounts
	Segregation of waste	Yes	Yes	Yes	Yes	Yes
	Present treatment method	Burying	Burying/Burying	Burying	Burying	Burying
Pharmaceutical waste	Waste generation point	Pharmacy and dispensary, wards, OPD	Laboratory, Dispensary	Pharmacy and dispensary, wards, OPD	Pharmacy and dispensary, wards, OPD	Laboratory, Dispensary
	Quantity of waste (/day)	250–500 g	500 g	250 g	500 g	Small amounts
	Segregation of waste	Yes	Yes	Yes	Yes	Yes
	Present treatment method	Open burning or burying	Open burning or burying	Open burning or burying	Open burning or burying	Open burning or burying
Sharps	Waste generation point	Dressing room, Vaccination	Dressing room, Vaccination	Dressing room, Vaccination	Dressing room, Vaccination	Dressing room, Vaccination
	Quantity of waste (/day)	250 g	500 g	250–500 g	2 kg	-
	Segregation of waste	Yes	Yes	Yes	Yes	Yes

Description		Haputale	Uva Paranagama	Metigahatenna	Lunugala	Carklees
	Present treatment method	Collected on-site or handed over to the MOH	Handed over to the MOH	Collected on-site or handed over to the MOH	Collected on-site or handed over to the MOH	Handed over to the MOH
Radioactive waste	Waste generation point	-	-	-	-	-
	Quantity of waste (/day)	-	-	-	-	-
	Segregation of waste	-	-	-	-	-
	Present treatment method	-	-	-	-	-
Electronic/Mercury waste	Waste generation point	Dental	-	-	-	-
	Quantity of waste (/day)	Small quantities	-	-	-	-
	Segregation of waste	Yes	-	-	-	-
	Present treatment method	-	-	-	-	-
Clinical wastewater	Wastewater generation point	Laboratory, wards, clinics, ETU, OPD, staff rest rooms	ETU, OPD, staff rest rooms	Laboratory, wards, clinics, ETU, OPD, staff rest rooms	Laboratory, wards, clinics, ETU, OPD, staff rest rooms	ETU, OPD, staff rest rooms
	Quantity of waste (/day)	-	-	-	10 L	-
	Segregation of waste	-	-	-	-	-
	Present treatment method	Soakage pit	Soakage pit	Soakage pit	Soakage pit	Soakage pit
Color coded containers		Bins, Bags, Boxes, Trolleys, Wheelbarrows	Bins, Boxes	Bins, Boxes	Bins	Bins, Boxes
Are waste handlers provided with adequate personal protective equipment (PPE)		Masks, Boots, Gloves, Aprons	Masks, Gloves	Masks, Gloves	Masks, Gloves	Masks, Gloves, Aprons

Description	Haputale	Uva Paranagama	Metigahatenna	Lunugala	Carklees
Waste storage space	Storage room	One small room	Storage space available	Storage room	No storage space
Waste transport (on-site)	By hand	By hand	By hand	By hand	By hand
Availability of on-site dump sites	Yes, unlined burial pit	Yes, unlined burial pit	Yes, unlined burial pit	Yes, unlined burial pit	Yes, unlined burial pit
Waste transport (off-site)	Yes, by RDHS	Yes	Yes	No	No
Frequency of removal of HCW	Daily (on-site); Twice a week (off-site)	Daily (on-site); Once a week (off-site)	Daily (on-site); Once a week (off-site)	Daily	Daily
Nearest available HCW treatment equipment available	Diyatalawa Base Hospital which has an incinerator, autoclave and wastewater treatment plant Distance - 4 km	Welimada BH Hospital which has an incinerator, autoclave, and biogas unit Distance - 7 km	Badulla Hospital which has an incinerator, metamizers, autoclaves, wastewater treatment plant Distance - 30 km	Badulla Hospital which has an incinerator, metamizers, autoclaves, wastewater treatment plant Distance - 28 km	Welimada BH Hospital which has an incinerator, autoclave, and biogas unit Distance - 17 km
Is there a designated person (s) responsible for organization and management of waste collection, handling, storage, and disposal at the hospital administration level?	Yes, responsibilities assigned to one nursing officer and an SKS	Staff responsibilities not designated, however, one overseer and two sanitary laborers	Two SKSs are expected to take turns	Yes, Female Sanitary Laborer to clean female toilets/drainage area/sinks , Male sanitary Laborer to clean male toilets/drainage area/sinks, Ordinary laborer to sweeps and clean other areas, SKS to clean wards/ ETU/OPD	SKS
Does the waste management staff have job descriptions detailing their tasks?	No	DMO – Overseer -Sanitary laborers (2): segregate, collect and dispose. Hand over to LA	No	No	No
Has he/she received any training on hospital waste management?	No	No	No	No	No
Are there clearly defined procedures for collection and handling of wastes from specified unitsl?	No	No	No	No	No
Additional Remarks (if any)	A small scale incinerator is needed.	Need a suitable method for sharp	-	Inadequate number of staff for collection and	Some of the HCW is handed over to the

Description	Haputale	Uva Paranagama	Metigahatenna	Lunugala	Carklees
	There was a method of weekly collection by RDHS office and handing over to BH Diyathalawa but for last 2/12 years has not happened. No facility to treat and dispose sharps, and lab waste. Coloured bins and bags for separation is not adequate. No adequate manpower for work management. There are only two sanitary laborers (though cader is six.	waste management Need a proper infectious waste management system, protective clothes boots/aprons, etc.		disposal at waste. No proper site to store segregated waste awaiting removal form hospital. Not sufficient supply of protective wear for waste disposal staff (e.g., gloves, boots, aprons Lack of bags for collection of waste into containers.	local authority together with other uncontaminated solid waste

APPENDIX 7(a). Summary of Procedure for Obtaining Written Permission from the Department of Archaeology

Legislation	Regulatory Agency	Summary of Procedure	Time Frame
Under Section 47 read with Section 43(b) of Antiquities (Amendment) Act No. 24 of 1998; Gazette Notification No. 1152/14 dated 04 Oct 2000 Item 4: To make excavations exceeding 500 meters in length for purposes of laying conduit pipes for drainage, water, gas, electricity, and telephones http://www.archaeology.gov.lk/	Department of Archaeology (DA)	1. Proponent to submit an application to DA	During the feasibility stage
		2. DA regional office to conduct preliminary observation and submit a report to DA	About 30 days
		3. (i) If there are no antiquities according to the recommendation and observation report, the land will be released for the project.	
		(ii) If the preliminary observation report has proposed to carry out an archaeological impact assessment survey, steps will be taken to conduct the survey, including scoping with other agencies.	30 days
		4. DA to call for quotations and award contract for archaeological impact assessment (AIA) survey	
		5. Selected agency to conduct AIA survey and submit a report to DA	42 days
		6. DA to submit AIA report to minister in charge of approval	About 30 days
		7. DA to issue approval	

Appendix 7(b): Mode of Requesting Landslide Clearance from NBRO

- Local authorities and other project approving agencies, which approve any construction within the landslide prone districts mentioned above, need to request their clients to submit NBRO's clearance certificate.
- Local authorities and other project approving agencies will issue their clients the copies of the relevant application and the guidelines to complete the application at a nominal fee of Rs. 25.00.
- If the application is issued by a Local Authority or any other project approving agency, the official stamp of that local authority/agency should be clearly placed on the application.
- Clearance is issued under 3 categories.
    - Clearance for building construction

      Applicants, who expect clearance for building construction within the above districts, should obtain the application No. NBRO/01/LAB from the local authority or the relevant project approving agency and hand over the completed application to the same institution from which the application was issued.
    - Planning and land subdivision clearance.

      Applicants, who expect clearance for development planning and/or land subdivision either for personal or commercial purposes, should obtain the application No. NBRO/02/LAD from the local authority or the relevant project approving agency and hand over the completed application to the NBRO district office.
    - Clearance for other construction and development

      Applicants, who expect clearance for implementing any development activity and/or any construction other than buildings, within above districts, should obtain the application No. NBRO/03/LAP from the local authority or the relevant project approving agency and hand over the completed application to the NBRO district office.
- All applications should accompany the following documents.
    - Two copies of the survey plan prepared by a licensed surveyor for the plot of land and the surrounding area.
    - A copy of the deed.
    - A contour plan prepared for the piece of land, at 1:1000 scale, by a licensed surveyor may be required if a detailed investigation has to be performed.
- In addition, following documents will be required depending on the type of application.
    - For Application No. NBRO/01/LAB and Application No. NBRO/02/LAD if any type of building construction is already proposed for the land
      Construction drawings and building layout plan certified by a professionally qualified person (More details can be obtained by referring the instructions provided with the Application).
    - For Application No. NBRO/03/LAP
      A letter issued by the project approving agency requesting the client to submit a clearance certificate from NBRO for the intended project
- The client is required to pay NBRO a fee for investigations and related other expenses. For issuing building construction clearance (Application No. NBRO/01/LAB), the fees are charged as indicated below
- NBRO will provide an estimate for the charges relevant to Applications Nos. NBRO/02/LAD and NBRO/03/LAP

Appendix 8(a): Sri Lanka Standards for Potable Water - SLS 614 (2013)

DRINKING WATER STANDARD - First Revision

(Sri Lanka Standards for potable water – SLS 614: 2013)

PARAMETER	Requirement
A. Physical-Organoleptic requirements	
Colour, Hazen Units, (max.)	15
Odour	Unobjectionable
Taste	Unobjectionable
Turbidity, (NTU) (Nephelometric Turbidity Units), (max.)	2
pH at $25^0C \pm 2^0C$	6.5 to 8.5
B. Chemical requirements	
Aluminium (as Al) (mg/l)	0.2
Ammonia; Free ammonia (as NH_3) (mg/l) Albuminoid ammonia (mg/l)	 0.06 0.15
Anionic detergents (as MBAS (Methylene Blue Active Substances)) (mg/l)	0.2
Calcium (as Ca) (mg/l)	100
Chloride (as Cl^-) (mg/l)	250
Chemical Oxygen Demand (COD) (mg/l)	10
Copper (as Cu) (mg/I)	1.0
Fluoride (as F^-) (mg/l)	1.0
Free residual Chlorine (mg/l)	1
Iron (as Fe) (mg/l)*	0.3
Manganese (as Mn) (mg/l)*	0.1
Magnesium (as Mg) (mg/l) **	30
Nitrate (as NO_3^-) (mg/l)	50
Nitrite (as NO_2^-) (mg/l)	3
Nickel (as Ni) (mg/l)	0.02
Oil and grease (mg/l)	0.2
Phenolic compounds (as C_6H_5OH) (mg/l)	0.001
Sodium (as Na) (mg/l)	200
Sulphate (as SO_4^{2-}) (mg/l) **	250
Total alkalinity (as $CaC0_3$) (mg/l)	200
Total dissolved solids (mg/l), (max.)	500
Total hardness (as $CaC0_3$) (mg/l)	250
Total Phosphates (as PO_4^{3-}) (mg/l)	2.0
Zinc (as Zn) (mg/l)	3.0
Arsenic (as As) (mg/l)	0.01
Cadmium (as Cd) (mg/l)	0.003
Chromium (as Cr) (mg/l)	0.05
Cyanide (as CN^-) (mg/l)	0.05
Lead (as Pb) (mg/l)	0.01
Mercury (as Hg) (mg/l)	0.001
Selenium (as Se) (mg/l)	0.01

C. Bacteriological requirements	
(a) Treatment works and piped distribution system	
E.coli /100ml or thermotolerant coliform /100ml	Not detected
Total Coliforms / 100 ml	(i) Shall not exceed 3 in any 100ml sample (ii) Not detected in any two consecutive samples
(b) Large water supplies	
E.coli /100ml or thermotolerant coliform /100ml	Not detected
Total coliforms	(i) Shall not be present in 95% of samples in a year and (ii) In remaining 5% samples, shall not exceed 10/100ml
(c) Individual or small community supplies (include wells, bore holes and springs)	
E.coli /100ml or thermotolerant coliform /100ml	Not detected
Total Coliforms / 100 ml	Shall not exceed 10

* - Total concentration of Manganese (as Mn) and Iron (as Fe) shall not exceed 0.3mg/l

** - Not more than 30 mg/l Magnesium (as Mg) if there is 250mg/l Sulphate. If there is less Sulphate, Magnesium upto 150 mg/l may be allowed.

Appendix 8(b): Noise Regulations applicable to the sub-project during construction

924/12

PART I : SECTION (1) GENERAL
Government Notifications

THE NATIONAL ENVIRONMENT ACT, NO. 47 OF 1980

REGULATIONS made by the Minister of Transport, Environment and Women's Affairs under section 23P, 23Q and 23R of the National Environmental Act, No. 47 1980 read with section 32 of that Act.

Srimani Athulathmudali
Minister of Transport , Environment
And Women's Affairs

Colombo
21st May, 1996,

Regulations

1. These Regulations may be cited as the National Environmental (Noise Control) Regulations No.1 1996

SCHEDULE III

(Regulation 4)

Maximum permissible Noise Levels at Boundaries of the land in which the source of noise is located in La_{eq}, T, for construction activities.

La_{eq}, T	
Day Time	**Night Time**
75	50

Appendix 8(c): Extracts from Amended Interim Vibration Standards applicable for subprojects

Table 1.1: Categorization of structures according to the type of building (from ISO-4966: 1990E)

Category of the structure of the building		Description
Resistance to the vibration decreasing ↓	Type 1	Multi storey buildings of reinforced concrete or structural steel, with in filling panels of block work, brick work or precast units not designed to resist earthquakes
	Type 2	Two-storey domestic houses & buildings constructed of reinforced block work, precast units, and with reinforced floor & roof construction, or wholly of reinforced concepts or similar, not designed to resist earthquakes.
	Type 3	Single and two-storey houses & buildings made of lighter construction, using lightweight materials such as bricks, cement blocks etc, not designed to resist earthquakes
	Type 4	Structures that, because of their sensitivity to vibration, do not correspond to those listed above 1,2 & 3, & declared as archeologically preserved structures by the Department of Archaeology

Table 2.1: Interim Standards for vibration of the Operation of Machinery, Construction Activities and Vehicle Movements Traffic

Category of the structure as given in Table 1.1	Type of Vibration	Frequency of Vibration (Hz)	Vibration in PPV (mm/Sec.)
Type 1	Continuous	0 –10	5.0
		10-50	7.5
		Over 50	15.0
	Intermittent	0 –10	10.0
		10 –50	15.0
		Over 50	30.0
Type 2	Continuous	0 -10	2.0
		10-50	4.0
		Over 50	8.0
	Intermittent	0 –10	4.0
		10 –50	8.0
		Over 50	16.0
Type 3	Continuous	0 -10	1.0
		10 - 50	2.0
		Over 50	4.0
	Intermittent	0 - 10	2.0
		10 – 50	4.0
		Over 50	8.0
Type 4	Continuous	0 - 10	0.25
		10 – 50	0.5
		Over 50	1.0
	Intermittent	0 – 10	0.5
		10 - 50	1.0
		Over 50	2.0

Notes

1. Please see separate measurement methods
2. The values given above are in such a way that minor damage is unlikely as the nearby house/building

Annex 9: Recording and monitoring the procedures adopted by the contractors to ensure health and safety to prevent spreading of COVID-19

1. What activities were considered when the site work commences?
   Commencement of site works and mobilizing the workers
   Awareness creation, routine, and regular health/ hygienic practices
   Emergency preparedness

2. What precautions have been taken so that workers are not at a risk to expose/infect the virus
   Note: workers at a site near a hospital are more vulnerable to be infected

3. List out the activities that will be carried out at sites and (practical) measures that shall be adopted to contain any infection or spread of disease.

4. List out the measures that will be adopted at site to record the health condition of workers upon reporting to work and their whereabouts and specific activities they had got involved during the previous 2–3 week period.

5. List out the measures that would be adopted to monitor the health condition of the worker force.
   Note that workers/ staff with following conditions should not be allowed to the site.
   Those having fever, with or without acute onset respiratory symptoms such as cough, runny nose, sore throat and/or shortness of breath.
   Those who have had contact with suspected or confirmed case of COVID-19 for the last 14 days.
   Those who are quarantined for COVID-19
   If sick person reports for work, he/she is sent back home immediately.

6. Include the procedure/s that will be followed with respect to managing visitors and other deliveries to site.

7. Include measures that will be taken to provide required PPE to workers, measures taken to enforce them to wear them at site and measures used to dispose the used items such as face masks.

8. List out the routine and regular measures that would be adopted at sites to maintain the health, hygiene and safety of the workforce including office staff (including social distancing where possible).

9. How awareness programmes shall be conducted for the workforce on spread and containment of COVID 19, and on good health and hygienic practices and for workers who return home, and the precautionary measures they should be taking.

10. Provide information on how accommodations, kitchens, meal rooms, labour billets shall be improved to restrain any possibility of contamination.

11. Include procedures that would be adopted in case an infected persons/ suspected case is found at site.

The Contractor or site supervisor may consult the Medical Officer of the healthcare facility (of the sub-project) before mobilization, and obtain his/her opinion/advice. Contact the medical officer and record his/her opinion on site organization and health & safety plans to prevent COVID-19, and safeguard general health of the workers.

Annex 10: Forms to be used for Environmental Monitoring

Environmental Field Monitoring Data Sheet

Health Sector Enhancement Project
Project Management Unit

Date of visit:
Name of HCF:
Location:

	EMP COMPLIANCE						
	Mitigation measures from the EMP	**Progress Level (Activity Implementation Status)**		**Level of Execution (Environmental Rank)**		**Remarks - During this Field Visit**	
		%	**Color**	**Rank**	**Color**	**Photo Taken***	**Observations**
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

Color code	**Level of execution**
	Good
	Moderate
	Poor

IMPLEMENTATION OF THE ENVIRONMENTAL MONITORING PLAN
– To be filled by the PIU/Design Supervision Consultant (at least monthly during after each site visit/ Environmental Specialist (after each site visit)

PIU:

Name of Hospital and District: **Round:**

Monitoring Period (Week/Month/Year):

Impact/mitigation	**Parameters to be monitored**	**Measurement**	**Frequency**	**Status of Monitoring:** - **Satisfactory** - **Partially satisfactory: Improvements needed** - **Not satisfactory** **(Mention any Standards/ Regulations that are referred to)**	**Remedial measures suggested for better monitoring (if status of monitoring is not or partially satisfactory)**
Slope protection and soil erosion control in ground clearing	Final layout plan and detail designs for each site	Check design layouts	Once after designs are completed		
	Adherence to EMP	Visual observation	Once a week		
Minimizing air quality deterioration due to demolition, reconstruction work, stockpiling and movement of heavy vehicles	Confirm if any dust was noted to escape the site boundaries and identify dust suppression techniques followed for site/s.	Visual observation Feedback from hospital users	Weekly		
Controlling noise and vibration levels due to demolition, reconstruction work and movement of heavy vehicles	Adherence to EMP	Visual observation	Weekly		
	Noise and vibration measurements	Noise/Vibration level	Twice during construction		

Containment of soil erosion and contamination	Identify type of erosion and sediment control measures installed on site/s, condition of erosion and sediment control measures including if these were intact following heavy rain	Inspection of site for adequacy of soil erosion/ contamination control measures, evidence of soil erosion and contamination	Weekly		
Proper disposal of construction waste (non-hazardous)	Identify designated areas for concrete works, chemical storage, construction materials, and refueling. Attach photographs of each area.	Inspection of the site for presence of dumps or waste fires, records of waste removed form site, inspection of disposal sites	Weekly		
Proper disposal of construction waste (hazardous and discarded asbestos cement waste)	Identify any chemical stored on site and provide information on storage condition. Attach photograph.	Visual observation of the site for adequacy of measures followed, feedback from contractor team	Weekly		
Proper dismantling, storage and disposal of asbestos cement waste	Method of removal and storage	Visual observation of the site for adequacy of measures followed, feedback from contractor team			
Control of on-site drainage impairment	Adherence to EMP	Visual observation and inspection of site for stagnant water, blocked drains etc.	Weekly		
Containment of construction wastewater discharge	Identify muddy water was escaping site boundaries or muddy tracks were seen on adjacent canals/roads	Visual observation and inspection of site for open discharge of wastewater and pollution	Weekly		
Pollution from labor camps	Adherence to EMP	Visual observation and inspection of the labor camps,	Weekly		

		feedback from construction workers			
Occupational health and safety issues and complaints registered in the GRM	Adherence to EMP	Visual inspection of the site, adequacy of signage and delineation barriers, number of accidents and complaints registered in the GRM	Weekly		
Public health and Safety	Provide information on barricades, signages, and on-site boards. Provide photographs.	Visual inspection of Site and surroundings; Checking if there are any activities being undertaken out of working hours and how that is being managed.			

Any other relevant details:

Name

Designation

Signature

SAMPLE ENVIRONMENTAL SITE INSPECTION REPORT

DISTRICT
HOSPTIAL

NAME: _____ DATE: _____
TITLE: _____

WEATHER CONDITION:
_____

SITE CONDITION (Provide details)

Satisfactory _____ Unsatisfactory _ Partially satisfactory_____

Inspection

Water pollution	Waste Minimization
Wastewater collection and discharge	Reuse and Recycling
Air Quality	Dust and Litter Control
Noise and vibration	Trees and Vegetation
Hazardous Substances	Nuisance

Site conditions acceptable Yes ☐ ☐

INCIDENTS (Provide details – attach additional sheets, if needed)

Resolved Unresolved

INCIDENT 1

Nature of incident:

Intervention Steps to Resolve and conditions

Method of Monitoring

INCIDENT 2

Nature of incident:

Intervention Steps to Resolve and conditions

Method of Monitoring

Signature_____

ADB Financed Health System Enhancement Project (HSEP)

Quarterly Progress Report – Grievance Redressal Issues

PIU: ……. **Period (Quarter ending and Year)** ……

During the Reporting Period, the following are the details of complaints received and complaints redressed.

(i) Details of Complaints Received during the reporting Period

Serial No.	Sub-project (HCF)	Summary of Grievances	Name and address of the complainant	Date of Receipt	Register Number

(ii) Details of Meetings (GRC and other meetings) held to solve the Grievances:

Serial No.	Date and Venue of the Meeting	Details of Participants	Outcome of meetings

(iii) Details of Grievances addressed fully during the reporting Period, including those which have been carried forward from previous quarter[1]

Serial No.	Details of the Grievances	Date Received	Date Redressed completely

[1] Provide details of any grievances not addressed fully during the previous quarter, but addressed fully during this reporting period

Report Prepared by:

Date: