Initial Environmental Examination

July 2018

Sri Lanka: Health System Enhancement Project

Prepared by the Ministry of Health, Nutrition and Indigenous Medicine for the Asian Development Bank.

CURRENCY EQUIVALENTS
(as of 1 July 2018)

Currency unit	–	Sri Lanka Rupee/s (SLRe/SLRs)
SLRe1.00	=	$0.00632
$1.00	=	SLRs158.300

ABBREVIATIONS

ADB	Asian Development Bank
CEA	Central Environmental Agency
DMA	disaster management act
EARF	environmental assessment and review framework
EMP	environmental management plan
EPL	environmental protection license
ETU	emergency treatment unit
GRM	grievance redressal mechanism
HCWM	health care waste management
HSEP	health system enhancement project
IEE	initial environmental examination
MOHNIM	Ministry of Health, Nutrition and Indigenous Medicine
MRM	management review meeting
NBRO	National Building Research Organization
NCDs	noncommunicable diseases
NEA	national environmental act
OPD	outpatient department
PDHS	provincial director of health services
PHC	primary health care
PHCF	primary health care facilities
PIU	project implementation unit
PMCU	primary medical care units
PMU	project management unit
PPE	personal protective equipment
RDHS	regional director of health services
SWL	schedule waste license

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EXECUTIVE SUMMARY

INTRODUCTION

Project Background

Strengthening primary health care (PHC) in Sri Lanka needs priority attention to tackle the rising costs of health care as well as to tackle emerging public health challenges. The current health system under-invests in primary care which has led to poor utilization of primary care level institutions and inefficiency in the overall use of government health care system. 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 Health Sector Enhancement Project (HSEP), financed by the Asian Development Bank (ADB), 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 care), equipping for 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.

This document presents the Initial Environmental Examination (IEE) prepared by the project preparation technical assistance team in consultation and on behalf of the Ministry of Health, Nutrition and Indigenous Medicine (MOHNIM) and covers the rehabilitation and expansion of 45 primary medical care units in all four provinces (Central, North Central, Sabaragamuwa, and Uva). The IEE complies with the project's environmental assessment and review framework (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.

The objective of the IEE is to gather and provide information about specific project interventions, identify potential beneficial and adverse effects on the existing physical, biological and socio-economic environment during pre-construction, construction and operational phases of the project and propose mitigation measures to avoid/minimize project induced negative impacts and enhance positive impacts, with specific attention on providing guidelines for handling hazardous waste such as discarded Asbestos Cement sheet.

DESCRIPTION OF THE PROJECT

Overview

The project will be $60 million (comprising $37.5 million in concessionary loan and $12.5 million grant from ADB, and $10 million equivalent from Government of Sri Lanka in counterpart funds). It is expected to be effective 1 December 2018 and close 30 November 2023. The beneficiary population of the project is approximately 7,000,000 which is 33% of the Sri Lanka population (21,000,000) while the target population within the four provinces, is estimated to be approximately 2,300,000. The project components are threefold:

Output 1: Primary Health Care enhanced in Central, North Central, Sabaragamuwa, and Uva provinces. This output will address (i) development of primary medical care services; (ii) development of primary preventive care services; (iii) public awareness and behavior 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. This output will address (i) health information technology for better continuity of care and disease surveillance; and (ii) support to implementation of IHR-related to ports of entry (POEs).

Output 3: Policy development, capacity building, and project management supported. This output will address: (i) support to policy; (ii) capacity development; and (iii) project management and results monitoring.

POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

National Environmental Regulations

The framework for national environmental management that is relevant for the proposed project is mainly defined by the National Environmental Act (which implements IEE/EIA and environment protection licensing), Fauna and Flora Protection Ordinance, Coast Conservation Act, Antiquities Ordnance and the Soil Conservation Act. However, the statutory requirements for the project from the various ordinances mentioned are limited to the following only (table) as the infrastructure development proposed under the project will be limited to a modest expansion/upgrade of the existing building footprint/facilities on land owned by the HCF. According to national EIA regulations, the project does not require IEE/EIA.

National health sector policy and legislation for HCWM

Health care waste management in the health sector is addressed in a draft policy and national guidelines for HCWM drafted by the government in 2001. The policy recognizes that Healthcare waste generated by the medical institutions must be safely handled and disposed of and that HCWM is 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. The guidelines provide direction in complying with the policy directive. Both these important documents to date remain in draft form despite various attempts in the past for their formal adoption by the government. In 2006 the Ministry of Health developed a national color code for separating the HCW stream which is largely followed by HCF today. In 2008 a comprehensive code of hygiene was developed to complete the existing infection control handbook. The national code of hygiene complements the national guidelines, and contains recommended HCWM procedures and is seen as part of an overall set of actions to control the hygiene conditions within the hospital

Since policy and national guidelines have not yet been formally adopted by the government, there are no binding legal requirements to comply with them. However, these documents remain the main references for HCWM in the country and are followed by the larger HCFs to implement HCWM systems. For developing HCWM plans under HSEP, the policy and national guidelines will be used to set direction.

ADB Safeguards Policy Statement, 2009

According to the SPS 2009, all projects and programs financed by ADB need to comply with safeguards requirements set out in the policy statement. As such the project triggers the policy on Environmental Assessment and accordingly the project has been designated as a safeguards Category B requiring an EARF for the whole project and an IEE for the readiness package of 45 HCFs.

This table depicts the clearances and compliances required by HSEP

Activity	Relevant legislation	Statutory requirement	Authorizing body
Disposal of Health Care Waste	NEA	EPL/SWL	CEA
Discharge of wastewater effluents	NEA (Protection and Quality) Regulation No. 1 of 1990 published in Gazette Extraordinary No. 595/16 of February, 1990	EPL	CEA
Air emissions	National Environmental (Ambient Air Quality) Regulations, 1994, published in Gazette Extraordinary, No. 850/4 of December 1994 and amendment gazette No. 1562/22 of 2008	EPL	CEA
Disposal of solid waste	National Environmental (Municipal Solid Waste) Regulations, No. 1 of 2009	Consent for disposal site	CEA
Emission of noise and vibration	National Environmental (Noise Control) Regulations No.1 of 1996 and its amendments	Compliance	CEA
Construction on steep slopes in the central province	DMA	Compliance	NBRO
Renovation and operation of HCF	AD B – safeguards policy statement 2009	Clearance for IEE/EMP	ADB

DESCRIPTION OF THE ENVIRONMENT (PROJECT AREA)

HSEP will be implemented in provinces of Central, North Central, Sabaragamuwa, and Uva. The PHCFs selected for upgrading under the project are scattered across the provinces.

Central Province. The Central province has land extent of 5,674 km^2 and is in the center of the country which includes the mountainous regions characterized by peaks, valleys, plateaus and steep escarpments. Based on the major climatic zones the districts fall into upcountry wet and dry and mid country intermediate and wet zones. The climate is cool with a rainfall ranging from 5,000 m on the wet slopes to 2,000 mm on the dry slopes. Most of the major perennial rivers of Sri Lanka including the Mahaweli and Kelani rivers originate from the central hills located in this province. The region holds the country's most important watershed areas with high conservation value forests containing high biodiversity and endemism. The forest cover in the districts as reported in the 1991 census 19.5, 44.9 and 30.4 % for Kandy, Matale and Nuwera Elia districts. The total population in the province is 2,423,966 and includes a mixture of Sinhalese, Tamils and Muslims. Agriculture is the prominent economic activity employing majority of workforce in Nuwara Eliya (67.4%) and Matale (43%) districts, while majority of the workforce is employed in services sector (50.5%) in Kandy district.

Landslides are the biggest threat of natural disasters in the province. Given the predominantly hilly terrain of the province, flash floods are experienced in some areas, however flooding is not a major threat. Deforestations with adverse consequences such as soil erosion and land degradation are one of the main issues in the region. Another key issue is the application of inorganic chemicals in the agricultural and plantation fields which eventually gets washed off to the rivers and their tributaries causing much water and soil quality deterioration.

All the HCFs selected for renovation under HSEP are located within small townships with good road access and enough space within present land parcels for proposed expansions. No major environmental issues are observed, other than the potential for soil erosion and minor earth slips in some places.

Uva Province

Uva Province consists of the Badulla and Moneragala administrative districts with a land area of 8500 km2. The mountain ranges within the district rises to an elevation of 1200–1800m. Monaragala district lies in the transitional zone form central highlands to flat lowland and is characterized by terrains that vary between highly mountainous, undulating and flat. Badulla district belongs to the intermediate zone of the country with an average annual rainfall around 2000 mm and temperature that varies between 20-25^{o}C while Monaragala district belongs to the dry zone of Sri Lanka with an average rainfall that varies between 1300- 1800 mm and a daily mean temperature between 22-29^{o}C. Several important rivers and head streams drain both districts. Natural vegetation of the district consists of wet zone forests, intermediate zone forests, dry zone forests scrublands and grasslands dry pathana grasslands, savannah grasslands and scrublands There are several high value conservation areas in the region as well that are protected. The population within the province is 1,259,800 representing all ethnic and the religious group in the country. The main economic drivers of the province are agriculture and livestock.

Deforestation and soil erosion leading to land degradation are two of the key environmental issues in the province and gives rise to a series of other interrelated issues such as earth slips, drying of springs, wells and water courses, and the silting of tanks, rivers and tributaries. Agricultural practices such as chena and tobacco cultivation on steep slopes has caused severe land degradation caused by soil erosion and the prolonged use of pesticides in tea and other plantation fields is believed to have caused much soil and water contamination.

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Sabaragamuwa Province

Sabaraganmuwa Province consists of the Kegalle and Ratnapura administrative districts spreading over a land area of 4968 Km2. The altitude of the region varies from 30 m 2000 MSL. Both districts exhibit complex topographical features that consists of hills and ridges, broad valleys, gorges and plateaus. Climatically both districts belong to the low-country wet, mid-country wet and up-country wet zones. Kegalle district receives a rainfall over 3000 mm per year where as Ratnapura gets an annual average of about 4000-5000 mm and is the country's wettest district. The mean annual temperature varies between 22.5^{0}C to 35^{0}C. Both districts are home to several watersheds and diverse ecological landscapes. The forest cover in Kegalle is classified into dense forests, open forests and planted forests which occupy about 9.8% of the total land area. In contrast the forest cover in Ratnapura is about 21% and includes rain forests of Sinharaja and Kithugala. A total population of 1,919, 497 reside in the province with a population density of 335 ad 497 persons per Km^{2}. Agriculture is the prominent economic activity and is carried out very successfully in these two districts. industries play a main role in the district economies with 27.5% of the total employed in Ratnapura and 35.3% of the total employed in Kegalle engaged in the industrial sector. The mineral extraction is a leading industry in Kegalle where the Bogala graphite is located which is responsible for half of the total mineral exports from Sri Lanka. Tourism is also a key economic sector, especially in Ratnapura with the presence of many tourist attractions such as Sinharaja rain forest and Udawalawe National Park. In Kegalle,

According to the landslide hazard mapping carried out by the National Building Research Organization, both districts carry a high risk of landslides. Landslides are common during the rainy

season and cause much damage to life and property. In Ratnapura, flooding is a yearly occurrence caused by the overflowing of the Kalu ganga and its tributaries.

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North Central Province

North Central Province consists of the administrative districts of Anuradhapura and Polonnaruwa covering a land area of 10,475 Km2. Both districts are situated between the northern most boundary of the central highlands and the dry low country flats of the north. The terrain is predominantly flat with an average altitude of 81m. The ancient capitals of Anuradhapura and Polonnaruwa are the main cities in each district. Climatically, both districts fall in to low country – dry zone. The province is comparatively dry with an annual average rainfall between 1300 – 1600 mm and average temperatures ranging from 27^0C to 30^0C. The North Central Province is home to Sri Lanka's ancient hydraulic civilization consisting of intricate irrigation systems with massive reservoirs and smaller cascade systems that dot the landscape. In addition, many major rivers flow through this region. The many man-made lakes have become thriving natural wetlands providing invaluable ecosystem services to the country. The province also holds several strict nature reserves, nature reserves, national parks and sanctuaries. The total population in the north central province is 1,260,181. Population density of Anuradhapura and Polonnaruwa respectively are 129 and 131 persons per Km^2. Agriculture is the prominent economic activity in the province.

Floods, deforestation, human-wildlife conflict and water pollution caused by inorganic chemicals in intense agriculture are the main environmental issues in the region. The prevalence of the CKDu is highest in the province and is a major public health challenge for the government.

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KEY ANTICIPATED ENVIRONMENTAL IMPACTS AND PROPOSED MITIGATON MEASURES

Positive impacts and environmental benefits. The HSEP will provide better health care services to the poor in the lagging regions of the country. As a result, both the country's health services and the health status of the population will improve leading to a reduction in household expenditures and time spent seeking medical care with long-term indirect environmental benefits.

Negative Environmental Impacts

Impacts due to collapse of soil banks and landslides. As the terrain of the Central and Sabaragamuwa provinces are predominantly hilly and landslide prone, there is a risk of minor landslides and collapse of soil banks occurring if natural slopes are destabilized without adequate care during site preparatory activities under extreme rainfall conditions. In a majority of the HCFs the treat of landslide is minimal, however given general hilly terrain caution needs be practiced.

Impacts from removal of full grown trees. Very few trees would need to be removed and that too can be confirmed only on availability of final designs. Space in not a constraint in all the HCFs excepting Haldamulla, hence site layout should avoid removal of large trees.

Impacts on air quality. Air quality within the sites will suffer temporarily due to fugitive dust generation from demolition, construction, stockpiling and transporting activities. The impact will be short-term and localized but moderate to significant because the hospital is often visited by patients seeking treatment for poor respiratory health. Since most of the areas belong to the rural sector with large land parcels, neighborhoods are unlikely to be badly affected.

Mitigation measures

- Full delineation of the construction area by a dust/noise/safety barrier using Amano sheets, tarpaulin or other suitable material to a maximum height of 7 meters or more.
- Daily cleaning of site and regular watering (at least twice daily) of dusty collecting areas.
- Covering of earth piles with tarpaulin or other suitable material.
- Storing construction stockpiles and debris away from the functional areas of the hospital.
- Covering transportation trucks carrying earth, spoil or construction material to and from the sites.
- Imposing speed control for construction vehicles 500m from the site.

Impact on noise and vibration

Noise and vibration are two key impacts that will result from the demolition and construction work, which will be a nuisance to hospital staff, patients and neighborhood. The elevated noise levels will be a localized and temporary impact that will last throughout the construction period (which will be about 6 months). However, given that the work sites are hospitals and hence sensitive to impacts of noise and vibration, maximum mitigation must be practiced.

Mitigation measures

- Restriction of the use of noisy machinery and where unavoidable use noise-reducing means for means for construction machines.
- Limiting construction activity to 8.00 am to 6.00 pm daily.
- If certain night time construction activities are unavoidable, it should be done using noise reducing means or low-noise technologies.
- Locating noise generating activities such as concrete mixing away from the hospital facilities.
- If needed, moving patients at-risk to a less impacted sections of the hospital (in most DHs wards are located away from the OPD area. This issue does not arise in PMCUs).
- Ensuring vehicles and equipment used in construction work meet CEA standards for noise and vibration in Sri Lanka.
- Ensuring that noisy construction machines/activities (such as pouring concrete for slabs) are scheduled for days that patient visitation to the facility is minimum.

- **Impacts on drainage and water stagnation**

It is important 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 within construction sites also carry the risk of mosquito breeding.

- **Mitigation measures**
- Maintain cross drainage within the site always during construction.
- Create alternative paths to facilitate storm water flows from the site to outside.

- Clean the lead away drains that collect water from the internal drainage system of the HCF to ensure a smooth flow of storm water.
- Check construction ground/s daily (after wet weather) for any signs of water stagnation and cleaned.

Impacts due to disposal of solid waste debris including Asbestos

Demolition and reconstruction of part of the HCF will generate large quantities of solid wastes that will include rubble, pieces of old floor tiles, roof tiles and asbestos cement sheets, used ceramic fittings, wiring, plumbing, empty cement bags, polythene covers, metal items, plastic items, earth mounds and others that require careful management of disposal. Open dumping these in low-lying lands such as wetlands, paddy fields, stream shores and abandoned land has serious environmental consequences. Many of the HCFs currently use asbestos cement as roofing sheets and this will be a waste that needs extreme care in disposal.

Mitigation measures

- Contractor to solid waste disposal plan with estimated waste quantities and opportunities identified for re-use, recycle and permanent disposal.
- Dispose rubble from demolished buildings only in areas recommended by the Pradheshiya Sabha and the Engineer.
- No burning of any solid waste on-site
- Discarded Asbestos sheets should be handled and disposed with extreme care and according to a hazard risk assessment and mitigation plan prepared by the PMU.

Impacts due to occupational health and safety

Occupational health and safety is one of the key risks of the project to be addressed. The risk is not only for construction workers but also for hospital staff and the many patients who visit the hospital daily. Excepting 2 or 3 PMCUs (Narissa in Ratnapura and Hewadivula in Kegalle) within the list of 45 HCFs, all other PMCUs and DHs are functioning and visited daily by many out-patients (ranging from 75 – 350 daily) seeking treatment.

Mitigation measures

- Physically delineate and separate construction site from the rest of the hospital.
- Create safe pedestrian pathway to the hospital building or the temporary OPD area, if regular access is blocked.
- Isolate all excavations and installation that are not accomplished and post warning signposts and flash lamps during nighttime.
- Use delineation devices such as cones, lights, tubular markers, barricades tapes, warning signposts, etc. to inform hospital users about work zones.
- Install dangerous warning signs if needed to keep public away from specific hazards.
- Provide appropriate PPEs and ensure that safe working methods are applied.
- Provide training programs on occupational health and safety for workers and hospital staff.
- Prepare site safety checklist.
- Establish procedures for receiving, documenting and addressing complaints.
- Notify hospital staff and users on construction schedule.

Impacts due to extraction of water for construction purposes

Supply of good quality drinking water in adequate quantity was observed to 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 supplier, other HCFs obtain water from a variety of sources such as treated/untreated rural schemes, springs, shallow ground wells and tube wells. About 5 HCFs had

fixed RO filters gifted by various charities. Most places complained of unreliability of piped connections and poor water quality of ground sources.

- Assess availability of water for construction purposes in a site-specific manner.
- Where water stresses exist, arrange contractor's own supply of water.
- If sharing of limited water supplies within the hospital or in the local area is permitted, necessary approvals must be obtained from the relevant authority.

Generation of HCW

The key environmental impact encountered during the operation phase of the project is related to the management of health care wastes. Currently, management of health care waste generated in all the 45 facilities visited is sub-optimal and carry many risks. The proposed ADB investment will increase the current generation of HCW with improved facilities that aim to promote better utilization of the primary care sector.

To assess the risk, type and quantities of HCW generated from each category of HCF must be studied. Since primary HCFs offer limited health services and had low bed occupancy, the types and quantity of hazardous HCW generated are limited. Nevertheless, the risk of accidental disease transmission such as hepatitis and AIDS is high; hence proper management of HCW from its point of generation to disposal is critical.

Currently, a good attempt is made in all the HCFs to segregate waste according to its hazardous nature. However, this segregation is not maintained during disposal where mixed waste is bunt behind the hospital either in the open garden, in a pit, cement basin or in abandoned buildings. None of the facilities had any information about the amount of hazardous health care waste generated per day.

The only primary HCF that has treatment equipment and possess an EPL from the CEA is the DHB of Tanamalwila in the Moneragala district. The Moneragala district is the most progressed in terms of HCWM, where much of the infrastructure for waste storage is in place and equipment for waste handling and treatment are either in place or planned to be in place at the end of 2018. Overall, current practices of waste handling and disposal in almost every HCF, excepting to some extent in Tanamalwila, greatly compromises hospital hygiene and safety of health workers as well as the public. None of the HCFs have a HCWM plan or trained personal/team with designated responsibilities. Special storage areas for HCW are available only in 4 HCFs in Moneragala. Others do not have storage space and hence burning is done daily. Personal protective equipment is hardly worn by health workers who hand carry waste bins daily to the disposal site.

Liquid health care waste from the laboratory is generally discharged to a soakage pit. In Haldamulla it was highlighted that lab waste flows in common storm water drains posing serious risks to hospital hygiene and infection control. Deliveries are rare in DHs, but when they do placentas are buried in lined/unlined pits.

Some HCFs collect plastics refuse such as saline bottles and used syringes are collectedand sent for recycling. Recycling 'used' syringes pose a very serious threat if they are not sterilized after usage, especially if the needle has not been discarded. Discarded syringes that are intact can also be re-used by people. This has been identified by the WHO as the most serious threat for the spread of infections such as Hepatitis and HIV. Therefore, collectors of plastic items, workers in the factory and the public face a grave risk from untreated syringes that are improperly discarded or put to secondary use.

Mitigation measures

- Each of the 45 HCF to develops its own HCWM plan in close consultation with the regional health services. The plan must address: (i) An estimation of the quantities of hazardous and non-hazardous HCW generated at the facility through a waste audit. (ii) clear procedures for segregation, handling, collection, internal transportation, storage, treatment and final disposal of hazardous HCW (iii) equipment needed (iv) standardized waste collection time tables from each ward and department (v) a budget for implementing the HCWM plan (vi) strategy for raising awareness among hospital staff about risks associated with HCW (vii) training and capacity building program for health workers on HCWM.
- Several considerations will be involved in the final selection of treatment and disposal method including availability of financial allocations, availability of technical backstopping services in the region, installed yet underutilized treatment capacity in the region/district, provincial preference for a centralized/decentralized system, etc. Opportunities to gain economies of scale in meeting treatment as well as maintenance costs must be strongly considered.
- Except for Moneragala district, all other districts plan to drain HCW from PCMUs and DHs to the closest base or general hospital that has a treatment system already installed. A summary of the available treatment capacity at the province level is highlighted in the
- Provide needle burners to each ward/department in the HCFs so that destruction of sharps (most common reason for injury and accidental disease transmission) can be carried out at the point of generation.
- Construct storage facilities with separate compartments for each category of waste.
- Provide PPEs for health workers to start using immediately.
- Design a structured training program

Generation and disposal of healthcare wastewater

Health care waste water 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) grey water containing discharge from washing, cooking, bathing, laundering with low potential for pollution. Sewage generated in HCFs is potentially hazardous and infectious as they carry pharmaceutical chemicals and disease-causing bacteria, viruses and parasites. The risks include (I) contamination of local drinking water sources (ii) degradation of aquatic habitats and (iii) outbreaks of water-borne diseases

None of the institutions considered here have piped sewerage or wastewater treatment and the effluent is disposed in septic tanks and soakage pits. With bed occupancy rates expected to improve after the project an increased load of wastewater discharged can be anticipated. Many of the PMCUs do not have a toilet presently and the proposed upgrades would include toilets for patients and staff separately.

Mitigation measures

- Provide sewage and wastewater treatment at least for DH types A and B.
- All new toilets built in other units under the project should be discharged to septic tank/soakage pit system. Siting of the pits should be planned to take into consideration distance to ground water wells and other water sources.

INSTITUTIONAL REQUIRMENTS AND ENVIRONMENTAL MANAGEMENT & MONITORING PLAN

The project will be implemented by a PMU set up at the MOHNIM. 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.

Within the above structure planning, implementation and supervision of environmental safeguards will take place at three levels:

- **MOHNIM** - The overall responsibility of ensuring compliance with the EMP and monitoring plan will be borne by the main PMU. It will be supported by a full-time environmental specialist. The PMU will also be supported by a Consultant specialized in HCW planning and management (which is part of the EMP requirement) who will provide technical assistance to HCF for the preparation of HCWM plans and capacity building.

- **Provincial Directorate of Health Services (through local PIUs)** - An engineer appointed as the focal point for coordinating with the environmental specialist of the PMU will ensure day to day monitoring of EMP implementation.

- **Contractor –** contractor will be responsible for implementing the EMP and 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.

INFORMATION DISCLOSURE, CONSULTATION AND PARTICIPATION

Consultation and participation during project preparation. During project design and preparation of this IEE, different public and stakeholder involvement processes were used to gather stakeholder input on sector needs, project design and configuration. Formal workshops as well as informal interviews and face to face discussions were held with health administrators, health workers and the public to ensure adequate consultation.

The public using the HCFs (both males and females) as well as the hospital management teams have positive attitudes towards the government's plans to focus on the long-neglected primary care sector to improve the basic services available to the local population. They perceived main benefits of the project as (i) savings on travel time and cost for the community, (ii) relieving pressure on the over-burdened higher-level facilities, (iii) improving working conditions for health workers, and (iv) improving facilities and safety of the environment for those who seek OPD treatment.

Disclosure of information

According to the requirements of the ADB's Safeguards Policy Statement (2009), the draft IEE will be disclosed on the ADB website before the Staff Review Meeting (SRM) as well as disclosed locally on the website of the MOHNIM.

KEY FINDINGS AND RECOMMENDATIONS

The field visits conducted observed that none of the 45 primary health care facilities are located within or adjacent to areas that are ecologically sensitive or environmentally problematic. All of them are situated in rural townships surrounded by mixed land use.

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 asbestos cement roofing sheets, construction wastewater and operation of labour camps, (iii)

onsite drainage impairment, (iv) soil erosion and potential for minor landslides, and (v) increased risk of occupational health and safety for construction workers, health workers and hospital visitors. All these impacts can be minimized and mitigated with the adequate implementation of the provisions given in the EMP.

The current practices of hazardous health care waste management in all the hospitals (except Tanamalwila DH) are inadequate and unhygienic. Segregation of waste at source is not maintained throughout and finally the waste is open burnt. With the increased utilization of primary care facilities, the waste produced is bound to increase raising the risks for public health and environment. Therefore, the IEE recommends that:

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.

Sewerage systems for at least the larger facilities such as Divisional Hospitals A and B should be considered a priority.

Water supply facilities be improved in HCFs that face severe water shortages and cannot even maintain basic hospital hygiene.

The EMP and the monitoring plan provided in the Annex are not final as the site layouts and final design details are still being worked out. As such, the EMP and the monitoring plan must be updated with package specific information before tender publishing and to include the updated EMP in the bid document.

CONCLUSIONS

Findings of the IEE confirm that the positive impacts of the project far outweigh negative impacts arising out of the proposed civil works and hospital operations.

None of the environmental impacts identified are irreversible and widespread, rather they are localized, temporary in nature.

With good site management and safety practices, these impacts can be effectively managed.
Stakeholder consultations reveal that the demand for better primary health care by the local community is high, who currently face numerous difficulties in incurring significant expenses by having to travel great distances to higher grade hospitals for treatment.

As such, the project will be a positive step towards providing better health services to the poor communities in the lagging regions of the country as well as prepare the country to face emerging health sector challenges successfully in the coming decades.

I. INTRODUCTION

A. Project Background

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 has been increasing due to the sharp rise in noncommunicable diseases linked to lifestyles and rapidly aging population. The national health system needs to further improve to expand services to vulnerable populations with lagging health indicators. In addition, there is 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 curative care and preventive health services—in Sri Lanka needs priority attention to tackle the rising costs of health care as well as to improve basic 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 largely 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 hospital care is costly, overuse of hospital services also creates inefficiency in the use of government health expenditures.

3. 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 further inform and help operationalize PHC reform initiatives.

4. The proposed Health Sector Enhancement Project (HSEP), financed by the ADB, 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 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.

5. This document presents the Initial Environmental Examination (IEE) prepared by the project preparation technical assistance team in consultation and on behalf of the Ministry of Health, Nutrition and Indigenous Medicine (MOHNIM) and covers the rehabilitation and expansion of 45 primary medical care units in all four provinces (Central, North Central, Sabaragamuwa, and Uva). The IEE complies with the project's environmental assessment and review framework (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. Objectives of the project

6. As stated, the broad objective of the project is to improve services offered by the primary medical care facilities that include primary health care units (PMCUs), divisional hospitals (DHs) and field health centres. To support the project objectives, selected primary medical care facilities and field health centres in the four provinces will be upgraded with the following broad guidelines.

(i) Improving services of the outpatients' department by expanding the patient waiting areas to accommodate greater numbers and adding more consultation rooms, dressing rooms, examination rooms and staff/patient rest rooms
(ii) Upgrading/renovating drug stores and dispensary
(iii) Constructing/renovating laboratories, dental units and ETUs

C. Objectives of the Initial Environmental Examination

7. As mentioned earlier, this IEE covers the upgrading and renovation of 45 primary health care units that consist of 19 PMCUs, 2 DH type A, 11 DH type B and 13 DH type C located in the Central, North Central, Sabaragamuwa, and Uva provinces. These 45 PMCUs/DHs are prioritized among a total of 135 to be upgraded and renovated.

8. The objective of the IEE is to gather and provide:

(i) Information about specific project interventions.
(ii) Information about the general baseline environmental setting of the larger project area with special reference to the land-use and existing environmental sensitivities of the specific locations of the 45 facilities.
(iii) Identify potential beneficial and adverse effects on the existing physical, biological and socio-economic environment during pre-construction, construction and operational phases of the project.
(iv) Propose mitigation measures to avoid/minimize project induced negative impacts and enhance positive impacts, with attention on providing guidelines for handling hazardous waste.
(v) Formulate and effective environmental management plan (EMP) which can be used as a template for all 45 facilities with guidance on site-specific issues to be included in the individual bidding documents, including costs of mitigation and institutional responsibilities.
(vi) Provide information on the public consultation process undertaken, and the project level grievance redress mechanism (GRM) established.

D. Approach, Methodology and Personnel Involved

9. This IEE was carried out based on:

(i) Review of literature pertaining to the baseline environmental conditions of the project area general status/plans about health care waste management in the country.
(ii) Environmental screening of each site.
(iii) Discussions with key government agencies such as MOHNIM, provincial and regional directorates of health services and the Ministry of Environment to obtain their strategic views of the project.

10. Environmental screening for each site included (I) a field visit to each of the 45 primary medical care facilities to make direct observations of the areas and (ii) filling of an environmental checklist on-site based on direct observations and consultations with medical staff, health workers and patients to record site specific data supported by photo documentation. A sample environmental checklist is appended to this IEE for reference.

11. The proposed project interventions were identified through the engineering site reports prepared by the Engineer in the team in close collaboration with the health authorities which conceptually outlined the required infrastructure upgrades and additions for each facility to provide better primary patient care. As mentioned, an environmental checklist was prepared for each candidate site and the IEE was prepared based on these for the entire package with summarized information from all the sites. Since detail designs are still being prepared the exact footprint of the civil works is not known, as such it was not possible to estimate, for example, the number of large trees that would need removal. The Project Management Unit will be required to revisit the EMP provided in this IEE on availability of detail designs for each site to fine-tune the mitigation measures.

12. The field assessments, preparation of the checklists and the IEE was carried out by the environmental specialist in the PPTA team.

II. DESCRIPTION OF THE PROJECT

A. Overview

13. HSEP will be the first ADB financed health operation in Sri Lanka after a gap of 20 years. This re-entry project will be for $60 million (comprising $37.5 million in concessionary loan and $12.5 million grant from ADB, and $10 million equivalent from Government of Sri Lanka in counterpart funds). It will be delivered through a project investment modality and is expected to be effective 1 December 2018 and will close 30 November 2023.

14. The proposed project will improve efficiency, equity, and responsiveness of the primary healthcare (PHC) system based on the concept of providing universal access and continuum of care to quality essential health services.

15. The project considers an equity perspective in planning and delivering of essential primary health services. It expects to further inform and operationalize government primary health care (PHC) reform initiatives, while improving underserved communities' access to primary health services, and address selected gaps in core public health capacities in line with the international health regulations (IHR).

16. The beneficiary population of the project is approximately 7,000,000 which is 33% of the Sri Lanka population (21,000,000) while the target population within the four provinces, is estimated to be approximately 2,300,000.

B. Impact and Outcome

17. The expected project impact is to ensure a healthier nation by supporting a more responsive and comprehensive primary health care system in Sri Lanka. The project outcome is to improve efficiency, equity and responsiveness of the health system. There are three project outputs:

(i) Output 1: Primary Health Care enhanced in Central, North Central, Sabaragamuwa, and Uva provinces
(ii) Output 2: Health information and disease surveillance capacity strengthened
(iii) Output 3: Policy development, capacity building, and project management supported

a. Output 1: PHC enhanced in Central, North Central, Sabaragamuwa, and Uva provinces

18. The output one of the project intends to strengthen the primary health care (PHC) services in the target provinces of Central, Sabaragamuwa, Uva and North Central with a special focus on the socially, economically and geographically disadvantaged populations.

19. The PHC services are defined as primary health care services that are provided via curative level facilities (Primary Medical Care Units and the Divisional Hospitals), and via the preventive health network led by the Medical Officers of Health. Output 1 of the project will address the following aspects of PHC services defined in four sub-activities.

a. Development of primary medical care services
b. Development of primary preventive care services
c. Public awareness and behavior change communication for increasing PHC utilization and creating demand.
d. Strengthen PHC management for continuity of care

b. Output 2: Health information and disease surveillance capacity strengthened

20. This output intends to strengthen health and disease surveillance to provide real time sharing of health information across levels of facilities and across different episodes of care for an individual patient. This will help enhance the disease surveillance capacity of the system and will establish a system for continuity of care to health seekers. The proposed pilot intervention of establishing a cluster of facilities (PMCUs and DHs linked to one secondary health care facility based on health seeking behaviour and road accessibility to the facilities) in each of the districts (9 clusters) will facilitate the notification process of the 28 notifiable diseases of Sri Lanka and improve the quality of care received by health seekers at the PHC level.

21. Furthermore, this output will initiate to establish a real time link from curative to preventive primary health care for early initiation of disease investigation of the notifiable diseases by the field based public health inspectors attached to the medical officer of health areas.

22. In addition, this output intends to also support the government of Sri Lanka to implement the recommendations of the Joint External Evaluation of the International Health Regulations. (IHR).

23. Output 2 of the project will address the following aspects health and disease surveillance defined in two sub-activities:

(i) Health information technology for better continuity of care and disease surveillance; and
(ii) Support to implementation of IHR-related to ports of entry (POEs).

c. Output 3: Policy development, capacity building, and project management supported

24. Output 3 of the project intends to support policy development to enhance the impact of the project activities. As the project envisages to strengthen PHC in Sri Lanka with a focus in the lagging provinces to provide a responsive and a comprehensive package of services to the population, it is essential to focus in a few prioritized policy areas that need to be addressed for successful implementation of the project. This Output will support policy related tasks to improve PHC services in Sri Lanka, as well as establishment and operations of project management and implementation units.

25. Output 3 of the project intends to support the following tasks described in three sub-activities:

(i) Support to policy;
(ii) Capacity development; and
(iii) Project management and results monitoring.

III. ALTERNATIVE ANALYSIS

A. No project alternative

26. Current health statistics show that the health sector of Sri Lanka is facing new challenges with rapidly changing demographic and epidemiological patterns. While the country has successfully dealt with deaths due to communicable diseases and those relating to maternal, childbirth and perinatal causes, deaths due to NCDs and accidents are sharply on the rise. Chronic NCDs are long term debilitating disorders that require lifelong patient treatment and management. Similarly, most accident victims too require extensive care at both hospital and community levels during rehabilitation and follow up. Most of these patients are from economically active age groups causing an irreparable economic loss to the country. It is also known that most of the secondary and tertiary health care facilities are overcrowded with patients and having exceptionally high bed occupancy rates, while the PHC facilities continue to be underutilized with bed occupancy rates as low as 25–40%. The implications of this situation on health expenditure are overwhelming. Taking these facts into consideration, the GOSL is seriously thinking of its re-orienting its health care strategy and to move the PHC service forward to face the emerging challenges. HSEP is an early attempt to support the GOSL in its current thinking. It will rehabilitate 135 PHC facilities (focusing on ambulatory services) and equip them to better deliver curative and preventive health services.

27. A no project alternative would mean that PHC sector will continue to be under-utilized and under-developed causing the burdens of changing disease patterns and rising health costs to adversely affect the sector and in the long-term undermine the commendable achievements that Sri Lanka has gained in its health indicators.

B. With project alternative

28. There is a good network of PHC facilities in the country that are already established and functioning but underutilized which the project hopes to improve and promote better utilization. The project will develop the ambulatory and other essential services in 135 PHC facilities spread across the 9 districts which will provide more effective preventive and curative care to the local community who would benefit vastly from savings in out-of-pocket health expenses and long-distance travel to higher level hospitals seeking better treatment. Savings on travel time for

patients and families would provide them the opportunity to spend more time on their livelihood activities as well. Therefore, the project is an essential investment that will help make good use of existing hard and soft ware in the primary health care sector.

IV. POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

A. Relevant national environmental regulations

29. The National Environment Act (NEA) No 47 of 1980 and its amendments provide conservation and development guidelines for natural resources including water, soil, fisheries resources, forest, flora and fauna in Sri Lanka. It is the basic national decree for protection and management of the environment and paved the way for the creation of the Central Environmental Authority. The NEA has seen several amendments in the past in a bid to continually make improvements and to respond to the challenging needs of the time. There are two main regulatory provisions in the NEA implemented by the Central Environmental Authority (CEA) through which impacts on the environment from the process of development is assessed, mitigated and managed.

- The Environmental Impact Assessment (EIA) procedure for major development projects. Regulations pertaining to this process have been published in 1993 and are available with the CEA.
- The Environmental Protection License (EPL) procedure for the control of pollution. Regulations pertaining to this process have been published in 1990 and are available with the CEA.
- Scheduled Waste License procedure for the management and control of hazardous waste disposal.

B. Environmental Impact Assessment

30. The Sri Lankan Government recognizes EIA as an effective tool for integrating environmental considerations with development planning. The application of this technique is considered as means of ensuring that likely effects of development projects on the environment are fully understood and considered before development can proceed.

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

C. Environmental Protection License

32. The Environmental Protection License (EPL) is a regulatory/legal tool that has been introduced to control and prevent pollution from waste discharges through the adoption of appropriate pollution abatement technology. The NEA specifies categories of ‘prescribed projects’

which would need to comply with these regulations and are supported by gazetted discharge and emission standards depending on the industry type as well as the receiving environment.

33. The EPL regulation classify industries into three categories, namely, A, B, and C corresponding to high, medium and low polluting potential of the relevant activity discharging/emitting waste into the environment. While EPL for A and B categories are directly administered by the CEA, issuing EPL for category C is delegated to the local authorities under the powers of the NEA.

34. In support of the EIA and EPL processes, the CEA has published standards for various parameters such as effluent quality, air quality, noise and vibration.

35. **Applicability of the NEA to HSEP.** The civil works envisaged under the project do not fall within prescribed categories of the NEA for environmental impact assessment and as such IEE/EIA are not required. However, discharge of health care waste during operation falls within the prescribed category for pollution control, and as such, all HCFs is required to obtain an EPL. Environmental standards pertaining to effluent quality, air quality, noise and vibration will be applicable to the project where the contractor and the HCF is obligated to comply with stipulated levels during construction and operational levels.

36. **The Coast Conservation Act No 57 of 1981 amended by Act No 64 of 1988.** The Coast Conservation Act (CCA) makes provisions for the regulation and control of development activities within the coastal zone as well as formulates and executes schemes of work for coast conservation. The law specifies that projects located wholly or partly within the coastal zone (the area lying within a limit of three hundred meters landwards of the Mean High Water line and a limit of two kilometers seawards of the Mean Low Water line) must undergo the approval process that is laid down in the Coast Conservation Act irrespective of its size. Only those projects located totally outside the Coastal Zone will be subject to the approval process laid down in the National Environmental Act. Therefore, any development work taking place within this zone falls under the jurisdiction of CCD. According to the CCA, Director of the CCD has the discretion to request for an EIA/IEE from the project proponent if the initial screening reveals significant impacts in the coastal areas by the project. The process is very similar to the NEA excepting that the Director of the CCD reserves the right to request for an EIA/IEE and to make a final decision.

37. **Applicability of the CCA to HSEP.** The project area does not have coastal areas, hence the CCE will not apply.

38. **The Fauna & Flora Protection Ordinance (FFPO) Act No 49 of 1993 and its amendments.** This act provides for the protection, conservation and preservation of the fauna and flora of Sri Lanka. According to this Act, any development activity of any description what so ever proposed to be established within a national reserve or within one mile from the boundary of any national reserve, is required to be subjected to EIA/IEE, and written approval should be obtained from the Director General, Department of Wildlife Conservation prior to implementation of such projects. The FFPO follows a similar process as the NEA in conducting scoping, setting the terms of reference, preparation of EA, review of EA and public consultation and disclosure. The decision of project approval or disapproval is finally granted by the Director of the Department of Wildlife Conservation.

39. **Applicability of FFPO to HSEP.** None of the HCFs are located near areas protected under the FFPO, hence its provisions do not apply.

40. **The Soil Conservation Act of No. 25 of 1951.** The harmful effects of rainfall can be identified as flooding, soil erosion, siltation, salinization and water logging. The Soil Conservation Act No. 25 of'1951 provides for measures to prevent and mitigate soil erosion and for the protection of lands against damage caused by floods and droughts. It is the duty of the Director of Agriculture to investigate the nature and possible extent of soil erosion and the damage of lands and to enforce soil conservation measures to prevent them and is applicable to areas located at an altitude more than 300m.

41. **Applicability of FFPO to HSEP.** 3 of the 4 provinces in the project area has mountainous terrain and the potential for soil erosion and earth slips could be high. Hence, all civil work designs as well as construction practices need to take into consideration the need to conserve soil onsite.

42. **The Antiquities Ordinance No 9 of 1940.** The Antiquities Ordinance (AO) prohibits any activity within declared archaeological reserves. If a certain development activity has the potential to cause structural or non-structural damage to an archaeological resource clearance from with the Department of Archaeology must be obtained and if required, the Director of the Department could request for an Archaeological Impact Assessment before clearance is granted.

43. **Applicability of AO to HSEP.** None of the areas are in declared archaeological areas, hence no clearances are required.

44. **The Agrarian Development Act No 46 of 2000.** The Agrarian Development (ADA) prohibits any filling of paddy land for development without the written permission of the Commissioner General of Agrarian Services.

45. **Applicability of ADA to HSEP.** None of the work will involve filling of paddy fields as all identified civil works will be carried out within existing premises of the HCF.

46. **Disaster Management Act.** Under the Disaster Management Act, construction in identified land slide hazard areas will require approval from the National Building Research Organization.

47. **Applicability of FFPO to HSEP. C**onstruction in places like Nuwera Eliya and Kegalle will require an approval of the building plan from the NBRO.

48. In addition to the above, approval from the local authority is required for all new construction.

D. Safeguard Requirements of ADB

49. All projects funded by ADB must comply with the SPS (2009). The SPS includes operational policies that seek to avoid, minimize, or mitigate adverse environmental and social impacts, including protecting the rights of those likely to be affected or marginalized by the development process. It sets out the policy objectives, scope and triggers, and principles for three key safeguard areas: (i) environmental, (ii) involuntary resettlement, and (iii) indigenous peoples. All three safeguard policies involve a structured process of impact assessment, planning, and mitigation to address the adverse effects of projects throughout the project cycle. The safeguard policies require that impacts are identified and assessed early in the project cycle, plans to avoid, minimize, mitigate, or compensate for the potential adverse impacts are developed and implemented and affected people are informed and consulted during project preparation and implementation. A basic principle of the three existing safeguard policies is that implementation

of the provisions of the policies is the responsibility of the borrower/client. Borrowers/clients are required to undertake social and environmental assessments, carry out consultations with affected people and communities, prepare and implement safeguard plans, monitor the implementation of these plans, and prepare and submit monitoring reports.

50. All projects funded by the ADB are first screened and categorized into one of the following categories in the early stages of project preparation. Screening and categorization is undertaken to (i) reflect the significance of potential impacts or risks that a project might present; (ii) identify the level of assessment and institutional resources required for the safeguard measures; and (iii) determine disclosure requirements.

(i) **Category A**. A proposed project is classified as category A if it is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works. An environmental impact assessment is required.
(ii) **Category B**. A proposed project is classified as category B if its potential adverse environmental impacts are less adverse than those of category A projects. These impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for category A projects. An initial environmental examination is required.
(iii) **Category C**. A proposed project is classified as category C if it is likely to have minimal or no adverse environmental impacts. No environmental assessment is required although environmental implications need to be reviewed.
(iv) **Category FI**. A proposed project is classified as category FI if it involves investment of ADB funds to or through a FI.

51. 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. This IEE is carried out to comply with the safeguards requirements of the ADB's SPS 2009. Rehabilitation works to be funded by the PHC Innovation Fund will also be subject to SPS 2009 even if they may be exempted from national environmental regulations. As explained, according to the national environmental framework of Sri Lanka (as explained and listed in the EARF), none of the interventions envisaged under the project falls into the prescribed category of the National Environmental Act No 47 of 1988 (No 56 1988 and No 53 of 2000) which would require an IEE/EIA. Hence, no government approval and clearances for this IEE or subsequent IEEs prepared by the project would be needed. The government regulatory compliances required by the project relate standards of discharges and emissions from project activities both during construction and operation phases, as highlighted below.

52. Clearances and approvals needed by the project have been provided in the table below.

Table 1: Relevant Clearances and Approvals for the Project

Activity	Relevant legislation	Statutory requirement	Authorizing body
Disposal of Health Care Waste	NEA	EPL/SWL	CEA
Discharge of wastewater effluents	NEA (Protection and Quality) Regulation No. 1 of 1990 published in Gazette Extraordinary No. 595/16 of February, 1990	EPL	CEA

Air emissions	National Environmental (Ambient Air Quality) Regulations, 1994, published in Gazette Extraordinary, No. 850/4 of December 1994 and amendment gazette No. 1562/22 of 2008	EPL	CEA
Disposal of solid waste	National Environmental (Municipal Solid Waste) Regulations, No. 1 of 2009	Approval	CEA
Emission of noise and vibration	National Environmental (Noise Control) Regulations No.1 of 1996 and its amendments	Approval	CEA
Construction on steep slopes in the central province	DMA	Approval	NBRO

53. Apart from the above, none of the other clearances are likely to be required as the infrastructure development proposed under the project will be limited to a modest expansion/upgrade of the existing building footprint/facilities on land owned by the HCF. In a rare scenario, a completely new building could be supported to relocate the OPD functions to a different part of the hospital to be near an ETU.

E. Relevant national health sector policy and legislation for HCWM

54. In 2001, the Government of Sri Lanka drafted a comprehensive national policy on health care waste management. It basically recognizes that Healthcare waste generated by the medical institutions of the public and private sector must be safely handled and disposed of and that HCWM is 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. This policy to date remains a draft and all attempts made in the past for its formal adoption has not been successful.

55. 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 as well as the Ministry of Health it did not receive formal endorsement by the government.

56. 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 high level of hygiene and ongoing management and managerial activities to be carried out in the hospital. The code of practice complements the HCWM guidelines.

57. In 2006, the MOH developed a national color 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 color code identifies 7 specific categories.

58. **Applicability to HSEP.** The policy and national guidelines have not yet been formally adopted by the government, hence no legal requirements are available that makes compliance with the policy and guidelines mandatory. However, these documents remain the main references for HCWM in the country and are followed by the larger HCFs to implement HCWM systems. For

developing HCWM plans under HSEP, the policy and national guidelines will be used to set direction.

V. INSTITUTIONAL FRAMEWORK

A. Environment Sector

59. **Central Environmental Authority.** The Central Environmental Authority (CEA) is the premier national agency that regulates environmental quality from development activity in the country. The CEA has nearly three decades of experience in enforcing the National Environmental Act and operates through a network of regional offices. Over the years it has developed adequate capacity in implementing and supervising the EIA/IEE and EPL processes. However, when it comes to post-EIA post-EPL monitoring, gaps in institutional capacity and resources are noted.

B. Health Sector

60. **Ministry of Health, Nutrition and Indigenous Medicine (MOHNIM).** The MOHNIM is the apex body in the state health sector that plans and manages national health services. The MOHNIM has a Directorate of Environmental and Occupational Health (DE&OH) headed by a Deputy Director General and has a separate budget line in the national health budget. The DE&OH has a staff strength of 39 with capacity for occupational health and safety, food and drug safety, health care waste management, etc. Regarding HCWM, the DE&OH has facilitated 28 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 multi-lateral banks such as the World Bank with similar safeguards requirements as well as by several bi-lateral donors.

61. **Provincial Directorate of Health Services (PDHS) / Regional Directorate of Health Services (RDHS).** None of the PDHSs have a formal program for environment management, HCWM, occupational health or any designated staff for the purpose. The existing capacities to manage HCW between the provinces varies as seen by the difference in status quo regarding HCWM.

62. **Health Care Facilities (HCFs).** The majority of HCFs in the primary sector hospitals and treatment centers do not have designated teams for HCW. The capacity within the primary HCFs in the selected provinces are rather low in terms of HCW and would benefit much from training and capacity building.

VI. DESCRIPTION OF THE ENVIRONMENT (PROJECT AREA)

63. HSEP will be implemented in provinces of Central, North Central, Sabaragamuwa, and Uva. The PHCFs selected for upgrading under the project are scattered across the provinces. This chapter provides a general environmental profile of the selected provinces and a brief description of the selected sites considered under this IEE, paying attention to any environmental or social sensitivity observed, supported by photographs.

A. Central Province

64. **Location and topography.** The central province has land extent of 5,674 km^2 and is in the center of the country which includes the mountainous regions characterized by peaks, valleys, plateaus and steep escarpments. The two main mountain regions are the central massif and the Knuckles range. Kandy, Matale, Dambulla, Nuwera Eliya and Hatton are some of the key towns in the province. The province has three administrative districts, namely Matale, Kandy and Nuwera Eliya.

65. **Climate and Rainfall:** Based on the major climatic zones the districts fall into upcountry wet and dry and mid country intermediate and wet zones. The climate is cool with a rainfall ranging from 5,000 m on the wet slopes to 2,000 mm on the dry slopes, with some areas on the wet western slopes receiving up to 7,000 mm of rain per year. Rainfall pattern of Central Province is influenced by southwest monsoon from May to September when peak rainy season occurs. However, Dambulla, Galewella and Naula areas (dry intermediate zone) of the Matale district receive rain from the North -East monsoon from November to February. The temperatures range from 24°C in Kandy to just 16°C in Nuwara Eliya, which is 1,889 m above sea level.

66. **Hydrology.** Most of the major perennial rivers of Sri Lanka including the Mahaweli and Kelani rivers originate from the central hills located in this province.

67. **Ecology.** The region holds the country's most important watershed areas with high conservation value forests containing high biodiversity and endemism. The forest cover in the districts as reported in the 1991 census 19.5, 44.9 and 30.4 % for Kandy, Matale and Nuwera Elia districts.

68. **Demography.** The total population in the province is 2,423,966 and includes a mixture of Sinhalese, Tamils and Muslims. Many tea plantation workers are Indian Tamils, brought over to Sri Lanka by the British in the 19th century. The population densities for Kandy, Matale and Nuwera Elia are 715, 247 and 414 persons per km^2 respectively. A large majority of the population in Kandy and Matale live in the rural sector while in Nuwera Eliya the 53.2% live in the plantations and 40.9% in villages.

69. **Main economic activities.** As per the Department of Census and Statistics (2012), agriculture is the prominent economic activity employing majority of workforce in Nuwara Eliya

(67.4%) and Matale (43%) districts, while majority of the workforce is employed in services sector (50.5%) in Kandy district. This reflects the economic base of the project districts - Nuwara Eliya being the district predominated by tea gardens and other agricultural activities while Kandy is dominated by tourism related activities. Livestock farming are also popular agricultural activities in the three project districts with Nuwera Eliya district being reputed for dairy cows and yogurt made of diary milk. Comparatively, the proportion of the work force engaged in the industrial sector is less with Kandy recording the highest of 27%. Most of the operating industries in the three districts are related to agriculture processing, dairy and garment manufacturing. In addition, tourism is an established industry in the central province which provides many livelihood opportunities for local and migrant workers.

70. **Major Environmental Issues and Natural Disaster.** Landslides are the biggest threat of natural disasters in the province. Based on the landslide hazardous zoning maps of National Building Research Organization (NBRO), some of the areas in Matale, Kandy and Nuwera Eliya districts have been identified as landslide prone areas and declared as unsuitable for settlement or development activities. Given the predominantly hilly terrain of the province, flash floods are experienced in some areas, however flooding is not a major threat. Deforestations with adverse consequences such as soil erosion and land degradation are one of the main issues in the region. Forests in the central province have come under much pressure to make way for agricultural land and plantations and to provide fuel and timber. Sri Lanka is one of the largest exporters of tea and the land required for tea plantations is substantial. Another key issue is the application of inorganic chemicals in the agricultural and plantation fields which eventually is washed off to the rivers and their tributaries causing much water and soil quality deterioration.

Table 2: Description of location and surrounding land-use for Healthcare Facilities strengthened in the Kandy district under the current package

Kandy	
Madulkelle DH (B) 	This hospital is located by the side of the Madulkelle – Habaragala road. The terrain is hilly and slopes into a valley beyond the road (hospital and other structures are located on the slope). The land within the hospital is sloping and the buildings are in terraced levels. The land use in the immediate surrounding is built and has several shops and houses. Soil erosion and minor landslides could be potential threats based on the topography.
Galaha DH (C) 	The hospital is located about 500-750 m away from the Galaha town (about 19 Km from Kandy city) on the Delthota waththa road off B364. The land in the general area is hilly and has mixed development with largely rural features. The land in the hospital is flat and large with ample space for expansion and storage of material. Soil erosion could be a potential threat during construction.
Delthota DH (B)	The DH is located about 250 m from the small rural township of Delthota. The terrain is hilly with deep valleys and the land-use in the surrounding consists of built up area with mixed development interspersed with smallholder tea gardens and overgrown bare land. Soil erosion and minor landslides could be potential threats based on the topography.

	
Dolosbage DH (C) 	The DH is located by the side of the Nawalapitiya – Dolosbage road. The terrain is hilly with mild to steep slopes. Land use in the surrounding are similar to other DHs described above – rural landscape with low building density and small-scale tea gardens interspersed. Soil erosion and minor landslides could be potential threats based on the topography.
Hataraliyadda DH (C) 	The DH is located by the side of the main Galagedera – Rabukkana road. The terrain and land use in the area is similar to descriptions above with slightly higher building densities.

Table 3: Description of Location and Surrounding Land-Use for Healthcare Facilities Strengthened in the Matale District under the Current Package

Matale	
Kimbissa DH (C) 	The DH is located by the side of the Inamaluwa – Sigiriya road. The terrain is flat and the land use in the surrounding is typical rural township with mixed development and moderate building densities. There are a couple of village tanks in the area and paddy fields nearby. No major environmental sensitivities are noted.
Kalundawa PMCU	Kalundawa is about 10 km from the Dambulla town and is predominantly agricultural landscape. The PMCU is in a typical rural setting with village dwellings, homesteads and paddy in the general area.
Madawala Ulpatha PMCU	Madawala is located about 65 Km from Dambulla on the Jaffna-Kandy highway. The terrain is slightly undulating, and the land use shows a pre-dominantly mixed development especially along the road corridor. The land of the PMCU is flat and there is ample space for the proposed development.
Galewela DH (B) 	This DH is in Galewela town on the Kandy road. The terrain is flat and the land-use in the immediate surroundings of the hospital is predominantly built mixed with commercial activity. Paddy fields are also seen in the background. No major environmental sensitivities are noted there is ample space for the proposed development.

Table 4: Description of Location and Surrounding Land-Use for Healthcare Facilities Strengthened in the Nuwera Eliya District under the Current Package

Nuwera Eliya	
Nanu Oya PMCU 	Nanu Oya PMCU is in Nanu Oya town which is one of the main towns in the district. The terrain of the area is hilly, and the land-use is predominantly built interspersed with tea plantations. Soil erosion and minor landslides could be potential threats based on the topography.

Pundalu Oua PMCU 	The PMCU is located by the side of the Talawatenna – Talawakele main road. The terrain of the area is hilly, and the land-use is predominantly built interspersed with tea plantations. Soil erosion and minor landslides could be potential threats based on the topography.
Lindula DH (B) 	The DH is located on the Agarapahana road. The terrain of the area is hilly, and the land-use is predominantly tea plantations with built areas along the corridor of the road. There is a surface warer stream about 300 m from the site. Soil erosion and minor landslides could be potential threats based on the topography. No other major environmental sensitivities have been noted.
Laxapana DH (C) 	The hospital is in a rural landscape with low to moderate building densities along the road corridor. The area receives high rainfall and has a wet tropical climate and thick vegetation. Given hilly terrain soil erosion could be an issue but other than that no major environmental issues are for seen.
Katanga DH (B) 	The DH is located by the side of the main Colombo-Hatton main road about 250 m away from the Kotagala town. Although the general terrain of the area is hilly and predominant with tea plantations, the hospital is located on flat land. No major environmental sensitivities have been noted.

B. Uva Province

a. Overview

71. **Location:** Uva province consists of the Badulla and Moneragala administrative districts with a land area of 8500 km2. The Badulla district is located towards the East of the Central highlands. Physiographic ally, it is a complex region with mountain ranges, plateaus and narrow valleys covering a greater proportion of the district. The mountain ranges within the district rises to an elevation of 1200–1800m. Overall, the general gradient of a large part of the district is northwards to the valley of the Mahaweli Ganga. Monaragala district lies in the middle of the southeast quadrant of Sri Lanka. Topographically, it is in a transitional zone form central highlands to flat lowland and is characterized by terrains that vary between highly mountainous, undulating and flat.

72. **Climate and Rainfall:** A large section of the Badulla district belongs to the intermediate zone of the countrywith an average annual rainfall around 2000 mm and an average annual temperature that varies between 20-25^{o}C. Drought is an important climatic characteristic in Badulla. Partial drought occurs very often during the months of February to July. On the other hand, Monaragala district belongs to the dry zone of Sri Lanka with an average rainfall that varies between 1300- 1800 mm per year and a daily mean temperature that varies between 22-29^{o}C. Over 84% of rain is received during the seven months of October to January and March to May inclusive.

73. **Hydrology:** Several important river basins in the country drain the Uva province. Several head streams of Mahaweli, Walawe, Menik, Krindi, Kumbukkan and Gal Oya rise in the mountain ranges within Badulla district and then flow North, South and Eastwards across the district. In addition, the district is also drained by other key rivers such as Uma Oya, Badullu Oya and Loggal Oya that dissect the landscape. There are seven river basins, which drain the Monaragala district. These Rivers originate in the West central highlands and flow towards East, Southeast and South - HedaOya, KubukkanOya, WilaOya, Menik Ganga, KirindiOya Malala Oya and Walawe Ganga are the main rivers that run through Monaragala.

74. **Ecology and Forest Cover:** Natural vegetation of the district consists of wet zone forests, intermediate zone forests, scrublands and grasslands. The forest area covers about 19.6 % of the land in the district where Montane, Sub Montane, Moist Monsoon and Dry Monsoon type of forests occur. The district also has vast areas of dry pathana grasslands, especially in the crests and upper slopes of hills in Passara, Ella, Haldummulla and Migahakivula and scrublands that are concentrated predominantly in Mahiyangana and Ridimahaliyadda area. Hakgala Mipilimana Forest Reserve, Ravana Ella Sanctuary, Thangamale Sanctuary and Haputale Forest Reserve are some of the protected areas within the district. Part of the Maduruoya National Park also lies towards the Eastern border of the district which has important Elephant habitats distributed in the area.

75. **Natural reserves and forests.** In Monaragala, a considerable extent of land is under natural reserves and forest. Natural forests under National Parks and or Sanctuaries, which are not available for human settlements, cover approximately a third of total land area in the district and another 25 % of land is under different types of grasslands. The forest cover, which is described as tropical, dry, evergreen, mixed forest and is mainly a secondary climax developed after a long period of earlier civilization based on irrigated agriculture. The savanna in West and North-western area of the district (Bible, Midgame and Medulla areas) is well known for their medicinal trees in upper strata. The grasslands are found in Southern dry areas (Batali and Thanamalwila divisions), bordering forest areas, and they are locally known as “Dry Pathana”. Four National Parks (Yala, Galoya, UdaWalawe and Lunugamvehera), few Sanctuaries and number of Wildlife Corridors and Forest Reserves (Lunugamvehera-Udawalawe, SellakaOya Sanctuary, Yala-Lahugala, Bakinigahawela FR, Daragoda FR, NF, and Bibilehela FR) are located within the district. Gal Oya National Park located South-East of the country in the Eastern and Uva provinces.

76. **Demography.** The population within the province is 1,259,800 representing all ethnic and the religious group in the country.

77. **Economic activity.** The main economic drivers of the province are agriculture and livestock. Upper region of the Badulla district is famous for tea plantation (third largest tea producing district in SL) and vegetable cultivation while the lower region is famous for paddy cultivation although it is grown only in 7.1% of the area. In Monaragala, paddy is the most important agricultural crop grown while other permanent crops such as tea, rubber, coconut and minor crops such as coffee, cocoa and cashew are grown in smallholdings. There are also large-scale sugar cane plantations introduced by the government which has transformed traditional chena and scrub jungles to sugar cane estates. Livestock farming is relatively a significant economic activity in the Monaragala district although it has not been very well developed.

78. **Key environmental Issues and natural disasters.** Deforestation and soil erosion leading to land degradation are two of the key environmental issues in the province and gives rise to a series of other interrelated issues such as earth slips, drying of springs, wells and water courses, and the silting of tanks, rivers and tributaries. Agricultural practices such as chena and tobacco cultivation on steep slopes in Badulla has caused severe land degradation caused by soil erosion and the prolonged use of pesticides in tea and other plantation fields is believed to have caused much soil and water contamination. In Monaragala, chena cultivation is a key contributory factor to the most widespread type of soil erosion. The district also faces a serious human-elephant conflict especially with the introduction of sugar cane plantations.

79. Badulla is classified as a district with multiple disaster risks including landslides, drought, flash floods and forest fires. One of the key reasons for landslides in the district is rampant

deforestation coupled with poor soil management practices in the tea plantations that has led to soil instability and landslides. Badulla, Bandarawela, Haputale, Kandaketiya, Migahakivula, Passara, Soranatota, Uva, Paranagama and Welimada have been identified as areas particularly vulnerable to landslides. As per drought hazard mapping done in the early 2000s it was indicated that the Badulla District is the second district among the main districts susceptible to droughts as well, during the dry periods. As for Monaragala, the biggest threat from natural disaster comes from droughts. A look at the seasonal distribution shows that droughts in Monaragala occur largely in the month of August.

b. Healthcare facilities supported by HSEP in Badulla and Monaragala Districts

80. While the section above provides a general physical and environmental profile of the provinces, the tables below attempt to describe key features of the physical environment and any environmental sensitivity of the sites of the primary care health facilities selected under this package for renovations.

Table 4: Description of Location and Surrounding Land-Use for Healthcare Facilities Strengthened in the Badulla District under the Current Package

Badulla	
Kandaketiya DH (B)	The DH is located by the side of the main road near the small township of Kandeketiya. The land belonging to the DH is a large 25 acres and is undulating with moderate slopes. The surrounding land use consists of village residential units and vegetated homesteads with good tree cover. There are no surface waterbodies in the close vicinity or known ecological and archaeological resources. The hospital compound has some large trees on the perimeter of the building footprint and a rear portion covered in a thick tree canopy. No major environmental sensitivities have been noted.
Migahakivula DH (C) 	The DH is located by the side of the main road near the township of Migahakivula. The land belonging to the DH is large and varies from flat to mild slopes. The surrounding land use consists of built up area. There are no surface waterbodies in the close vicinity or known ecological and archaeological resources. The hospital compound has a few large trees interspersed between buildings and in the bare land. Ground water in the areas is affected with high hardness. No major environmental sensitivities have been noted.
Ettampitiya DH (C) 	The DH is located by the side of the main Badulla-Passara road near the township of Ettmapitiya. The land belonging to the DH is large and consists of steep slopes. While the ETU is located at the road level, the OPD is located at a higher elevation. The surrounding land use consists of moderately built up area. There are no surface waterbodies in the close vicinity or known ecological and archaeological resources. Soil erosion and landslides could be a potential threat in the area although there were no obvious signs. No other major environmental sensitivities have been noted.

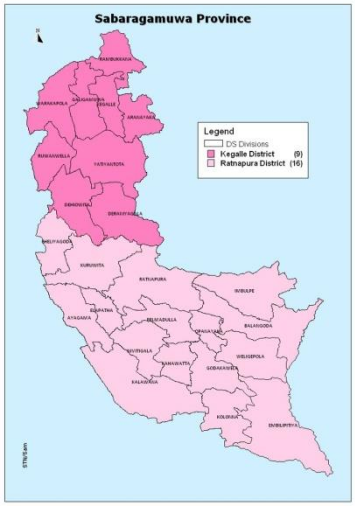
Koslanda DH (B) 	The DH is located by the side of the main Colombo - Ratnapura near the township of Koslanda. The surrounding land use consists of moderately built up area, especially along the road corridor. There are no surface waterbodies in the close vicinity or known ecological and archaeological resources. Soil erosion and landslides could be a potential threat in the area although there were no obvious signs. No other major environmental sensitivities have been noted.
Haldamulla DH (C)	The DH is located by the side of the main Colombo-Haputale main road. The land belonging to the DH is constrained and has little capacity for expansion. The area is hilly with steep slopes and the surrounding land use consists of the road and built up area. There are no surface waterbodies in the close vicinity or known ecological and archaeological resources. Soil erosion and minor landslides could be potential issue given the hilly terrain. No major environmental sensitivities have been noted.

Table 5: Description of Location and Surrounding Land-Use for Healthcare Facilities Strengthened in the Moneragala District under the Current Package

Moneragala	
Dambagalla DH (C) 	The DH is in the rural township of Dambagalla. The land is sprawling and slightly sloping from back to front. Opposite the road a small village lake which is used for irrigation. A small public recreational space has been developed on its bank bordering the road. The hospital is not within a known flood zone or near any ecologically sensitive area. The general land use around the DH consists of moderately built up area mixed with typical rural village landscape.
Deliwa PMCU 	The PMCU is in the village of Deliwa and the surrounding land use consists of the man road, village temple, residential units and homesteads. Topography of the area is flat and no surface water sources within the vicinity of the site are observed. The land extends behind and has enough space for expansion. No Major environmental issues are observed.
Dombagahawela PMCU 	The PMCU is in the rural village of Dombagahawela and the surrounding land use consists of the man road, residential units and homesteads. Population density in the area is low and the topography is flat. No surface water sources within the vicinity of the site are observed. The land extends behind and has enough space for expansion. No Major environmental issues are observed.
Tanamalwila DH (B)	The DH is located close to the town of Tanamalwila by the side of the main road. The area is flat and land use consists mainly of built up area – both residential and commercial. No surface water sources within the vicinity of the site are observed. The land extends behind and has enough space for expansion. No major inherent environmental issues of the site are observed.

	
Hambegamuwa DH (C)	The DH is located close to the village of Hambegamuwa by the side of the main road. The area is flat and land use in the surrounding area is mixed with village infrastructure, homesteads. Paddy fields and village tanks (Hambegama wewa) are observed nearby. The area is flat but the land on which the DH is located is mildly sloping. The land has enough space for expansion. No major inherent environmental issues of the site are observed.

C. Sabaragamuwa Province



a. Overview

81. **Location and topography.** Sabaraganmuwa province consists of the Kegalle and Ratnapura administrative districts spreading over a land area of 4968 Km2.Kegalle district is situated between the central highlands and western southern planes. The altitude of Kegalle varies from 175 m on the western side to more than 300 m on the eastern side. The district of Kegalle exhibits complex topographical features consist of hills and ridges, broad valleys, gorges and plateaus. Kegalle is the main city of the district. Ratnapura district is nestled between the

southern planes and the hill country and has an elevation that varies from 30 m to 2,135 m MSL. Morphologically the Ratnapura district is divided into three distinct regions – lowlands associated with river basins, uplands that rise to a height of 1060 m with a valley and ridge topography and highlands that that rise above 1060 m consisting of plateaus, mountain peaks and escarpments.

82. **Climate and rainfall.** Climatically both districts belong to the low-country wet, mid-country wet and up-country wet zones. The southernmost part of the Ratnapura district falls into mid-country intermediate and low-country dry zone. Kegalle district receives a rainfall over 3000 mm per year where as Ratnapura gets an annual average of about 4000-5000 mm and is the country's wettest district. The mean annual temperature in Kegalle is estimated to be between 22.5^0C to 32.5^0C while in Ratnapura it is estimated to vary between 24^0C to 35^0C.

83. **Hydrology:** The Kegalle district is home to the catchments of Kelani, Ma and Attanagalu rivers of which Kelani drains more than 60% of its land area. The ground water table generally varies from around 10m to 30m and is extensively used for domestic and drinking water needs. No major ground aquifers have been identified in Kegalle and most of the wells run dry in the dry season causing water shortages (in DS divisions such as Kegalle, Warakapola and Galigamuwa) in some areas. The major river catchments in Ratnapura District are Kalu, Walawe, and Gin. The Kalu Ganga catchment is the largest covering almost the entire district while the Walawe Ganga catchment is in the southern part of the district and consists of seasonal streams. Perennial streams are observed in Kalu Ganga catchment as it is located within the wet zone. The mountainous forests in the Central Province and the Sinharaja Forest Reserve are the main sources of water for the river.

84. **Ecology:** The province is home to some of the most diverse ecological landscapes. The forest cover in Kegalle is classified into dense forests, open forests and planted forests which occupy about 9.8% of the total land area. In contrast the forest cover in Ratnapura is about 21% and includes rain forests of Sinharaja and Kithugala.

85. **Demographic status:** A total population of 1,919, 497 reside in the province with a population density of 335 ad 497 persons per Km^2. A large majority of this population lives in rural areas and belongs to all ethnic groups. In Ratnapura 8.9% of the population lives in urban areas while this figure for Kegalle is only 1.8% reflecting the extent of urbanization. Both districts have tea and rubber plantations and hence a significant estate population (9.3 and 6.6% for Ratnapura and Kegalle respectively)

86. **Main economic activity:** Agriculture is the prominent economic activity and is carried out very successfully in these two districts. As per the Department of Census and Statistics (2012), the total population engaged in agriculture in Kegalle and Ratnapura are 18.8% and 43.0% of the total district populations respectively. Tea and rubber are the main agricultural crops in these two districts while coconut, clove, pepper, coffee and cocoa are also grown well in Kegalle district. Paddy lands account for 6% in Kegalle and 7% in Ratnapura. Paddy cultivation faces an uncertain future in Ratnapura district as many farmers are giving up their paddy land and switching to gem mining which is more lucrative. In addition, industries play a main role in the district economies with 27.5% of the total employed in Ratnapura and 35.3% of the total employed in Kegalle engaged in the industrial sector. The mineral extraction is a leading industry in Kegalle where the Bogala graphite is located which is responsible for half of the total mineral exports from Sri Lanka. Tourism is also a key economic sector, especially in Ratnapura with the presence of many tourist attractions such as Sinharaja rain forest and Udawalawe National Park. In Kegalle,

87. **Environmental Issues and natural disasters:** According to the landslide hazard mapping carried out by the National Building Research Organization, both districts carry a high risk of landslides. Landslides are common during the rainy season and cause much damage to life and property. Due to the topography, climate and land use Kegalle district has been identified as the highest risk with significant landslide risk and moderate drought risk. In Ratnapura, flooding is a yearly occurrence caused by the overflowing of the Kalu ganga and its tributaries. The most serious flood since 1948 was experience in May 2003 in Ratnapura Town. In contract, flooding is not as a serious issue in Kegalle where flooding is more localized caused by the spilling of streams.

b. Healthcare facilities supported by HSEP in Kegalle and Ratnapura Districts

88. While the section above provides a general physical and environmental profile of the province, the tables below attempt to describe key features of the physical environment and any environmental sensitivity of the sites of selected for renovations under this package.

Table 6: Description of Location and Surrounding Land-Use for Healthcare Facilities Strengthened in the Kegalle District under the Current Package

Kegalle	
Bolagama PMCU	The Bolaga PMCU is in a typical rural landscape on a slightly undulating land. The surrounding land use consists of village residential units (relatively high density) and vegetated homesteads with good tree cover. Maha oya drains about 500 m downstream of the site. The PMCU is located by the side of the Bolagama – Illukgoda main road. No major environmental sensitivities have been noted.
Hewadivula PMCU	Similar environment to Bolagama
Uyanwatte PMCU 	The Uyanwatte PMCU is located within the village of Uyanwatte south east of the Kegalle town. The surrounding land use consists of densely built up area. There are no surface waterbodies in the close vicinity or known ecological and archaeological resources. Soil erosion and landslides is a potential threat in the site and there were signs of collapsing soil banks behind the facility.
Aranayake DH (A)	Hospital is in close vicinity to the main Aranayake – Mawanella main road in a built-up area. The land is large and relatively flat. In the rear section is doctor's quarters built about 100 years ago by British colonialists. The building is occupied to date. The hospital management is concerned about unhindered movement of wildlife such as Wildboar in and out of the property as there is no perimeter fence.

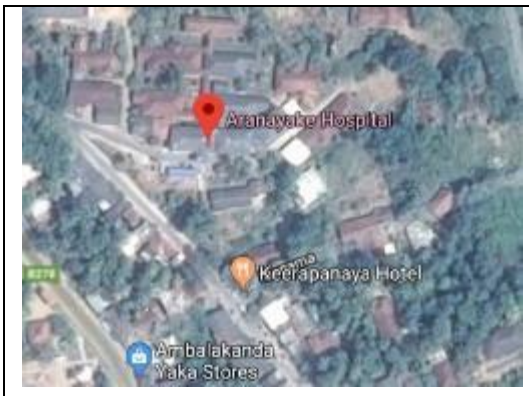
	
Minuwangamuwa PMCU	Minuwangamuwa PMCU is located within the village of Minuwangamuwa south of the Kegalle town. The surrounding land use consists mainly of residences and homesteads. The access road that leads to the PMCU ends there. The land is relatively large and flat with a few large trees in the immediate surroundings of the existing buildings. Soil erosion and landslides could be potential issue in the area although there were no obvious signs of such.

Table 7: Description of location and surrounding land-use for Health Care Facilities strengthened in the Ratnapura district under the current package.

Ratnapura	
Delwela PMCU	The DH is in the rural township of Dambagalla. The land is sprawling and slightly sloping from back to front. Opposite the road a small village lake which is used for irrigation. A small public recreational space has been developed on its bank bordering the road. The hospital is not within a known flood zone or near any ecologically sensitive area. The general land use around the DH consists of moderately built up area mixed with typical rural village landscape.
Andana DH (C)	The PMCU is in the village of Deliwa and the surrounding land use consists of the man road, village temple, residential units and homesteads. Topography of the area is flat and no surface water sources within the vicinity of the site are observed. The land extends behind and has enough space for expansion. No Major environmental issues are observed.
Ranwala DH (C) 	The PMCU is in the rural village of Dombagahawela and the surrounding land use consists of the man road, residential units and homesteads. Population density in the area is low and the topography is flat. No surface water sources within the vicinity of the site are observed. The land extends behind and has enough space for expansion. No Major environmental issues are observed.

Narissa PMCU	The DH is located close to the town of Handapanagala by the side of the main road. The area is flat and land use consists mainly of built up area – both residential and trade. No surface water sources within the vicinity of the site are observed. The land extends behind and has enough space for expansion. No major inherent environmental issues of the site are observed.
Dodampe PMCU	The PMCU is located by the side of the main Ratnapura – Panadura highway. The area is generally flat and land use consists of moderately built up areas in a typical semi-urban environment. There is ample space for expansion and no major issues were observed.

D. North Central Province

a. Overview

89. **Location and topography.** North central province consists of the administrative districts of Anuradhapura and Polonnaruwa covering a land area of 10,475 Km2. Anuradhapura district is situated between the northern most boundary of the central highlands and the dry low country flats of the north. The terrain is predominantly flat with an average altitude of 81m. Polonnaruwa district has very similar topographical features and is situated in the plain valley of the Mahaweli river. The ancient capitals of Anuradhapura and Polonnaruwa are the main cities in each district.

90. **Climate.** Based on major climatic zones of the country, Polonnaruwa and Anuradhapura Districts fall in to low country – dry zone. The province is comparatively dry with an annual average rainfall between 1300 – 1600 mm and average temperatures ranging from 27^0C to 30^0C. The climate of the province is influenced by the North east monsoon from December to February when peak rainy season occurs. The period from May to September is generally dry in the province when water scarcity is common.

91. **Hydrology.** The North Central Province is home to Sri Lanka's ancient hydraulic civilization consisting of intricate irrigation systems. These irrigation systems consist of massive reservoirs including Kala wear, Tisawear, Newerwear, Rajang Ana, Parakrama Samudraya, Minneriya, Giritale, Kaudulla to name some and smaller village tanks that form cascades dotting the land. These tanks and the connecting irrigation canals are major man-made surface water bodies that have provided a life line for sustainable development in the past as water stored in these tanks are channeled in the dry periods for both cultivation and domestic purposes. In addition, Malwathy Oya and Kala Oya that flow to the northwest direction and Yan oya and Ma Oya that flow to the northeast direction are the main natural streams located within the Anuradhapura district. A significant portion of Polonnaruwa district lies within the Mahaweli river basin which is Sri Lanka's longest river with many trans-basin diversions delivering water to the water scarce regions. As such, a complex irrigation system has been established within the province integrated with the ancient irrigation works, distributing water within the entire province to feed the agricultural lands.

92. **Ecology:** Both manmade habitats i.e., home gardens and agricultural lands, inland tanks and channels and natural or semi natural habitats i.e., streams, rivers, scrubland and forest areas enrich the ecology of the province. The many man-made lakes and reservoirs built for irrigation purposes in the past have become thriving natural wetlands providing invaluable ecosystem services to the country. The province also holds several strict nature reserves, nature reserves, national parks and sanctuaries.

93. **Demography.** The total population in the north central province is 1,260,181. Population density of Anuradhapura and Polonnaruwa respectively are 129 and 131 persons per Km^2 and in both districts a very large majority belongs to the rural sector.

94. **Main Economic activities.** Agriculture is the prominent economic activity in the province. As per the Department of Census and Statistics (2013), 58.4% population in Anuradhapura district and 40.4% in Polonnaruwa district are engaged in agricultural sector. Paddy is the main agricultural crops. In addition, livestock farming and inland fisheries are predominant livelihood activities. The large inland reservoirs which are stocked with fingerlings and the availability of large natural grazing lands, tank catchments, scrub and forests, harvested paddy fields etc. create favourable conditions for the two sectors. The industrial sector is not well developed, and most of the operating industries are related to agriculture processing and mineral mining. Since the province is home to an ancient civilization with two UNESCO declared world heritage sites, ancient pagodas and scenic landscapes associated with the inland reservoirs tourism is a key economic activity that provides many employment opportunities to local people.

95. **Archaeological areas.** Anuradhapura and Polonnaruwa are ancient capitals of Sri Lanka and well known for its well-preserved ruins. Both cities are UNESCO world heritage sites. In general excavations for historic sites have been limited to the inner-city areas but it is believed that the two districts have a lot more archaeological resources and historic sites yet to be explored and preserved.

96. **Environmental issues and Natural disasters.** Floods are the most serious natural disaster in Polonnaruwa caused by the overflowing of the Mahaweli river. In 2011, the floods that occurred made many key roads in the district impassable and affected thousands. Anuradhapura is also affected by floods and in 2011 similar catastrophic consequences were experienced. Deforestation in the dry zone is one of the major environmental issues and as a single district Anuradhapura records the highest rates forest cover change of deforestation. The expansion of settlements and agricultural areas has given rise to human-wildlife conflict which is intense in certain areas such as in the Kala Oya basin. The intense agricultural activity in the region using inorganic chemicals has led to serious water quality issues in both surface and groundwater resources which is widely believed to be a reason for the high prevalence of Chronic Kidney Disease of unknown etiology in the North Central Province.

b. Health care facilities supported by HSEP in Polonnaruwa and Anuradhapura Districts

97. While the section above provides a general physical and environmental profile of the province, the tables below attempt to describe key features of the physical environment and any environmental sensitivity of the sites selected for renovations under this package.

Table 8: Description of Location and Surrounding Land-Use for Healthcare Facilities Strengthened in the Polonnaruwa District under the Current Package

Polonnaruwa	
Ellewewa PMCU	The Ellewewa PMCU is located within the rural village of Ellewewa. The land use in the immediate surrounding consists of large government owned property overgrown with grass interspersed with large trees beyond which are sprawling fields of paddy. There is an irrigation canal about 250 m from the site. The land is large and has a groundwater well.
Dammina PMCU 	Dammina PMCU is located about 50-100 m away from a little township by the side of a main road. The land-use in the immediate surrounding consists of bare land with secondary vegetation mixed with large trees, typical of inhabited rural areas. There is a healthy line of large trees on either side of the road. The land is flat and large, and no environmental sensitivities are observed.
Sevenapitiya PMCU 	Sevenapitiya PMCU is in a similar environment to Dammina by the side of a provincial road. The land is flat and large with ample space for expansion. The staff observed that wild elephants roam in the area and sometimes enter the property of the PMCU. There is no perimeter fence right around the property.

Ambagaswewa PMCU 	The PMCU is in the village of Ambagaswewa. The landscape is typically rural, dominated by paddy fields, village tanks and widely scattered homesteads/village dwellings. No environmental sensitivities are observed.
Aranaganwila DH (B) 	This hospital is near the Aralaganwila town, off the main Aralaganwila-Manampitiya-Maduru Oya road. The terrain of the area is flat and the land-use in the immediate surrounding consists of dwelling units, homesteads and secondary vegetation. There are two small village tanks within about 500 m from the site. No environmental sensitivities are observed.

Table 9: Description of location and surrounding land-use for Health Care Facilities strengthened in the Anuradhapura district under the current package.

Anuradhapura	
Horowupotana DH (B) 	The DH is in the rural township Horowupotana by the side of the main Vavuniya – Horowupotana road. The terrain is flat, and the general land use consists of mixed built up zone as the area is part of the Horowupotana town. There are extensive paddy fields in the area and about 250 m behind the hospital is the Horowupotana village tank, no significant environmental sensitivities are observed.
Galenbindunuwewa DH (B) 	This hospital is situated in very similar settings to Horowupotana. About 500 m from the site is the Galenbindunuwewa village tank.
Koonawewa PMCU	The PMCU is in the rural village of Koonawewa and the surrounding land use consists of village dwellings and extensive paddy lands. Population density in the area is low and the topography is flat. No surface water sources within the vicinity of

	the site are observed. The land extends behind and has enough space for expansion. No Major environmental issues are observed.
Medawachchiya DH (A) 	The DH is in the provincial town of Medawachchiya by the side of the main Kandy – Jafna road. The area is flat and land use consists mainly of built up area – both residential and trade – as the site is within the town area. About 500-600 m away from the town is the Medawachchiya Mahawewa and paddy fields. The land extends behind and has enough space for expansion. No major inherent environmental issues of the site are observed.
Negampaha DH (c)	The hospital is located within the village of Negampaha. The landscape is very rural and the land use in the immediate surrounding consists of village dwellings and sprawling homesteads. The land is flat and no significant surface waters are observed in the vicinity. The land has enough space for the proposed expansion and no major inherent environmental issues of the site are observed.

VII. ANTICIPATED ENVIRONMENTAL IMPACTS AND PROPOSED MITIGATON MEASURES

98. This chapter describes anticipated impacts on the environment during preconstruction, construction and operational stages of the project which have been identified using the environmental screening checklist during project preparation. Of the three components of the project only Component 1 is expected to have environmental consequences as components 2 and 3 relate to soft developments.

A. Positive impacts and environmental benefits

99. HSEP will provide better health care services to the poor in the lagging regions of the country by investing in primary health care sector. The outcome would be improved health sector efficiency and cost savings in the health budget through better utilization of primary facilities and reduced burden on the larger hospitals. Improve allocative efficiency in the health sector by optimizing the use of hospital services and improve return on future investment in the hospital sector. Improving both the country's health services and the health status of the population will lead to a reduction in household expenditures and time spent seeking medical care.

B. Negative Environmental Impacts

1. Environmental impacts and mitigation measures during pre-construction

100. Pre-construction activities under the project will largely constitute site clearance and removal of trees if any.

a. Impacts due to collapse of soil banks and landslides

101. As the terrain of the Central and Sabaragamuwa provinces are predominantly hilly and landslide prone, there is a risk of minor landslides and collapse of soil banks occurring if natural slopes are destabilized without adequate care during site preparatory activities under extreme rainfall conditions.

102. The proposed rehabilitation work is restricted to a relatively small expansion of the existing building footprint (approximately 800-900 sq. feet) within hospital owned premises. Out of the sites visited only Uyanwatte in the Kegalle district highlighted an existing risk of collapsing soil banks within hospital premises during rains. However, all other facilities in hilly terrain in Kegalle, Ratnapura, Matale, Kandy and Nuwera Eliya need to practice caution in site clearance to ensure that ground cover, especially on slopes, is not removed unnecessarily.

b. Impacts from removal of full grown trees

103. In a majority of the HCFs visited it was observed that large trees exist beyond the perimeter of the building footprint and hence will not need removal. In the DHs of Attampitiya and Meegahakivula in Badulla district and Hadapanagala in Moneragala district a few large trees would potentially need to be removed to pave way for proposed expansions. However, the exact impact on trees and the total number of large trees that will need to removed can only be assessed once detail designs and site lay outs are available. Most sites are not constrained by space availability within the land, hence site layout should minimize the need to remove fully grown mature trees that provide shade and many other benefits to the hospital environment. Where it is unavoidable, planting of new trees within the hospital compound should be carried out on a 1:2 ratio.

2. Environmental impacts and mitigation measures during construction

104. Construction activities envisaged under the project can be categorized as small-scale with impacts that are localized, temporary in nature and easily manageable with good construction practice. It will involve demolition of the existing OPD area, ground levelling and reconstruction of new OPD (single or double stories) that would typically include larger patient waiting areas, new consultation rooms, dressing rooms, clinic rooms, staff rest rooms, toilets, drug stores, laboratories and dental clinics according to identified requirements of each HCF. The proposed expansion would approximately add about 800 – 900 square feet to the existing building foot print.

a. Impacts on air quality

105. Air quality within the sites will suffer temporarily due to fugitive dust generation from demolition, construction, stockpiling and transporting activities. The impact will be localized but moderate to significant during the period of construction because the hospital is often visited by patients seeking treatment for poor respiratory health. There could be an impact on the neighbourhood as well, however, it is unlikely to be a cause for concern given land blocks are large and houses are spaced out in many of the rural landscapes that the sites are located in. Increase in gaseous emissions such as CO2, NOx, and SO2 from construction machinery and vehicles will be minor to make a serious impact on the air quality.

b. Mitigation measures

(i) The construction site should be fully delineated by a barrier with the dual function of dust/noise containment and safety using Amano sheets, tarpaulin or other suitable material to a maximum height of 7 meters or more.

(ii) The site should be cleaned daily, especially surfaces that are affected by soil and dust.
(iii) Regular watering (at least twice a day during mid-morning and mid evening) should be carried out in the construction site for dust suppression.
(iv) Excavated soil that is temporary stored on site should be covered in tarpaulin or other locally sourced suitable material to prevent from dust particles getting air borne.
(v) Where possible, construction stockpiles and debris piles should be stored away from the functional areas of the hospital. This is possible as a majority of the selected HCFs are in sprawling lands.
(vi) During transportation trucks carrying earth, spoil or construction material to and from the sites should be covered by a tarpaulin.
(vii) Speed controls must be imposed on construction vehicles from about 500 m away from the site.

c. Impact on noise and vibration

106. Noise and vibration are two key impacts that will result from the demolition and construction work, which will be a nuisance to hospital staff, patients and neighbourhood. Major sources of noise are movement of construction vehicles, haulage of material, demolition, concrete mixing and other noise generating activities at the site which, cumulatively, can possibly produce a noise level exceeding 75 db. The elevated noise levels will be a localized and temporary impact that will last throughout the construction period (which will be about 6 months). However, given that the work sites are hospitals and hence sensitive to impacts of noise and vibration, maximum mitigation will need to be taken to keep it under acceptable limits.

d. Mitigation measures

(i) Use of noisy machines should be restricted and where possible noise-reducing means for construction machines should be used.
(ii) 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 neighborhood.
(iii) If certain night time construction activities are unavoidable, it should be done using noise reducing means or low-noise technologies.
(iv) Locate sites for concrete mixing and similar activities away from the hospital facilities. This is possible in most cases given the land areas are large.
(v) If possible, patients at-risk should be moved to a less impacted section of the hospital (in most DHs wards are located away from the OPD area. This issue does not arise in PMCUs).
(vi) Vehicles and equipment used in construction work should meet CEA standards for noise and vibration in Sri Lanka.
(vii) Noisy construction machines/activities (such as pouring concrete for slabs) 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.

107. The primary health care sector has long been under-invested in. As such, it has not seen significant upgrades to physical infrastructure and many of the buildings are aging. Hence some of the existing buildings might be sensitive to construction related vibration and may need close supervision to check for new cracks etc. that would threaten the integrity of old structures.

e. Impacts on soil

108. Impact on soil could occur due to soil erosion, contamination from construction machinery/vehicles and improper management of spoil disposal. These impacts would be general to all sites given similar type of design and construction envisaged.

109. Ground clearance, excavation for foundations, stockpiling of construction material and construction debris etc. are all expected to give rise to increased risk of soil erosion from all sites during wet weather periods. Since the disturbed area is relatively small the impact is not expected to be significant, however, the risk is realistic in areas of hilly terrain and has been particularly noticed in the PMCU site of Uyanwatte in the Kegalle District. It is not significant in flat terrain.

110. Soil contamination may result from the inappropriate transfer, storage and disposal of petroleum products, chemicals such as paint and other hazardous material. As the level of construction envisaged is small scale, this impact will not be significant as use of construction machinery and vehicles will be relatively less.

111. Disposal of spoil (excess earth from cut and fill operations, other demolition debris with fine particles susceptible for washout) can lead to washout of loose soil/particles causing erosion and siltation of drains/waterways. Large scale cutting and filling is not expected under the project and hence the quantity of earth spoil requiring disposal will be very much less. Since the hospital compounds are large, in most cases excess earth can be levelled off on-site. A natural waterway adjacent to the site has been observed in Dambagolla (in Moneragala) and a few sites in the North Central Province. In Bolegama in Kegalle, a large perennial river flows about 500 m from downstream of site and its unlikely any impacts would extend that far.

f. Mitigation measures

(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) On hilly terrain, vulnerable slopes in the disturbed areas should be covered with mulch or plastic sheets fortified with a weight such as sand bags or rocks OR a silt fence should be erected at the base of the slope where it tapers to a drain or road.
(iii) Retention walls shall be constructed on slopes that are vulnerable to giving away prior to commencement of hospital construction work (e.g., Uyanwatte).
(iv) Earth stockpiled onsite should be fully covered on all sides with a suitable material and a 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 drains and in Dambagalla at least 100 m away from the local lake.
(v) Drains leading storm water away from the construction area should be protected with earthen/sand bag berms during wet weather.
(vi) Construction should be scheduled in a way that earth work such as excavations, cut and fill are carried out during the dry period.
(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 dump site.
(ix) Water collection basins and sediment traps shall be installed in areas where construction machinery/equipment (paint brushes) must be washed daily.

g. Impacts on drainage and water stagnation

112. Construction work is commonly known to cause blockages in drains (both natural and man-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 important 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 within construction sites also carry the risk of mosquito breeding.

h. Mitigation measures

(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 storm water flows from the site to outside.
(iii) Lead away drains that collect water from the internal drainage system of the HCF must be kept clean and free from any constrictions to ensure a smooth flow of storm water.
(iv) The construction ground/s should be checked daily (after wet weather) for any signs of water stagnation and cleaned.

i. Impacts due to construction waste water disposal

113. Construction waste water from concrete mixing and equipment washing can potentially pollute water sources, both ground and surface. A large majority of sites considered under this study possess ground water wells which they use for drinking and/or non-drinking purposes. Any contamination that occurs either directly through over-land surface run off during rainfall or indirectly through contaminated soil can lead to the deterioration of this scarce resource. Construction wastewater that ends up in the road side drainage adjacent to hospitals 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 very serious impact, nevertheless requires mitigation.

j. Mitigation measures

(i) A washing area for construction equipment should be delineated within hospital premises away from construction area
(ii) 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.

k. Impacts due to disposal of solid waste debris including Asbestos

114. Demolition and reconstruction of part of the HCF will generate large quantities of solid wastes that will include rubble, pieces of old floor tiles, roof tiles and asbestos cement sheets, used ceramic fittings, wiring, plumbing, empty cement bags, polythene covers, metal items, plastic items, earth mounds and others that require careful management of disposal. Sri Lanka lacks a proper solid waste management system nationally and in these rural areas options may be further limited. The general practice is to open dump in often low-lying lands such as wetlands, paddy fields, stream shores and abandoned land with subsequent environmental consequences. Many

of the HCFs currently use asbestos cement as roofing sheets and this will be a waste that needs extreme care in disposal given its potential to be hazardous if asbestos fibre gets air borne.

l. Mitigation measures

(i) The contractor should prepare a solid waste disposal plan with estimated quantities generated in each category and identify opportunities for re-use, recycle and permanent disposal.
(ii) Rubble from demolished buildings should be disposed of only in areas recommended by the Pradheshiya Sabha and the Engineer.
(iii) There will be no burning of any solid waste on-site
(iv) Excess earth from ground excavations, cut and fill operations should be put to use on-site as much as possible either for backfilling, ground leveling or other. Since most of the lands are large this is not envisaged to be a problem.
(v) Discarded Asbestos sheets should be handled and disposed with extreme care and according to a hazard risk assessment and mitigation plan to be prepared by the PMU. Refer to Annex 3 for guidelines on managing asbestos waste. Some mitigation measures include:

- 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 fiber 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 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 ready by 2019.
- Workers should be given a training on handling AC sheets and be provided with masks and gloves to protect themselves.

m. Impacts due to setting up of labor camps

115. 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. However, basic mitigation measures will be taken in setting up of labour camps.

n. Mitigation measures

(i) Local labor should be recruited as much as possible to minimize social consequences of migrant labor and to provide livelihood opportunities to local community.

(ii) Labor camps should be sited appropriately within the hospital premises but away from the hospital's functional areas with the consent from the hospital management.
(iii) Labor camps should be provided with adequate sanitation facilities and receptacles for garage collection.
(iv) 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.
(v) Discharge and disposal domestic waste from worker camps into water sources should be strictly avoided. Camps should be located at least 100 meters away from groundwater wells where drinking water intakes are located.
(vi) Burying and burning domestic waste in the project sites should also be strictly avoided
i. A good supply of drinking water should be provided to the labor camps.

o. Impacts due to occupational health and safety

116. Occupational health and safety is one of the key risks of the project to be addressed. The risk is not only for construction workers but also for hospital staff and the many patients who visit the hospital daily.

117. Excepting 2 or 3 PMCUs (Narissa in Ratnapura and Hewadivula in Kegalle) within the list of 45 HCFs selected for rehabilitation in the first phase, all other PMCUs and DHs are functioning and visited daily by many out-patients (ranging from 75 – 350 daily) seeking treatment. In addition, clinics are held several days a week/month for a range of issues including NCD, asthma, well-woman, ante-natal, paediatric and psychiatric when many patients in addition to the out-patients use the hospital grounds. All these out-reach, OPD and emergency services will be relocated to a different part of the hospital to continue to serve the local community while the rehabilitation work goes on. Hence, ensuring safety of hospital staff and patients from risks of falling, injury and all other forms of accidents is of paramount importance. Similarly, construction workers' health and safety need to be ensured too.

p. Mitigation measures

(i) Construction site should be delineated from the rest of the hospital preferably using amano metal sheets or any other suitable material that completely cuts off the construction area from the rest of the hospital physically.
(ii) A safe pedestrian pathway to the hospital building or the temporary OPD area should be provided, if regular access is blocked.
(iii) All digging and installing work items that are not accomplished should be isolated and warned of by signposts and flash lamps during nighttime.
(iv) Delineation devices such as cones, lights, tubular markers, barricades tapes, warning signposts, etc. should be erected to inform hospital users about work zones.
(v) Dangerous warning signs should be raised to inform public of dangers and to keep them away from such hazards.
(vi) Appropriate safety equipment, tools and protective clothing should be provided to workers and the contractor must ensure that safe working methods are applied.
(vii) The constructors should carry out suitable training programs on occupational health and safety for workers
(viii) Machinery and equipment that could easily electrocute should be kept safely within the site and always under the supervision of an experienced worker.

(ix) Experienced and well-trained workers should be used for the handling of machinery, equipment and material processing plants.
(x) The contractor should establish his own procedure for receiving, documenting and addressing complaints.
(xi) Notice should be provided to hospital staff and users about the schedule of construction activities with particular hazards such as preparing the concrete slab for multistory buildings.

q. Impacts due to extraction of water for construction purposes

118. Supply of good quality drinking water in adequate quantity was observed to 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 supplier, 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. About 5 HCFs had fixed RO filters gifted by various charities. Most places complained of unreliability of piped connections and poor water quality of ground sources. In DHs such as Andana in Ratnapura it was reported that patients are sent home early due to lack of water even to maintain basic hygiene.

119. 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 will be obtained from the hospital authority or the local authority, as required.

r. Impacts on biological resources

120. None of the facilities are in biologically sensitive areas such as forests, wetlands, protected area, key watersheds etc. The only impact to biological resources will be clearing of ground vegetation and felling of trees to make way for the proposed infrastructure, which has been covered under pre-constructional impacts.

3. Environmental impacts and mitigation measures during operations

a. Generation of HCW

121. The key environmental impact encountered during the operation phase of the project is related to the management of health care wastes. Currently, management of health care waste generated in all the 45 facilities visited is sub-optimal and carry many risks of infection transmission to public health workers as well contamination of the natural environment. The proposed ADB investment will increase the current generation of HCW with improved facilities that aim to promote better utilization of the primary care sector.

122. To assess the risk, it is important understand the type and quantities of HCW generated from each category of HCF.

Table 10: Services Typically Offered and Approximate Average of HCW Produced in Different Categories of PHC Facilities

		HCW		
Type of HCF	**Services Offered**	**Sharps**	**General Infectious Waste**	**General Waste**

PMCU	OPD and clinics Treatment for medical illnesses such as flu, cold cough, hypertension diabetes wound dressings, vaccinations	Varies between > 1 Kg to 2 Kg per month based on vaccination programs	Varies between 250 g to 500 g per day based on patient load	Not estimated
DH (C)	OPD and in medical ward facilities (up to 50 beds), drug stores and dispensary, labor room, ETU, dental clinic	Varies between 2-3 Kg per month	Roughly about 1 Kg a day	Not estimated
DH (B)	OPD and in medical ward facilities (up to 50 -100 beds), drug dispensary, labor room, ETU, dental clinic, laboratory, dental clinic	10 Kg per month	Between 1 – 2 Kg a day	Not estimated
DH (A)	OPD and in medical ward facilities (more than 100 beds), drug dispensary, labor room, ETU, dental clinic, laboratory, dental clinic	250 g per day	2 Kg per day	Not estimated
NOTE 1: The values given above are only **indicative** and has been approximated based on the qualitative survey conducted for 30 PHC facilities. The exact quantities must be calculated based on a waste audit. The amount of waste generated varies widely based on the catchment area drained and the number of OPD patients received per day. NOTE 2: Deliveries are extremely rare in all categories of PMC facilities (on average 2 a month) as patients prefer to go to major hospitals.				

123. Since primary HCFs offer limited health services, do not have surgeries and deliveries are very rare, the types of hazardous HCW categories are limited to sharps and general infectious wastes. Relative to large hospitals that offer secondary and tertiary care to many patients, the amount of hazardous HCW generated from primary HCFs is very small due to low bed occupancy and smaller numbers served. Nevertheless, the risk of accidental disease transmission such as hepatitis and AIDS is high; hence proper management of HCW from its point of generation to disposal is very important.

124. Separating hazardous health care waste from general waste is fundamental to minimizing the quantity of HCW that requires prior treatment and/or special disposal. It is heartening to note that a good attempt is made in all the HCFs to segregate waste according to its hazardous nature. In general, segregation is done into three broadly categories - general waste, general infectious waste and sharps in some sort of colour differentiated bins. However, this segregation is not maintained during disposal where most often mixed waste is bunt behind the hospital either in the open garden, in a pit, cement basin or in abandoned buildings. None of the facilities had any information about the amount of hazardous health care waste generated per day and the quantities were broadly approximated based on how long it takes to fill a bin.

125. The only primary HCF that has treatment equipment and possess an EPL from the CEA is the DHB of Tanamalwila in the Moneragala district. The Moneragala district is the most progressed in terms of HCWM, where much of the infrastructure for waste storage is in place and equipment for waste handling and treatment are either in place or planned to be in place at the end of 2018. Overall, current practices of waste handling and disposal in almost every HCF, excepting to some extent in Tanamalwila, greatly compromises hospital hygiene and safety of

health workers as well as the public. None of the HCFs have a HCWM plan or trained personnel or team with designated responsibilities. Special storage areas for HCW are available only in 4 HCFs in Moneragala, built by the World Bank funded HSDP II. Others do not have storage space and hence burning is done daily. Personal protective equipment is hardly worn by health workers who hand carry waste bins daily to the disposal site.

126. In addition to the solid waste, liquid health care waste from the laboratory is often discharged to a soakage pit. In Haldamulla, it was highlighted that lab waste flows in common storm water drains posing serious risks to hospital hygiene and infection control. Deliveries are rare in DHs as patients prefer to go to base hospitals or higher facilities, but when they do placentas are buried in lined/unlined pits.

127. Some HCFs have reported that plastics refuse such as saline bottles and used syringes are collected and sent for recycling. Recycling ‘used’ syringes pose a very serious threat if they are not sterilized after usage, especially if the needle has not been discarded. Discarded syringes that are intact can also be re-used by people. This has been identified by the WHO as the most serious threat for the spread of infections such as Hepatitis and HIV. Therefore, collectors of plastic items, workers in the factory and the public face a grave risk from untreated syringes that are improperly discarded or put to secondary use.

128. The current practices regarding handling, storage and disposal of hazardous HCW in each of the provinces are summarized in the tables below. Refer to Annex 2 for more details on each facility and Annex 3 for pictures.

Table 11: HCW Handling and Disposal Practices in the Uva Province

Name	Type	Avg In/out patients	Segregation	Transport	Storage space	Disposal
Badulla District						
Kandaketiya	DH (B)	51 beds (31 %, bed occupancy level); **OPD**: 200 to 250 a day	Yes Color coded bins	Hand carried	No	Locally made incinerator
Migahakivula	DH (B)	58 beds (40 %); **OPD**: 350 a day	Yes, limited color-coded bins	Hand carried	Small room	Open burnt in a toilet pit, plastics/glass resold
Ettampitiya	DH (C)	19 beds (75 %); **OPD**: 150 a day	Yes, limited color-coded bins	Hand carried	No	Open burnt
Haldamulla	DH (C)	**In**: 59 beds (40 %); **OPD**: 150 a day, max 300	Yes, limited color-coded bins	Hand carried	No	Open burnt behind hospital. Plastics resold, sputum swabs in toilet pit Lab/dental – separate pit
Moneragala District						
Dambagalla	DH(C)	**In**: 50 beds (30 % occupancy) **OPD**: 150-200 a day	Yes, into color coded bins	Waste cart	Yes	Burnt in a cement barrel. Sharps - destroyed in needle burners 50 L autoclave planned for 2018
Deliwa	PMCU	**OPD:** 60/65 a day	Sharps only into sharp bins	Hand carried	No	Sharps sent to municipal waste; others open burnt
Dombagahawela	PMCU	**OPD:** 100/150 a day	Sharps only into sharp bin	Waste cart	No	Open brunt mixed with garden waste. 35 L autoclaved planned for 2018
Handapanagala	DH (C)	**No wards** **OPD**: 250-300 a day	Sharps only into sharp bins	Waste cart	Yes	Burnt in common pit 35 L autoclave and needle burners planned for 2018
Tanamalwila	DH (B)	56 beds (30 % occupancy) **OPD**: 250 a day	Yes, into color coded bins	Waste cart	Yes	Autoclaved and open bunt. Needles are destroyed in needle burners. **EPL obtained.**
Hambegama	DH (C)	30 beds (28 % occupancy) **OPD**: 200 a day	Yes, into color coded bins	Waste cart	Yes	Open burnt including plastics 35 L autoclave planned for 2018

Table 12: HCW Handling and Disposal Practices in the Sabaragamuwa Province

Kegalle District						
Name	**Type**	**Avg In/out patients**	**Segregation**	**Transport**	**Storage space**	**Disposal**
Balarama	PMCU	**OPD**: 60 a day	Yes, but not into color-coded bins	Hand carried	No	Open burnt in pit
Hewadivula	PMCU	Operates only on clinic days	Sharps collected into sharp bins	Hand carried	No	Sent to MOH where it is open burnt
Uyanwatte	PMCU	**OPD**: 50 a day, on clinic days up to 300 which is twice a month	No	Hand carried	No	Open burnt as mixed waste
Aranayake	DH (A)	**82** beds (40 %); **OPD**: 500	Sharps only, color coded bins are provided but not used effectively	Hand carried	No	Open burnt behind hospital.
Minuwangamuwa	PMCU	**OPD:** 150-200 a day	Yes	Hand carried	No	Sharps sent to MOH, rest open burnt onsite
Ratnapura District						
Delwela	PMCU	**OPD**: 75 a day	Yes, no color-coded bins	Hand carried	No	Buried or open burnt
Andana	DH (C)	28 beds (25-30%) **OPD:** 150 a day	Yes, no color-coded bins	Hand carried	No	Open burnt
Ranwala	DH (C)	32 beds (40%) **OPD:** 100 a day	Yes, no color-coded bins	Hand carried	No	Sharps – taken to Balangoda BH for incineration Other waste open burnt
Narissa	PMCU	Not functional yet as it was closed down a few years back.				
Dodampe	PMCU	**OPD**: 80 a day On clinic days (twice a week) 100/115	Yes, no color-coded bins	Hand carried	No	Open burnt**.**

Table 13: Summary of HCW Handling and Disposal Practices in the North Central Province

Polonnaruwa District						
Name	**Type**	**Avg In/out patients**	**Segregation**	**Transport**	**Storage space**	**Disposal**
Ellewewa	PMCU	**OPD**: 150 a day	Yes, into a color-coded bin set	Hand carried	No	Open burnt
Damminna	PMCU	**OPD**: 100 a day	Yes	Hand carried	No	Open burnt
Sevenapitiya	PMCU	**OPD**: 100 a day	Yes	Hand carried	No	Open burnt in a nearby forest
Ambagaswewa	PMCU	**OPD**: 100 a day	yes	Hand carried	No	Open burnt
Aranaganwila	DH (B)	Beds 72 (40%) **OPD:** 50 a day	Yes	Hand carried	No	Open burnt as mixed waste

Table 14: Summary of HCW handling and disposal practices in the Central Province

Kandy District						
Name	**Type**	**Avg In/out patients**	**Segregation**	**Transport**	**Storage space**	**Disposal**
Galaha	DH (C)	Beds 33 (15%) **OPD:** 200 a day	Yes, to an extent	Hand carried	No	Open burnt
Delthota	DH (B)	Beds 64 (30%) **OPD: 250** a day	Yes, to an extent	Hand carried	No	Open burnt
Hataraliyadda	DH (B)	Beds 55 (50%) **OPD: 1**50-200 a day	Yes, to an extent	Hand carried	No	Open burnt

b. Mitigation measures

129. It is imperative that each of the 45 HCF develops its own HCWM plan in close consultation with the regional health services that will eventually contribute to the regional HCWM plan. The plan must address:

(i) An estimation of the quantities of hazardous and non-hazardous HCW generated at the facility.

- Estimation of the quantities of different waste categories generated should be done through a waste audit. This is an important first step in setting up an effective HCWM plan. With clear guidelines the staff of the HCF can be trained to carry out the audit and document the data.

(ii) Clear procedures for the segregation, handling, collection, internal transportation, storage, treatment and final disposal of hazardous HCW.
(iii) Standardized waste collection time tables from each ward and department.
(iv) A budget for implementing the HCWM plan.
(v) Strategy for raising awareness among hospital staff about risks associated with HCW.
(vi) Training and capacity building program for health workers on HCWM.

130. Treatment and disposal are two of the most critical stages in the HCW management cycle. Several considerations are involved in the final selection of treatment and disposal method including availability of financial allocations, availability of technical backstopping services in the region, installed yet underutilized treatment capacity in the region/district, etc. Opportunities to gain economies of scale in meeting treatment as well as maintenance costs must be strongly considered.

131. None of the provinces have a provincial HCWM plan that envisages the strategy for treatment and disposal at the regional scale. For treatment and disposal of HCW produced by each HCF, two key options are available.

(i) Developing a stand-alone treatment/disposal system for each individual HCF
(ii) Developing a cluster operation where HCW from smaller facilities are drained into a central location (base hospital or higher) where there is already installed treatment capacity. In this case dedicated vehicles that is fully leak proof is required.

132. Except for Moneragala district, all other districts plan to drain HCW from PCMUs and DHs to the closest base or general hospital that has a treatment system already installed. A summary of the available treatment capacity at the province level is highlighted in the table below. Further assessments and discussions with hospital management and the regional directorate of health services are required before the final disposal plan for each facility is agreed upon.

Table 15: HCW Treatment/Disposal Capacity Already Installed in the 9 Districts

Province	HCF	Equipment established	Remarks
Uva	Badulla TH	Metamizer	Functioning
		Incinerator	Functioning
	Moneragala GH	Metamizer	Green award winner
	Diyatalawa BH	Incinerator	Functioning
	Haputale BH	Incinerator	Functioning

Province	HCF	Equipment established	Remarks
	Bandarawela BH	Incinerator	Functioning
North Central	Anuradhapura TH	Incinerator	Functioning
	Polonnaruwa GH	Metamizer	Functioning
		Incinerator	Functioning
Sabaragamuwa	Ratnapura	Incinerator Metamizer	Functioning
	Kahawatte	Incinerator	Functioning
	Kegalle	Incinerator	Functioning
	Karawanella	Incinerator	Functioning
Central	Kandy TH	Waste collection and disposal has been contracted out to a company named Sisili Hanaro who operates a 3-chamber incinerator with a capacity of 10 MT per day in the Mulleriyawa Hospital for Mental Health	
	Peradeniya TH		

(i) Provide needle burners to each ward/department in the HCFs so that destruction of sharps (most common reason for injury and accidental disease transmission) can be carried out at the point of generation.
(ii) Construct storage facilities with separate compartments for each category of waste.
(iii) Provide PPEs for health workers to start using immediately.
(iv) Design a structured training program

c. Generation and disposal of healthcare wastewater

133. Health care waste water 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) grey water containing discharge from washing, cooking, bathing, laundering with low potential for pollution. None of the institutions considered here have piped sewerage or wastewater treatment and they are disposed 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 do not have a toilet presently and the proposed upgrades would include toilets for patients and staff separately.

134. 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 greater utilization of the primary sector, especially with septic tanks that are not water tight, 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. In addition, 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.

d. Mitigation measures

(i) Provide sewage and wastewater treatment at least for DH types A and B.
(ii) All new toilets built in other units under the project should be discharged to septic tank/soakage pit system. Siting of the pits should be planned to take into consideration distance to ground water wells and other water sources.

e. Provision of drinking water

135. Some of the HCFs, such as the Uyanwatte PMCU in Kegalle, face much difficulty with sourcing good quality water supply in adequate quantities. A reliable water supply is a must for maintaining basic hygiene and as such it would be necessary for the project to examine the possibility of conducting feasibility studies on alternative water supplies for HCFs where this is a critical issue.

f. Mitigation measures

(i) Support feasibility studies to find alternative sources of water supply, especially to places like Uyanwatte PMCU in Kegalle where the problem is acute.
(ii) Ensure that regular water quality monitoring is carried out to ensure that safe water is delivered to patients, doctors, nurses and others.

VIII. INSTITUTIONAL REQUIRMENTS AND ENVIRONMENTAL MONITORING PLAN

136. The MOHNIM will be the implementing agency and a PMU will be established there. 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.

137. Within the above structure planning, implementation and supervision of environmental safeguards will take place at three levels:

(i) **Ministry of Health, Nutrition and Indigenous Medicine (through the PMU).** The overall responsibility of ensuring compliance with the EMP and monitoring plan will be borne by the PMU. It will be supported by a full-time environmental consultant who will ensure that the EMP provided in this IEE is finalized (based on final layouts and designs) and included in the bid documents, provide awareness and training to the PIU and contractor, monitor EMP implementation, co-ordinate with the respective PIUs, attend to grievances and prepare monitoring repowers as required. He will also be responsible for carrying out a risk assessment and mitigation planning for the removal of AC sheets under the project. Accordingly, the EMP will be updated.

The PMU will also be supported by a consultant specialized in HCW planning and management, which is part of the EMP requirement (detailed TOR in Annex 8). The consulstant will be responsible for: (i) providing training to provincial HCFs in conducting waste audits and preparing HCWM plans; (ii) supervise the audit process and set milestones for the preparation of the HCWM plan and monitor the same; (iii) technically facilitate and guide the discussion on final treatment and disposal option between the HCF, PDHS, and the RDHS; (iv) report to the PMU on issues, challenges and outcomes; and (vi) provide training on the implementation of the HCWM plans. The consultant will report to the Project Director and the environmental specialist at the PMU who will manage the contract on a day to day basis.

(ii) **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 largely be the contractor's responsibility (apart from those provisions relating to technical designs and other specified tasks indicated in the EMPs) and 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.

The EMP to be included in the bid document and the monitoring plan for the project are attached in Annex 4. Please note that the EMP, as stated above, should be validated against the final designs and fine-tuned before it is attached to the bid documents. This final validation will be done by the PMU.

IX. INFORMATION DISCLOSURE, CONSULTATION AND PARTICIPATION

A. Consultation and participation during project preparation

138. During project design and preparation of this IEE, different public and stakeholder involvement processes were used by the PPTA team to gather stakeholder input on sector needs, project design and configuration. A series of consultation workshops were carried out to engage health sector stakeholders in the central, provincial and regional health services in the needs assessment and decision-making process throughout project preparation. A list of people consulted is provided in Annex 7.

139. Along with field assessments carried in preparation of this IEE, the PPTA team carried out public consultation at each of the 45 HCFs with the objective of (i) understanding the viewpoints of hospital staff and public on the need for better primary health care services in the localities, specific upgrades required within the HCF and especially regarding current practices of handling and managing hazardous health care waste and wastewater, as well as challenges faced with regard to the availability of basic services such as supply of potable water and (ii) respond to their concerns and suggestions during the early stages of the project there by reducing any objections towards the project, incorporate any valuable suggestions by the public in to the design in order to reduce any adverse impacts to the environment

140. In addition, the PPTA team consulted key government health administrators in the central, provincial and regional health services as well as in the environmental authority through workshops and individual face to face interviews to seek their views and current central/regional thinking on implementing HCW management systems.

141. The public using the HCFs (both males and females) as well as the hospital management teams have positive attitudes towards the government's plans to focus on the long-neglected primary care sector to improve the basic services available to the local population. They perceived main benefits of the project as (i) savings on travel time and cost for the community, (ii) relieving pressure on the over-burdened higher-level facilities, (iii) improving working conditions for health workers, and (iv) improving facilities and safety of the environment for those who seek OPD treatment.

B. Disclosure of information

142. According to the requirements of ADB's Safeguards Policy Statement (2009), the draft IEE will be disclosed on the ADB website before the Staff Review Meeting (SRM) as well as disclosed locally on the website of the MOHNIM.

X. FINDINGS AND RECOMMENDATIONS

143. The field visits conducted observed that none of the 45 primary health care facilities are located within or adjacent to areas that are ecologically sensitive or environmentally problematic. All facilities studied under this IEE are located within rural townships and villages with surrounding land use characterized by mixed development consisting of residential dwellings and commercial establishments, agricultural activity and bare land with disturbed secondary vegetation. North Central Province and the northern part of the Mutale district in the Central province have a flat terrain and hence potential for soil erosion from ground disturbance is low and the threat of landslides does not exist. However, Uva, Sabaragamuwa and Central provinces that predominantly have a hilly terrain with steep slopes carry a potential risk of landslides and soil erosion and require adequate consideration to be taken in managing construction sites.

144. 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 asbestos cement roofing sheets, construction wastewater and operation of labour camps, (iii) onsite drainage impairment, (iv) soil erosion and potential for minor landslides, and (v) increased risk of occupational health and safety for construction workers, health workers and hospital visitors. All these impacts can be minimized and mitigated with the adequate implementation of the provisions given in the EMP.

145. As documented in the IEE, the current practices of hazardous health care waste management in all the hospitals (except Tanamalwila DH) are totally inadequate and unhygienic. While a good attempt is made at segregating waste according to category at the point of generation, the segregation is not maintained throughout and finally the waste is open burnt. With the increased utilization of primary care facilities, the current generation of health care waste, which is not significant, is bound to increase raising the risks for public health and environment. Therefore, the IEE recommends that:

(i) 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.
(ii) Similarly, sewerage systems for at least the larger facilities such as Divisional Hospitals A and B should be considered a priority.
(iii) Water supply facilities be improved in facilities 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.

146. The EMP and the monitoring plan provided in the Annex are not final as the site layouts and final design details are still being worked out. As such, it is recommended that the EMP and the monitoring plan be updated with package specific information before tender publishing and to include the updated EMP in the bid document.

XI. CONCLUSIONS

147. Findings of the IEE confirm that the positive impacts of the project far outweigh any negative impacts arising out of the proposed civil works and hospital operations. None of the environmental impacts identified are irreversible and widespread, rather they are localized, temporary in nature. With good site management and safety practices, these impacts can be effectively managed. Stakeholder consultations reveal that the demand for better primary health care by the local community is high, who currently face numerous difficulties in incurring significant expenses by having to travel great distances to higher grade hospitals for treatment. As such the project will be a positive step towards providing better health services to the poor communities in the lagging regions of the country as well as prepare the country to face emerging health sector challenges successfully in the coming decades.

ANNEX 1: ENVIRONMENTAL CHECKLIST USED FOR THE SCREENING OF EACH SITE

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 outpatients 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			
▪ Mangrove			

Screening Questions	Yes	No	Remarks
▪ 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?			
▪ 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?			

Screening Questions	Yes	No	Remarks
▪ 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[1]					
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 labeling/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		

[11]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 foetus 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**
	All potentially adverse effects can be classified as general construction related impacts and are mitigatable with known technology. Public concern does not warrant further assessment. Therefore, standalone Environmental Assessment not required, an Environmental Management Plan would suffice		
	Potential adverse impact is significant, hence, standalone Environmental Assessment and Management Plan needed before the project can proceed		
	Potential adverse impact is significant, hence project cannot be justified		
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: CURRENT PRACTICES IN HANDLING AND DISPOSING HEALTHCARE WASTE IN 5 DISTRICTS

Uva Province - Badulla District				
Description	**Kandekatiya**	**Meegahakivula**	**Ettampitiya**	**Haldamulla**
Hospital Type	DH (B)	DH (B)	DH (C)	DH (C)
Beds (occupancy)	51 (30%)	58 (4%)	19 (75%)	59 (40%)
Average outpatients per day	200 -250 a day	350	150 OPD Clinics get 130/150 twice a week	150, max 300
Units	Outpatients' Department (OPD) Emergency Treatment Unit (ETU) Lab, drug stores and dispensary, medical wards, labor room	OPD, medical wards, ETU, lab, drug stores and dispensary, labor room	OPD, ETU, medical wards, drug stores and dispensary, labor room	OPD, medical wards, ETU, Lab, drug stores and dispensary, labor room, dental clinic
HWCM Plan	No	No	No	No
Waste categories and daily generation (rough estimates)	General infectious waste – 5 Kg a day Sharps – 2.5 Kg a month Sputum swabs – quantity not sure	General infectious waste – 2 Kg a day Sharps – 500 g medicine bottles – 3 Kg a day	General infectious waste – 2 Kg a day Sharps – 250 g a day	
Waste segregation	Yes	Yes	Yes	Yes
Color coded bins	Used	Used but limited	Used but limited	One set for the whole facility
Waste transport (internal)	By hand	By hand	By hand	By hand
Storage	No storage	One small room	No storage	No storage
Disposal	Waste is incinerated in a locally made incinerator. Incinerator ash is buried in a pit Placentas are disposed in a pit Saline bottles collected and given for recycling.	Open burnt in an old toilet Placentas are buried in a pit Plastic/glass bottles are collected and resold	Incinerate	Plastics stored for reuse All others – open burnt Placenta – pit Lab/dental – separate pit Sputum – toilet pit
Available equipment (existing and planned)	Locally constructed incinerator Needle burners (2)	None	Locally constructed incinerator	One needle burner
Nearest available HCW treatment equipment	Badulla General Hospital which has an incinerator and metamizer Distance - 13 Km	Mahiyanganaya Base Hospital which has an Autoclave and metamizer Distance - 37 Km	Badulla General Hospital which has an incinerator and metamizer Distance – 16 Km	Diyatalawa Base hospital which has an incinerator. Distance - 10 Km Haputale Base hospital which has an incinerator Distance – 15 Km
Staff responsibilities in HCWM	40 staff, responsibilities not designated	Staff responsibilities not designated	Team assigned	staff, responsibilities not designated
Training	No	No	Limited	No
Sewage	Septic tank/soakage pit	Septic tank/soakage pit	Septic tank/soakage pit	Septic tank/soakage pit

Water supply	NWSDB supply (poor quality) Deep well within hospital land (water samples are checked once in 6 months) 4 RO filters have been installed in the hospital gifted by a charity	Supply from a rural drinking water scheme – water quality is poor with high hardness One RO filter has been installed	Untreated groundwater. Adequate distance is maintained between well and toilet pit.	Treated water supply available but it is unreliable. During water shortages bowser water is obtained.
Roofing material	AC sheets	AC sheets	AC sheets	AC sheets

Uva Province – Moneragala District						
	Dambagalle	**Deliwa**	**Dombagahawela**	**Handapanagala**	**Tanamalwila**	**Hambegama**
Hospital Type	DH (C)	PMCU	PMCU	DH (C)	DH (B)	DH (C)
DS Division	Madulla	Makulla	Siyabalanduwa	Wellawaya	Tanamalwila	Tanamalwila
In beds (occupancy)	50 (30%)			No wards	56 (30%)	30 (28%)
Avg Outpatients a day	150 -200	60/65	100/150	250-300	250	20
Units	OPD, medical wards, drug stores and dispensary, ETU, LR	OPD, drug stores and dispensary	OPD, drug stores and dispensary	OPD, ETU, drug stores and dispensary	OPD, Medical, mini-theatre, ETU, Lab, drug stores and dispensary, LR	OPD, medical wards, ETU, drug stores and dispensary, LR, Dental
HWCMP	No	No	No	No	No	No
Waste cat and daily generation	General infectious waste Sharps (quantities not known)	General infectious waste Sharps – not even a kilo a month	General infectious waste Sharps – 500g a month	General infectious waste Sharps	General infectious waste Sharps – 10 kg a month	General infectious waste Sharps
Waste segregation	Yes	Sharps only	Sharps only	Sharps only	Yes	Yes
Color coded bins	Yes	Yes	Yes, but limited number	Yes	Yes	Yes
Waste transport (internal)	Waste Cart	Hand carry	Waste cart	Waste cart	Waste cart	Waste cart
Storage	Separate storage available (built under WB funded project)	No	No	Separate storage available (built under WB funded project)	Separate storage available (built under WB funded project)	Separate storage available (built under WB funded project)
Disposal	Burnt in a cement barrel Sharps are destroyed in needle burners	Sharps are sent to municipal waste, rest if open burnt	Open burnt mixed with garden waste	Open burnt in common pit	Autoclaved and buried onsite Needles are destroyed in needle burners Placenta are disposed in a water sealed pit **EPL obtained**	Open burnt including plastics Placentas are buried in a pit
Available equipment (existing and planned)	50 l autoclave planned for 2018 6 Needle burners	Waste cart allocated 35 l Autoclave and needle burners allocated	None 35 L autoclave planned	Autoclave planned Needle burner planned		Autoclaved planned for 2018
Nearest available HCW treatment equipment					Moneragala - Meta Hambantit - Incineratot	Ambilipitiya BH Moneragal GH – 70 Km
Waste responsibilities	Staff responsibilities not designated	Staff responsibilities not designated	Staff responsibilities not designated	Staff responsibilities not designated	Nurse in charge is generally in charge but staff responsibilities not formally designated	Staff responsibilities not designated

Training	One nurse trained	No	No	No	No	No
Sewage	Septic tank/soakage pit	No toilet	Septic tank/soakage pit	Septic tank/soakage pit	Septic tank/soakage pit	Septic tank/soakage pit
Water supply	Shallow well and + tube well, water is untreated. Many CKDu patients present in the area	Untreated shall ground water Water is scare in the dry season RO plant is planned to be fixed	Treated rural water supply	Treated water from NWSDB	NWSDB connection	Untreated tube well 2 RO filters
Roofing material	Clay tiles	Clay Tiles	AC sheets	Clay tiles/AC sheets	AC sheets	New construction proposed

Sabaragamuwa Province – Kegalle district					
	Bolagama	**Hewadivula**	**Uyanwatte**	**Aranayake**	**Minuwangamuwa**
Hospital Type	PMCU	PMCU	PMCU	DH (A)	PMCU
Beds (occupancy)				82 (40%)	
Avg Outpatients a day	60	50 (clinic days more)	50 Clinic days 300 (twice a month)	500	150-200
Units	OPD, dispensary and drug store	OPD. Functions only on clinic days once a month.	OPD, dispensary and drug store	OPD, ETU, Medical Wards, Lab, labor room, dispensary and drug store	OPD, dispensary and drug store
HWCMP	No	No	No	No	No
Waste cat and daily generation	General infectious waste – 50/60 g daily Sharps – very little	General infectious waste Sharps	General infectious waste – 50/60 g daily Sharps – about 10 injections per month (hence, very little)	General infectious waste – 2 Kg daily Sharps -250 g Blood samples – 50 ml	General infectious waste – 200 g a day Sharps – less than 1 Kg a month
Waste segregation	Yes	Sharps are collected and sent to MOH	No	Sharps only. Not effective	Yes
Color coded bins	No		No	Limited	No
Waste transport (internal)	Hand carried	Hand carried	Hand carried	Hand carried	Hand carried
Storage	No separate storage	No separate storage	No separate storage	No separate storage	No separate storage
Disposal	Open burnt in a pit behind building	Sharps – sent to MOH and open burnt	Open burnt behind the facility	Open burning behind the facility	Sharps are sent to the MOH; rest open burnt
Available equipment	None		None	None	
Nearest available HCW treatment equipment	Mawanella base hospital – incinerator Distance Kegalle General hospital – incinerator Distance -		Mawanella Base Hospital Distance - 7 Km Kegalle General hospital Distance - 18 Km	Karawanella Base hospital - incinerator Distance – 60 Km Kegalle General hospital Distance – 25 Km	Kegalle General hospital Distance – 6 Km Karawanella base hospital – 30 Km
Waste responsibilities	Staff responsibilities not formally designated		Staff responsibilities not formally designated	Staff responsibilities not formally designated	Staff responsibilities not formally designated
Sewage	Septic tank/soakage pit		Septic tank/soakage pit (3 toilets)	Septic tank/soakage pit	Septic tank/soakage pit
Water supply	Untreated well water.		Treated NWDB line and storage tank. Shortages are experienced. Some days they can't carry	Treated water. During the dry season water is scarce and during the wet season muddy water comes in taps.	Treated NWSDB line. No problem with water availability.

			out wound dressings as water is cut.	Supplemented with untreated groundwater.	
Roofing Material	AC sheets		AC sheets	AC sheets	Clay tiles

Sabaragamuwa Province – Ratnapura District					
	Delwela	**Andana**	**Ranwala**	**Narissa**	**Dodampe**
Hospital Type	PMCU	DH (C), functions like a PMCU	DH (C)	PMCU	PMCU
Beds (occupancy)	-	28 (25-30%)	32 (40%)	-	-
Avg Outpatients a day	75	150	100	Not yet opened. Closed sometime back	80 Clinic days (twice a week) 100/115
Units	OPD, drug store and dispensary	OPD, medical wards, drug store and dispensary	OPD, medical wards, drug store and dispensary		OPD, drug store and dispensary
HWCMP	No	NO	No		No
Waste categories and daily generation (rough estimates)	General infectious waste – 250 g a day Sharps – 2 kg a month	G infectious waste – 250 g a day Sharps – 2 kg a month	General infectious waste – up to 1 Kg a day Sharps – 2 kg a month		General infectious waste – 500 g daily Sharps – less than 1 Kg a day
Waste segregation	Yes	Yes	Yes		Yes
Color coded bins	Not available	Not available	Not available		Not available
Waste transport (internal)	Hand carried	Hand carried	Hand carried		Hand carried
Storage	No separate storage	No separate storage	No separate storage		No separate storage
Disposal	Buried/Open burnt	Open burnt	Sharps – PHI takes to Balangoda BH Others open burnt		Open burnt
Available equipment	None	None	None		None
Nearest available HCW treatment equipment	Ratnapura GH – 25 Km	Ratnapura (45 Km) Balangoda BH (40 Km)	Kahawatte BH – 20 Km Balangoda BH 10 Km	Kahawatte BH – 12 Km	Ratnapura GH (13 Km)
Waste responsibilities	No	No	No		
Training	No	No	No		
Sewage	Soakage pits but the toilet is unused as there is no water supply	Septic tank/soakage pit	Septic tank/soakage pit	Septic tank/soakage pit	Septic tank/soakage pit
Water supply	Untreated community water supply scheme. There are severe water shortages	Raw water from a spring. Its yield varies and when there is no water patients are discharged early.	Untreated well water. PHI tests water periodically.	Untreated ground water. Heavily contaminated with E Coli.	Untreated ground water
Roofing Material	AC sheets	AC sheets	AC sheets	AC sheets	Clay tiles

North Central Province – Polonnaruwa District					
	Ellewewa	**Dammina**	**Sevenapitiya**	**Ambagaswewa**	**Aranaganwila**
Hospital Type	PMCU	PMCU	PMCU	PMCU	DH (B)
Beds (occupancy)	-	-	-	-	72 (40%)
Avg Outpatients a day	150	100	100	100	50
Units	OPD Dispensary and drug stores				OPD, ETU, medical wards, dispensary and drug stores, laboratory, labour room
Waste categories and daily generation	General infectious waste – 5/10 Kg a month Sharps – 1.5 Kg a month	Same	General infectious waste – Sharps – 1 Kg a month	General infectious waste – 5 Kg a month Sharps – 1 Kg a month	General infectious waste and sharps (quantities not given) Blood from lab – 500 ml a day
Waste segregation	Yes	Yes	Yes		Yes
Color coded bins	Limited number available	Limited number available.		No	Limited number available
Waste transport (internal)	Hand carried	Hand carried	Hand carried	Hand carried	Hand carried
Storage	No separate storage	No separate storage	No separate storage	No separate storage	No separate storage
Disposal	Waste is open burnt	Waste is open burnt	Waste is open burnt	Waste is open burnt	Mixed waste is open burnt behind hospital
Available equipment	None	None	None	None	None
Nearest available HCW treatment equipment	Dehiathakandiya base hospital – Incinerator Distance - 20 Km Polonnaruwa General hospital Distance - 38 Km	Polonnaruwa General hospital Distance - 42 Km	Polonnawruwa General Hospital Distance - 22 Km	Polonnawruwa General Hospital Distance Distance – 40 Km	Polonnaruwa GH – 32 Km
Waste responsibilities	No formal responsibilities designated	No formal responsibilities designated	No formal responsibilities designated	No formal responsibilities designated	No formal responsibilities designated
Training in HCWM	No	No	No	No	No
Sewage	Pit system but toilets unusable	Pit system Only one toilet in the facility	Pit system Only one toilet in the facility	Pit system Only one toilet in the facility	Septic tank/soakage pit
Water Supply	Treated rural water supply. High prevalence of CKD	Treated NWSDB supply is available but it is unreliable; therefore, supplemented with untreated ground water	Untreated groundwater	Untreated groundwater	Treated water from a rural scheme. CKD is prevalent
Roofing Material	AC sheets	Clay Tiles	AC sheets		AC sheets

Central Province – Kandy District			
	Galaha	**Delthota**	**Hataraliyadda**
Hospital Type	DH (C)	DH (B)	DH (B)
Beds (occupancy)	33 (10-15%)	4 (30%)	55 (50%)
Avg Outpatients a day	200	250	150-200
Units	OPD, ETU, Drug store and dispensary, Medical wards, Labor room		
Waste categories and daily generation	General infectious waste – 5Kg a month Sharps – 2.5 Kg a month	General infectious waste – 2 Kg a week Sharps – 1 Kg a month	General infectious waste – 1 Kg a day Sharps – 5 Kg a month
Waste segregation	Yes, happens to some extent but not complete.		
Color coded bins	No	No	No
Waste transport (internal)	Hand carried	Hand carried	Hand carried
Storage	No separate storage	No separate storage	No separate storage
Disposal	Waste is open burnt	Waste is open burnt	Waste is open burnt
Available equipment	None	None	None
Nearest available HCW treatment equipment	Rikillagaskada base hospital – Distance - 25 Km Peradeniya Teaching hospital Distance - 25 Km Theldenya BH – 40 Km	Rikillagaskada base hospital –Distance - 10 Km Peradeniya Teaching hospital Distance - 16 Km	Mawanella base hospital - 38 Km
Waste responsibilities	No formal responsibilities designated	No formal responsibilities designated	No formal responsibilities designated
Training in HCWM	No	No	No
Sewage	Pit system but toilets unusable	Pit system	Pit system
Water Supply	Supplied through a LA run rural water supply scheme and a spring, both untreated.	Water is a problem, Supplied through a tube well and a LA run rural water supply scheme. Water is not fully treated.	Ground water (untreated)
Roofing Material	AC sheets	AC sheets	AC sheets

ANNEX 3: 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 (iii) 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, and Meegahakiwula DH)

The following guidelines have been extracted from the Health and Safety Executive (http://www.hse.gov.uk/) which is an independent regulator for safe working environments in the UK and the World Bank-IFC Guidance Note on Asbestos waste handling.

Preparing the work area

- 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, drain pipes, ridge caps etc. Avoid contact with the AC.
- Lower large pieces to the ground. Don't 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
- Put the asbestos waste bag in a clear polyth
- For disposal of the discarded AC sheets;
    - Store the sealed asbestos sheets i transport to a central disposal yard w stored.
    - Transfer to the sanitary landfill at Ar 2019

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 4: ENVIRONMENTAL MANAGEMENT PLAN AND MONITORING PLAN

No	Activity/Env. impact	Mitigation measures	Location	Costs	Implementation responsibility	Monitoring responsibility
	Pre-construction stage					
1	Clearing of vegetation and ground preparation leading to collapse of soils banks and minor landslides	• Work on slopes in areas that are prone to landslides should be approved by the NBRO. • Slope protection measures must be carried out using appropriate engineering and bioengineering measures in combination with drainage improvement measures were appropriate • Designs should incorporate necessary soil retaining and soil conservation structures. • Vegetation removing should be strictly restricted to required areas only. • Where the ground is exposed, especially on slopes, soil covers should be used to ensure rainfall doesn't wash away soil particles.	All facilities in the Uva, Sabaragamuwa and Central provinces. Uyanwatte in Kegalle requires special mention as the land is susceptible to minor landslides.	Includes in civil works	PIU, Design team	Relevant PIUs and the PMU
2	Removal of large trees	• Most sites are not constrained by the availability of space availability; hence the site layout should avoid the need to remove large trees. • On availability of site layouts and detail designs a visit should be made to the site to assess impacts on trees • Permission for removal of trees that exceed 30 cm DBH should be sought by the engineer • Where tree removal is unavoidable, planting of new trees within the hospital compound should be carried out on a 1:2 ratio • Species chosen for replanting should be native varieties and should be at least 2 m tall saplingsand maintained until grown well. • .	All sites In the DHs of Ettampitiya and Meegahakivula in Badulla district and Hadapanagala in Moneragala district a few large trees are likely to impinge on the designs.	Cost of tree removal will be included in cost of civil works. Cost of replanting will depend on specific site needs.	Contractor	PIU, PMU
	Construction stage					
3	Demolition, reconstruction, stockpiling and transport	• The construction site should be fully delineated by a barrier with the dual function of dust/noise containment and safety using Zinc Allum	All sites	To be included in the costs of civil works	Contractor	PIU, PMU

No	Activity/Env. impact	Mitigation measures	Location	Costs	Implementation responsibility	Monitoring responsibility
	leading to air quality deterioration	sheets, tarpaulin or other suitable material to a maximum height of 7 meters or more. • The site should be cleaned daily, especially surfaces that are affected by soil and dust. • Regular watering (at least twice a day during mid-morning and mid evening) should be carried out in the construction site for dust suppression. • Excavated soil that is temporary stored on site should be covered in 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 (if possible downwind of ward/OPD areas). This is possible as a majority of the selected HCFs are in sprawling lands. • During transportation trucks carrying earth, spoil 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.				
4	Demolition, reconstruction, movement of heavy vehicles leading to elevated noise/vibration levels	• 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 neighborhood. • If certain night time construction activities are unavoidable, it should be done using noise reducing means or low-noise technologies. • Locate sites for concrete mixing and similar activities away from the hospital facilities. This	All sites	To be included in the costs of civil works	Contractor	PIU, PMU

No	Activity/Env. impact	Mitigation measures	Location	Costs	Implementation responsibility	Monitoring responsibility
		is possible in most cases given the land areas are large. • If possible, patients at-risk should be moved to a less impacted section of the hospital (in most DHs wards are located away from the OPD area. This issue does not arise in PMCUs) • Vehicles and equipment used in construction work should meet CEA standards for noise and vibration in Sri Lanka. • Noisy construction machines/activities (such as pouring concrete for slabs) should be scheduled to coincide with to non-clinic and non-OPD days/times as much as possible or on days that patient visitation to the facility is minimum. • Conduct a pre-construction crack survey in hospital buildings and closely monitor the appearance of new cracks and possible damage to structures (most are old buildings)				
5	Construction activities and spoil disposal leading to soil erosion and contamination of top soil.	• Removal of vegetation on site should be restricted to the bare minimum and a strip of vegetation (at least 1 m buffer) should be left around the disturbed area. • During hilly terrain excavation, slope stability must be maintained as directed by the Engineer. Soil conservation bunds shall be formed to protect soil erosion and forming of runnels along excavated surface. • Retaining walls shall be constructed on slopes that are vulnerable to bear the surcharge load during and after construction, as directed by the engineer (e.g., Uyanwatte) • Excavated earth stockpiles at site should be firmly covered to protect dust storming during winds and washing off during rains which cause degradation of surrounding environment. They should be stored away from site/road	All sites but particularly relevant in hilly terrain. Particularly noticed in the PMCU site of Uyanwatte where soil erosion is a serious issue presently.	To be included in the costs of civil works	Contractor	PIU, PMU

No	Activity/Env. impact	Mitigation measures	Location	Costs	Implementation responsibility	Monitoring responsibility
		drains and in Dambagalla at least 100 m away from the local lake. • Surface lead away drains from the construction area should not be connected to storm water drains leading to fresh water bodies. • All possible efforts shall be taken to perform earth work during dry weather periods • 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. • 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 dump site.				
6	Ground disturbance, material stockpiling and other construction related work leading to impaired drainage and water stagnation onsite.	• Maintain cross drainage within the site always during construction. Stockpiles and debris must be safely stored away from known drainage paths. • All fine aggregate stockpiles at site should be firmly covered to protect dust storming during winds and washing off during rains which cause degradation of surrounding environment. • Where blockage of drainage is unavoidable, alternative paths must be created to facilitate storm water flows from the site to outside. • Lead away drains that collect water from the internal drainage system of the PHC facility must be kept clean and free from any constrictions to ensure a smooth flow of storm water. • The construction ground/s should be checked daily (after wet weather) for any signs of water stagnation and cleaned.	All sites.	To be included in the costs of civil works	Contractor	PIU, PMU

No	Activity/Env. impact	Mitigation measures	Location	Costs	Implementation responsibility	Monitoring responsibility
7	Construction and cleaning activities discharging wastewater resulting in contamination of ground/surface water sources	• A washing area for construction equipment should be delineated within hospital premises at least 25-30 feet away from ground water wells and a strip of turf should be maintained in between • 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.	All sites.	To be included in the costs of civil works	Contractor	PIU, PMU
8	Construction and demolition activities resulting in significant quantities of solid waste which if improperly disposed can lead to a range of environmental issues	• The contractor should prepare a solid waste disposal plan with estimated quantities generated in each category and identify opportunities for re-use, recycle and permanent disposal. • All construction waste from demolished buildings should be disposed of only in areas recommended by the Pradheshiya Sabha and the Engineer. Such waste shall not be thrown haphazardly within the land which can lead to mosquito breeding sites • There will be no burning of any solid waste on-site • Excess earth from ground excavations, cut and fill operations should be used on-site as much as possible either for backfilling, ground leveling, reinstatement of disposal yards or other. Since most of the lands are large this is not envisaged to be a problem.	All sites.	To be included in the costs of civil works	Contractor	PIU, PMU
9	Demolition of old building structures using asbestos cement sheets as roofing material. Disposing AC sheets without proper care can	• Conduct a hazard risk assessment in relation to the AC sheets that need to be removed and prepare a risk assessment, mitigation and disposal plan. • This plan should be prior approved by ADB before commencing any demolition activities.	Only those sites that use Asbestos Cement for roofing material.			

No	Activity/Env. impact	Mitigation measures	Location	Costs	Implementation responsibility	Monitoring responsibility
	adversely affect public health.	• Some of the mitigatory measures to include in the risk mitigation and disposal plan follows below and are described in Annex 3. • 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 fiber 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 commencement of demolition activities. • Transport should be done carefully with the sheets covered in thick polythene or tarpaulin. • Transport the AC sheets in bulk to Sri Lanka's first licensed sanitary landfill cell in Aruwakkalu once it is ready by 2019. • Workers should be given a training on handling AC sheets and be provided with masks and gloves to protect themselves.				
10	Setting up labor camps	• Local labor should be recruited as much as possible to minimize social consequences of migrant labor and to provide livelihood opportunities to local community. • Labor camps should be sited appropriately within the hospital premises but away from the hospital's functional areas with the consent from the hospital management.	All sites.	To be included in the costs of civil works	Contractor	PIU, PMU

No	Activity/Env. impact	Mitigation measures	Location	Costs	Implementation responsibility	Monitoring responsibility
		• Labor camps should be provided with adequate sanitation facilities and receptacles for garage 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. • Discharge and disposal domestic waste from worker camps into water sources should be strictly avoided. Camps should be located at least 25-30 meters away from groundwater wells where drinking water intakes are located. • Burying and burning domestic waste in the project site should also be strictly avoided • A good supply of drinking water should be provided to the labor camps • All electrified cables use for camp electrification work shall be firmly insulated. • Standard pre-caution for fire protection shall be taken place.				
11	Demolition/construction work, movement of vehicles and presence of construction equipment/machinery posing occupational health and safety threats	• Construction site should be delineated from the rest of the hospital preferably using Zinc Allum metal sheets or any other suitable material that completely cuts off the construction area from the rest of the hospital physically. • A safe pedestrian pathway to the hospital building or the temporary OPD area should be provided, if regular access is blocked. • All digging and installing work items that are not accomplished should be isolated and warned of by signposts and flash lamps during nighttime. • Delineation devices such as cones, lights, tubular markers, barricades tapes, warning signposts, etc. should be erected to inform hospital users about work zones.	All sites except for Nerissa in Ratnapura and Hewadivula in Kegalle which are non-functional currently.	To be included in the costs of civil works	Contractor	PIU, PMU

No	Activity/Env. impact	Mitigation measures	Location	Costs	Implementation responsibility	Monitoring responsibility
		• Dangerous warning signs should be raised to inform public of dangers and to keep them away from such hazards. • Personal Protective Equipment (PPEs), tools and protective clothing should be provided to workers and the contractor must ensure that safe working methods are applied. • The constructors should carry out suitable training programs and regular tool box meetings on occupational health and safety for workers • All electrified cables use for power tools, camp wiring, and any other electrification work should be firmly insulated. • Machinery and equipment that could easily electrocute should be kept safely within the site and always under the supervision of an experienced worker. • Experienced and well-trained workers should be used for the handling of machinery, equipment and material processing plants. • The contractor should establish his own procedure for receiving, documenting and addressing complaints. • Notice should be provided to hospital staff and users about the schedule of construction activities with hazards such as preparing the concrete slab for multi-story buildings.				
12	Extraction of water for construction work and labor camps in water scarce areas resulting in more shortages and potential conflicts with local users	• Assess the availability of an adequate supply of water prior to commencement of construction and ground mobilization. • Where serious issues of water scarcity exist, the contractor must establish his own water supply and storage onsite	All sites.	To be included in the costs of civil works	Contractor	PIU, PMU

No	Activity/Env. impact	Mitigation measures	Location	Costs	Implementation responsibility	Monitoring responsibility
		• Where existing supplies could be used, the contractor shall obtain the necessary consent and approval from the relevant party.				
	Operations stage					
13	Increased generation of hazardous health care waste which is improperly disposed can put public health at risk from accidental infections and contaminate the natural environment.	• Develop a health care waste management plan (HCWMP) for the facility in close consultation with the regional health services that will eventually contribute to the regional HCWM plan. The plan must address; 1. An estimation of the quantities of hazardous and non-hazardous HCW generated at the facility. 2. A waste audit to estimate HCW quantities under different categories must be carried out. This is an important first step in setting up an effective HCWM plan. The staff of the HCF should be trained to carry out the audit and document the data. 3. Clear procedures for the segregation, handling, collection, internal transportation, storage, treatment and final disposal of hazardous HCW. 4. Standardized waste collection time tables from each ward and department. 5. A budget for implementing the HCWM plan. 6. Strategy for raising awareness among hospital staff about risks associated with HCW. 7. Training and capacity building program for health workers on HCWM. • Develop a budget and an implementation plan for the implementation of the HCWM plan and timelines for obtaining the EPL	All sites Tanamalwila DH has already obtained the EPL, hence this hospital will need to only document the process and build staff capacity	Costs will be determined once the HCWM plan is finalized.	Relevant HCF	Environment and Occupational Health Department of the MOHNIM and the relevant PDHS/RDHS with close support from the PIUs/PMU
14	Increased generation of sewage and wastewater from the hospital that	• Provide sewage and wastewater treatment at least for DH types A and B	DH types A and B	Costs will depend on the size and	Relevant HCF for inclusion of a treatment	Environment and Occupational

No	Activity/Env. impact	Mitigation measures	Location	Costs	Implementation responsibility	Monitoring responsibility
	can contaminate ground water with disease causing pathogens, pharmaceutical chemicals, endocrine disrupting chemicals	• All new toilets built in other units under the project should be discharged to septic tank/soakage pit system. Siting of the pits should be planned to take into consideration distance to ground water wells and other water sources.		treatment process	system in the project Contractor for implementation	Health Department of the MOHNIM and relevant PDHS/RDHS with close support from the PIUs/PMU

ANNEX 5: ENVIRONMENTAL MONITORING PLAN

Impact/mitigation	Parameters to be monitored	Location	Measurement	Frequency	Responsibility	Relevant standards
Pre-construction stage						
Minimize the need to remove large mature trees	Final layout plan and detail designs for each site Adherence to EMP	All sites	No of large trees that need felling	Once after designs are completed	PIU/PMU	
Slope protection and soil erosion control in ground clearing	Final layout plan and detail designs for each site	Construction areas of all sites in hilly terrain			PIU/PMU	
	Adherence to EMP		Visual observation	Once a week	Contractor PIU/PMU	
Construction stage						
Minimizing air quality deterioration due to demolition, reconstruction work, stockpiling and movement of heavy vehicles	Adherence to EMP	All construction sites (*Except Narissa and Hewadivula PMCUs*)	Baseline air quality sample Visual observation and at least 2 air quality sampling during construction Feedback from hospital users	Daily Weekly Air quality sample baseline and 2 samples during implementation.	Contractor PIU/PMU	National Environmental (Ambient Air Quality) Regulations, 1994, published in Gazette Extraordinary, No. 850/4 of December 1994 and amendment gazette No. 1562/22 of 2008
Controlling noise and vibration levels due to demolition, reconstruction work and movement of heavy vehicles	Adherence to EMP	All sites (*Except Narissa and Hewadivula PMCUs*)	Visual observation	Daily Weekly	Contractor PIU/PMU	
	Noise and vibration measurements		Noise/vibration levels	Baseline and twice during construction	Contractor	National Environmental (Noise Control) Regulations No.1 of 1996

Impact/mitigation	Parameters to be monitored	Location	Measurement	Frequency	Responsibility	Relevant standards
						and its amendments
Containment of soil erosion and contamination	Adherence to EMP	All sites	Inspection of site for adequacy of soil erosion/contamination control measures, evidence of soil erosion and contamination	Weekly	Contractor PIU/PMU	
Proper disposal of construction waste (non-hazardous)	Adherence to EMP	All sites	Inspection of the site for presence of dumps or waste fires, records of waste removed form site, inspection of disposal sites	Weekly	Contractor PIU/PMU	National Environmental (Municipal Solid Waste) Regulations, No. 1 of 2009
Proper disposal of construction waste (hazardous – discarded asbestos cement waste)	Adherence to EMP	Sites that currently use asbestos cement as roofing sheets	Visual observation of the site for adequacy of measures followed, feedback from contractor team	Weekly	Contractor PIU/PMU	
Control of onsite drainage impairment	Adherence to EMP	All sites	Visual observation and inspection of site for stagnant water, blocked drains etc.	Weekly	Contractor PIU/PMU	
Containment of construction waste water discharge	Adherence to EMP	All sites	Visual observation and inspection of site for open discharge of wastewater and pollution	Weekly	Contractor PIU/PMU	
Pollution from labor camps	Adherence to EMP	All sites	Visual observation and inspection of the labor camps, feedback from construction workers	Weekly	Contractor PIU/PMU	
Occupational health and safety issues	Adherence to EMP	All sites	Visual inspection of the site, adequacy of signage and delineation barriers, number of accidents	Weekly	Contractor PIU/PMU	

Impact/mitigation	Parameters to be monitored	Location	Measurement	Frequency	Responsibility	Relevant standards
			and complaints registered in the GRM,			
Operational phase						
Proper management of hazardous health care waste generated from each facility	Development of a site-specific HCWM plan	All sites (except Tanamalwila DH for waste disposal)	Progress with regard to • Waste audit within the HCF • Waste classification and segregation • Regional strategy for waste disposal • Training plan for hospital staff • Equipment list for safe handling and disposal • Budget for implementation of selected measures • Implementation schedule	Monthly	Hospital MO in charge and RDHS	National Environmental Act – EPL regulations amendment 2008
Proper treatment of hospital sewerage and wastewater	Inclusion of wastewater treatment plant in project scope	All DH A and B		Monthly	Hospital MO in charge and RDHS	NEA (Protection and Quality) Regulation No. 1 of 1990 published in Gazette Extraordinary No. 595/16 of February, 1990

ANNEX 6: PHOTO DOCUMENTATION

Badulla District – Kandekatiya Divisional Hospital B

Badulla District – Haldamulla Divisional Hospital C

MONERAGALA DISTRICT– Dambagalla Divisional Hospital B

MONERAGALA DISTRICT – Haldamulla Divisional Hospital C

POLONNARUWA DISTRICT – Aralaganwila Divisional Hospital B

POLONNARUWA DISTRICT – Damminna PMCU

KEGALLE DISTRICT – Uyanwatte PMCU

KEGALLE DISTRICT – Aranayake Divisional Hospital B

RATNAPURA DISTRICT – Narissa PMCU

RATNAPURA DISTRICT – Ranwala Divisional Hospital C

ANNEX 7: LIST OF PEOPLE MET DURING CONSULTATIONS

Consultation with ADB		
Environmental and Social Safeguards	Dr Bandara, Environmental Specialist, SLRM	16th February 2018
Consultation with MOHNIM		
Meeting with DDG/Directorate of Environment and Occupational Health	Dr Gamlath, DDG - MOHNIM	21st of February 2018
Workshop with provincial and regional health services	PDHS, RDHS, MO planning from all districts and provinces as well as DDG planning from MOHNIM participated.	23rd February 2018
Consultation with Central Environmental Authority		
Department of Hazardous Waste	Mr Sujeewa, Assistant Director	21st of February 2018
Consultations in Moneragala District		
Meeting in Moneragala RDHS office	Dr Adikari, RDHS Dr Dimuthu, MO Planner	March 02nd 2018
Dambagalla DH C	Dr H P Hatharasinghe, MOIC	March 02nd 2018
Deliwa PMCU	D M Dissanayake, Dispenser	March 02nd 2018
Dombagahawela	Dr A M A Gunawardane, MOIC	March 02nd 2018
Handapanagala DH C	Dr Adikari, RDHS	March 02nd 2018
Tanamalwila	Dr Amal Panambalana, DMO	March 02nd 2018
Hambegama		
Consultations in Badulla District		
Kandaketoya DH B	Dr Gayani Perera, MOiC	March 03rd 2018
Meegahakivula DH B	Nurse in Charge	March 03rd 2018
Athampitiya DH C	MOIC	March 03rd 2018
Haldamulla DH C	Dr R Ratnayake, RMO	March 03rd 2018
Consultations in Polonnaruwa District		
Meeting in Polonnaruwa RDHS office	Regional Director & Dr Kumara, MO planner	March 07th 2018
Damminna PMCU	Mr Viraj, Dispenser	March 07th 2018
Dombagahawela PMU	Dispenser, Health workers	March 07th 2018
Sevenapitiya PMCU	Dr M P R Mendis, MO	March 07th 2018
Ellawela PMCU	Dr R M K J Herath, MOIC	March 07th 2018
Aranganwila DH B	Dr Gamunu Wijeratne, MO	
Consultations in Kegalle District		
Bolagama PMCU	Dr Priyani Rajapakse, RMO in Charge	March 08th 2018
Aranayake DH A	Dr Palitha Dissanayake, MO	
Minuwangamuwa PMCU	Ms Marasinghe,Development Officer Ms Shiromi, Health Assistance	March 08th 2018
Uyanwatte PMCU	Dispenser	March 08th 2018
Consultations in Ratnapura District		
Meeting in Ratnapura RDHS office	Dr C Jayawardane. MO Planning	March 09th 2018
Delwala PMCU	Dispenser	March 09th 2018
Andana DH C	MOIC	March 09th 2018
Ranwala DH C	MOIC	March 09th 2018
Narissa PMCU	D S Opanayake, Dispener	March 09th 2018
Dodambe PMCU	Health Assistant	March 09th 2018
Consultations in Kandy District		
PDHS Office	MO Planning	
Galaha DH B	Dr Asela Jayasekera, MOIC	April 19th 2018
Delthota	Dr W I A De Silva, MO	April 19th 2018
Hataraliyadda DH B	Dr Imali Dissanayake, MO	April 19th 2018

ANNEX 8: TOR FOR THE HEALTH CARE WASTE MANAGEMENT SPECIALIST

1. Provide technical training to provincial, district and HCF level staff on the process of preparation of health care waste management plans as per the draft national policy and national guidelines.
2. Provide technical training and written guideline to staff of HCF on conducting waste audits to quantify the volumes of hazardous health waste produced in each facility.
3. Lead technical discussions (together with PMU and necessary technical facilitation such as preparing cost estimates) with the Regional Directorate of Health Services and Provincial Directorate of Health Services on determining the most cost effective treatment and disposal strategies for HCW to be included in the final HCWM plan for each facility (*mainly to determine whether treatment and disposal will be centralized at the district/province level where waste will be transported from PH facilities to base hospitals OR decentralized to HCF level vis a viz the provincial HCW strategy/vision*)
4. Provide technical supervision and backstopping for the HCF level waste audits.
5. Provide technical supervision and backstopping for the preparation of HCWM plans for each HCF funded by the project.
6. Develop a suitable format for the HCWM plan that includes:
   a. Clear procedures for the segregation, handling, collection, internal transportation, storage, treatment and final disposal of hazardous HCW.
   b. Standardized waste collection time tables from each ward and department.
   c. Strategy for raising awareness among hospital staff about risks associated with HCW.
   d. Training and capacity building program for health workers on HCWM.
   e. Determine most economical final treatment and disposal option.
   f. Determination of other equipment required for the implementation of the HCW plan such as needle burners, segregation bins, etc.
   g. Provision of storage facilities with separate compartments for each category of waste.
   h. Provision of PPEs for health workers to start using immediately.
   i. A structured training program.
   j. A budget for implementing the HCWM plan.
7. Review each HCWM plan and provide feedback for finalizing the same.
8. Provide technical training to staff of HCF in implementing the final approved HCWM plans and consultatively develop a monitoring plan to record progress of them on an annual basis.