

Environmental Assessment and Review Framework

September 2021

Sri Lanka: Health System Enhancement Project – Additional Financing

Prepared by Project Management Unit (PMU) of Health System Enhancement Project (HSEP), Ministry of Health for the Asian Development Bank. This is an updated version of the draft originally posted in July 2021 available on <https://www.adb.org/projects/documents/sri-51107-003-earf>.

CURRENCY EQUIVALENTS

(As of 17 August 2021)

Currency unit	–	Sri Lanka Rupee/s (SLR/SLRs)
SLR1.00	=	\$0.00501
\$1.00	=	SLR199.50

ABBREVIATIONS

ADB	–	Asian Development Bank
CEA	–	Central Environmental Authority
EHS	–	environment, health & safety
EMP	–	environmental management plan
EMOP	–	environmental monitoring plan
EPL	–	environmental protection license
GRM	–	grievance redress mechanism
H&SP	–	health and safety plan
HCF	–	healthcare facility
HCW	–	health care waste
HCWM	–	health care waste management
HSEP	–	Health System Enhancement Project
IEE	–	initial environmental examination
MOH	–	Ministry of Health
NEA	–	National Environmental Act
O&M	–	operation and maintenance
PDHS	–	provincial director of health services
PIU	–	project implementation unit
PMCU	–	primary medical care units
PMU	–	project management unit
PPE	–	personal protective equipment
SKS	–	<i>saukya karya sahayaka</i>
SPS	–	Safeguard Policy Statement
SWL	–	scheduled waste license

NOTE{s}

In this report, "\$" refers to United States dollars

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I. INTRODUCTION

A. Overview

1. Ongoing Health System Enhancement Project (HSEP), financed by the Asian Development Bank (ADB) through a concessional loan of \$37.5 million from ADB's ordinary capital resources and a \$12.5 million grant from ADB's special funds resources, was approved on 23 October 2018. The counterpart funding of \$ 10 million (i.e., equivalent to 20% of the ADB allocation) has been allocated for the project, with the aim of improving and expanding the health care services to vulnerable populations with lagging health indicators. The loan and grant became effective on 5 February 2018 and are to be closed on 31 May 2024. The investment is aligned with the Government of Sri Lanka's (the government) 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).

2. The project is being implemented in nine districts covering the provinces of Central, North Central, Sabaragamuwa and Uva which are lagging in health care services.

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

4. Some of the allocations of this project were channelled for responding to the government's request to assist the immediate health care needs that arose due to the ongoing pandemic of the coronavirus disease (COVID-19). A mission from ADB in November 2020 identified that (i) \$15 million financing gap arose following the reallocation of \$10 million and \$5 million from the original loan and grant allocations, respectively, to the emergency COVID-19 response; (ii) \$25 million for project scaling-up; and (iii) \$5 million for the 18-month project extension due to COVID-19. The mission also emphasized that the original ratio of the Government counterpart funding at 20% of the ADB allocation (excluding the COVID-19 reallocation) should be maintained.

5. The original project includes the following 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; and (iii) output 3 - policy development, capacity building, and project management supported.

6. An additional financing has been considered for the ongoing HSEP considering the achievements of the ongoing project; the government's request for scaling-up the project and extension of the project implementation period, as well as further addressing the ongoing third wave of COVID-19 pandemic; and the need to reallocate the funds utilized for immediate response to COVID-19 requirements in 2020.

7. This additional financing shall continue to support in strengthening primary health care (PHC), both primary medical care and preventive health services in Sri Lanka. MOH shall continue as the executing agency for the additional financing of the project, while the PMU and PIUs shall continue to implement the project.

B. Purpose of the Environmental Assessment and Review Framework

8. Projects and programs financed by ADB need to comply with ADB's safeguard policies as detailed in the Safeguards Policy Statement (SPS) of 2009. Therefore, subprojects and components eligible for funding under this project will be required to satisfy the ADB's safeguard policies, in addition to conformity with environmental legislation of the Government of Sri Lanka.

9. This is the updated version of the environmental assessment review framework (EARF) prepared for HSEP.¹ This updated version includes the new scope of work proposed under the additional financing and aims to provide guidance on safeguard screening, assessment, institutional arrangements, and processes to be followed for components of the project, where design takes place after ADB Board approval. The subproject selection will be in accordance with the environmental project selection criteria as outlined in this EARF. This EARF will be used to provide guidance on environmental assessment for the subprojects under the additional financing. MOH will agree with ADB on screening and categorization, environmental assessment, preparation and implementation, monitoring, and reporting.

10. Ongoing HSEP is classified as category B for environment as per ADB SPS. Province-wise initial environmental examination (IEE) reports including environmental management plans (EMPs) were prepared for the subprojects implemented under the ongoing HSEP. A rapid environmental assessment (REA) was carried on each subproject to be implemented under HSEP. Even though the subprojects were classified as C based on the outcome of the REAs, site-specific EMPs were prepared and included in all bid documents and contract documents to ensure environmental safeguards during subproject implementation.

11. It is expected that potential impacts of subprojects to be funded under the additional financing will be similar in nature. Civil works proposed under output 1 of the additional financing proposal include upgrading the nine base hospitals (one in each of the nine districts in the four provinces) through expanding the physical space, repairing hospital facilities, and providing needed medical equipment to enable better secondary curative care services to patients referred from PHC facilities within the respective cluster.

12. Output 2 of the additional financing shall support (i) scaling up selected secondary and tertiary care hospitals' capacity to better manage COVID-19 patients by providing needed emergency medical equipment, expanding access to oxygen, and transport support for home care; (ii) improvement of the quality and access to laboratory testing services by establishing one mobile laboratory in each of the 26 districts across the country and the National Institute of Health Sciences and by supporting the laboratories to carry out tests for COVID-19 detection, surveillance, and management; and (iii) through the grant financed by Japan Fund for Poverty Reduction (JFPR), enhance the efficiency of prehospital ambulance system (1990 Suwaseriya Ambulance System) by linking COVID-19 patients to the defined hospitals for further treatment and management without compromising the non-COVID-19 emergency services. The additional financing for output 3 will scale-up the renovation and refurbishment of infrastructure, information technology systems and e-learning facilities in the National Institute of Health Sciences (NIHS) and nine selected regional training centres (one centre per province) to enable facilitation of pre-service and continuous medical education of health sector staff. An IEE including an EMP has been developed considering the subprojects listed under outputs 1 and 2. The IEE indicates that

¹ This is an updated version of the draft originally posted in July 2018 available in <https://www.adb.org/projects/documents/sri-51107-002-earf>. The EARF is prepared based on the ADB SPS (2009), and the Government of Sri Lanka laws and regulations.

no significant impacts are anticipated for the subprojects and there are no sensitive and protected areas in and around the proposed facilities. Renovation and refurbishment work proposed at NIHS and regional training centres are expected to have minor civil works such as colour washing the buildings and no significant impacts. Any impacts foreseen can be mitigated through proper facility design, setting, high-quality construction, and operations and maintenance practices as documented in the EMPs. Thus, the EARF will support the integration of these measures and practices in the project design and contract documents.

13. All environmental documents will be endorsed and approved by MOH and cleared by ADB

II. DESCRIPTION OF PROJECT

A. Program Impacts and Outcomes

14. Proposed investment in the project will continue to improve the primary and secondary health care management in selected lagging regions of the country, helping Sri Lanka's health system to adapt to emerging challenges and deal with shifting disease burdens.

B. Scope of Civil Work

15. Civil works under the ongoing project is focused mainly on expanding facilities within the Out-Patient's Department (OPD) in primary medical care units (PMcUs), divisional hospitals, and nine apex base hospitals, typically adding between 1,000 square feet to 2,000 square feet to the existing building footprint within the same premises depending on the institution's requirements.

16. The additional financing component of HSEP shall include construction of new building facilities within the nine apex cluster hospitals to accommodate Emergency Treatment Units (ETUs), OPDs, surgical theatres, dental services, eye theatres, and drug stores. These new buildings shall add about 22,600 square meters area of footprint to the existing building facilities in these nine hospitals (by use of multi-story buildings). New sewage treatment plants shall also be constructed in selected hospitals. Renovation and refurbishment of existing buildings of these hospitals shall also be carried out. Such works shall be limited to repair or wards and clinics, improvements to existing corridor systems, and access and color washing. These activities shall not extend beyond the existing footprint of the buildings.

17. Further description of the scope of work proposed for HSEP additional financing is discussed below.

C. Project Components Proposed Under Additional Financing

1. Output 1: Primary health care enhanced in Central, North Central, Sabaragamuwa, and Uva Provinces

a. Proposed activities under additional financing to support output 1

18. For shared care cluster support—base hospital development in nine districts (one per district), the activities are as follows:

- (i) Civil works including:
 - (a) civil works at the nine base hospitals in the nine districts; and
 - (b) sewerage systems renovation and upgrading at eight of the cluster apex

- hospitals;
- (ii) Medical Equipment: medical equipment and furniture to nine base hospitals (cluster apex) in each of the nine district clusters; and package 1 - theatre equipment; and package 2 - physiotherapy equipment; and
- (iii) Operational support to make clusters functional such as: (a) payment of internet connectivity charges across all Provincial Directors of Health Services (PDHSS), Regional Directors of Health Services (RDHSS), and all district health facilities, (b) payment of internet data charges for PHC and cluster-linked staff; (c) management of vehicle hires for establishing a health care waste management (HCWM) arrangements, transporting laboratory specimens within the clusters, establishing travel arrangements for staff working within and across clusters, and carrying out supervision and monitoring and for provision of outreach services by cluster hospital staff; and (d) establishment of cluster-based radiology and mobile laboratory services.

2. Output 2: Health information, disease surveillance capacity and COVID19 response strengthened

b. Proposed activities under Additional Financing to support Output 2

19. The proposed activities include

- (i) health information technology for better continuity of care and disease surveillance (COVID-19 response [reallocated funds]);
- (ii) COVID-19 management support (procurement of laboratory and medical equipment and consumables, furniture, and minor civil works); and
- (iii) prehospital care system enhancement to ensure more timely and higher quality of care of COVID-19 patients (procurement of ambulances and minor civil works to renovate ambulance stations).

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

c. Proposed activities under Additional Financing to support Output 3

20. The proposed activities include

- (i) Distance Learning Centre (DLC) and National Institute of Health Services (NIHS) development (minor civil works and equipment for information technology facilities);
- (ii) costs to accommodate project extension (includes PMU additional costs); and
- (iii) contingency allocations.

21. Annexure 1 gives a tentative list of interventions proposed in relation to each output.

22. **COVID-19 reallocation support of \$15 million.** Through memos dated 25 March 2020 and 10 April 2020, ADB approved the reallocation of \$10 million loan proceeds and \$5 million grant proceeds from the project to support the government in meeting the urgent requirements detailed above. The procurement under this financing is being utilized to procure essential

medical equipment, consumables, and necessary civil works which are in line with output 2 of the project.

23. The funds are being used to meet the urgent requirements of the central and provincial hospitals, COVID-19 treatments centres, etc. Among the various procurements under this \$15 million include, the establishment of a polymerase chain reaction or PCR lab at Mulleriyawa base hospital as a total solution; commitment of operational support for the functioning of this lab for one year, i.e., procurement of reagents and consumable, personal protective equipment (PPE), and various COVID-19-related urgent medical equipment; and refurbishment of cold room at Medical Research Institute which can be treated as a short-term solution. In addition, under the medium-term investment, the construction of the molecular biology lab at Infectious Disease Hospital, the renovation of isolation rooms at the National Institute Infectious Diseases, quarantine unit at the Medical Research Institute, and refurbishment of isolation centers at four harbors (Colombo, Galle, Hambantota, and Trincomalee) are currently at the bid evaluation stage.

24. **Additional Financing.** The COVID-19 component for the government COVID-19 response was added to the project via the \$15 million reallocation approved by ADB on 10 April 2020. A comprehensive assessment has been undertaken by PMU for all project activities, and the mission confirmed the additional requirement of \$5 million to cover the proposed 18-month extension of the project completion date from 30 November 2023 to 31 May 2025 to complete civil works and other project activities that were delayed due to the COVID-19 situation.

25. **Japan Fund for Poverty Reduction grant of \$3 million:** This shall support the additional financing in (i) reducing the response time of Suwa Seriya Ambulance Service (by expanding the present vehicle fleet by purchasing new ambulances and renovation of ambulance stations); (ii) reducing turnaround time of the Suwa Seriya Service; and (iii) improving the capacity of the emergency medical technicians, call centre staff, pilots, and ETU staff.

D. Indicative Financing Breakdown for Additional Financing

26. Table 1 below shows the summary of the financing plan for the proposed additional financing, which also includes a grant component from the JFPR and counterpart funding from the government.

Table 1. Indicative Financing Table (in \$ million)

Source	Current ^a		Additional Financing		Total	
	Amount (\$ million)	Share of Total (%)	Amount (\$ million)	Share of Total (%)	Amount (\$ million)	Share of Total (%)
Asian Development Bank						
OCR (regular loan)	0.0	0.00	110.0	89.43	110.0	60.11
OCR (concessional loan)	37.5	62.50	0.0	0.00	37.5	20.49
Special Funds resources (Asian Development Fund grant)	12.5	20.83	0.0	0.00	12.5	6.83
Japan Fund for Poverty Reduction (grant) ^b	0.0	0.00	3.0	2.44	3.0	1.64
Government	10.0	16.67	10.0	8.13	20.0	10.93
Total	60.0	100.00	123.0	100.00	183.0	100.00

ADF = Asian Development Fund, OCR = ordinary capital resources.

^a Refers to the original amount and past additional financing.

^b Administered by Asian Development Bank.

Source: Asian Development Bank.

III. ASSESSMENT OF THE LEGAL FRAMEWORK AND INSTITUTIONAL CAPACITY

A. Existing Health Care Waste Management Framework in the Country

1. Draft National Policy on Health Care Waste Management

27. In 2001, the Government of Sri Lanka drafted a comprehensive National Policy on HCWM. It has three main sections covering:

- (i) general considerations on HCWM and the institutional mechanism for policy implementation which should be set up at the national level;
- (ii) provisions for the safe management of health care waste (HCW) in medical institutions, including regulations and HCWM plans; and
- (iii) provisions for the implementation and the monitoring of HCWM plans at national and provincial levels, including legislation, provision of human and financial resources, training and awareness, and participation of the private sector.²

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

- (i) HCW generated by the medical institutions of the public and private sector must be safely handled and disposed of. HCWM is an integral part of hospital hygiene and infection control. Hence each health care facility (HCF) is legally responsible for the proper management of waste that it generates until its final disposal.
- (ii) Major hospitals must prepare specific HCWM plans outlining needs, objectives, strategies, procedures for approved management and disposal of HCW, and timeframe for implementation. The PDHS must set up annual provincial and district HCWM plans to present the strategy for HCWM that should be developed at the regional level. The provincial and regional plan shall be a compilation of individual HCWM plans of each HCF the province is responsible for. All plans need to be validated and supported by the Central or Provincial Health Services before implementation.
- (iii) Specific budget lines need to be developed relating to hospital hygiene and HCWM in the National Accountancy of the Health System to ensure sufficient human and financial resources are allocated to implement the HCWM plans in medical institutions.
- (iv) Policy implementation needs to be monitored based on specific objectives defined in the National Action Plan (the plan developed to implement the policy country wide—see section III.A.2) and that institutionally, the National Steering Committee on Clinical Waste Management is responsible for the overall monitoring and evaluation and the PDHS for the implementation of monitoring procedures in HCFs within their area of jurisdiction.
- (v) Other key aspects highlighted relate to approved HCWM practices, equipment for treatment and disposal, training and awareness, involvement of civil society, and private sector participation.

29. The institutional mechanism for implementing the National Policy is envisaged under three levels of management.

² Government of Sri Lanka, Ministry of Health. 2021. *Draft National Policy on Health Care Waste Management*. Colombo.

- (i) At the central level, coordination and development of strategies and mechanisms to implement policy commitments in accordance with national requirements have been vested with the National Committee on Clinical Waste Management (NCCWM). In addition, the development of training and capacity building packages, training implementation supervision, setting up of HCW monitoring protocols, overall monitoring and evaluation has been assigned to the NCCWM. The central health services are responsible for technically backstopping HCFs under its management purview.
- (ii) At the provincial level, implementation of the policy has been vested with the Provincial Councils. The PDHS is responsible for setting up provincial HCWM plans, synthesized from individual hospital HCWM plans coming under its area of jurisdiction, developing financial resources, and implementing HCW monitoring/auditing procedures.
- (iii) At the local level, the setting up of HCWM plans that outline needs, objectives, strategies, procedures, and timeframes for medical institutions has been vested with the hospital management.

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

1. National Guidelines on Health Care Waste Management

31. In 2001, the government drafted National Guidelines for HCWM 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 NCCWM as well as the MOH, they did not receive formal endorsement by the government.

32. The draft National Guidelines contain both practical and conceptual information on HCWM, covering four main sections:

- (i) definition and categorization of HCW, including potential harmful effects that can result from its improper management;
- (ii) procedures for segregation, packaging, labelling, collection, storage, transportation, and disposal (including the selection of appropriate treatment and disposal technologies for HCW) should be applied and followed by all HCFs in the country;
- (iii) instructions for the implementation of HCWM plans, including a detailed description of duties and responsibilities of health care provider at various levels; and
- (iv) instruction for personnel of Central and Provincial Health Services who oversee HCWM to ensure smooth implementation of the guidelines and to set up regular monitoring mechanisms.

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

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

35. **National color code.** 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 seven specific categories as per Table 2.

Table 2. National Color Code for Segregation of Health Care Waste

Color	Category	Contents
Yellow	Infectious	Cultures or stocks from microbiology, tissues from surgeries and autopsies, material or equipment in contact with blood or body fluids, soiled linen, dialysis equipment such as tubing and filters
Yellow with red stripes	Sharp waste	Sharps, needles, and IV sets contaminated with body fluids
Black	General waste	General or municipal waste that is uncontaminated
Green	Biodegradable waste	Garden, kitchen, and food waste
Red	Glass waste	Uncontaminated drink bottles and water bottles
Blue	Paper waste	Paper, cardboard, and office stationery
Orange	Plastic waste	Uncontaminated plastic medicine bottles, saline bottles without IV sets, plastic bags

IV = intravenous.

Source: Government of Sri Lanka, Ministry of Health. *Environmental Management Framework for Health Care Waste and Infrastructure Development*. Unpublished.

36. The National Policy on HCWM to this date remains a draft as all attempts for its formal adoption in the past have not been successful. As a result, there have been no legal enactments made to operationalize the policy. As such, to this date, the National Policy, and guidelines on HCWM serves as a broad guideline only with no mandatory binding legal requirement. The only legal requirement for HCW in Sri Lanka stems from the National Environmental Act, as explained below.

2. Guideline for Management of COVID-19 Infectious Waste

37. The Directorate of Environmental and Occupational Health (DE&OH) of MOH in March 2020 issued a guideline to manage COVID-19-related infectious waste and is available in **Annexure 1**. As per this guideline, the infectious waste generated from any HCF treating COVID-19 cases shall only be treated using the methods (i) incineration, and (2) using a metaMizer.³

³ This is a unit developed by Medivac Company, Australia which simultaneously uses steam-based sterilization and shredding to treat clinical waste. A volume reduction of 90% and weight reduction of 30% of waste could be achieved through the process and the processed material which is granular in nature can be recycled or buried in landfills safely.

B. Environmental Legislation

38. The requirement for environmental assessment and environmental pollution control in Sri Lanka is established by the National Environmental Act (NEA), No. 47 of 1980 and its amendments (No. 56 1988 and No. 53 of 2000).⁴ The three main regulatory tools implemented under the NEA are environmental impact assessment (EIA) and initial environmental examination (IEE), environment protection license (EPL) and scheduled waste license (SWL) supported by standards for discharge and waste disposal guidelines.

39. The procedures for EIA and IEE are defined in the EIA Regulations Gazette No. 772/22 1993 (footnote 4). The regulations prescribe the activities for which EIA/IEE is mandatorily required in three separate schedules. The need for an environmental assessment and the level of analysis required (EIA or IEE) for each development activity is screened by the Central Environmental Authority (CEA) based on the submission of a Basic Information Questionnaire by the developer. There are two possible screening outcomes.

- (i) **Exclusion from EIA and IEE.** The activity does not fall under the prescribed category or located in a sensitive area as defined in the regulations.
- (ii) **EIA and IEE required.** The activity falls under the prescribed category, has potentially serious environmental impacts and/or is in a sensitive area. With a positive screening decision, the CEA appoints a scoping committee to decide on the level of analysis and prepare the terms of reference, or if the project falls within the jurisdiction of government authority which is an appointed project approving authority to administer the EIA process, the CEA will hand over the process to the said authority.

40. The second regulatory tool under the NEA is the EPL. The EPL procedure has been introduced to prevent or minimize the release of discharges and emissions into the environment from industrial activities in compliance with national discharge and emission standards to provide guidance on pollution control for polluting processes and to encourage the use of pollution abatement technology. The EPL regulations define the prescribed activities for which a license is required and procedures for obtaining one. Since 2008, the NEA requires all medical institutions to obtain a valid EPL.

- (i) Part II of the National Environmental (Protection & Quality) Regulations, No. 01 of 2008 (footnote 4) includes “health care service centres generating infectious wastes, including medical laboratories and research centres” as a prescribed activity that requires a license.
- (ii) Schedule VIII⁵ lists HCW as a scheduled waste from specific sources that no person shall generate, collect, transport, store, recover, recycle, or dispose of except under the license issued by the authority and in accordance with standards and other criteria as may be specified by the authority.

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

⁴ <http://www.cea.lk/web/en/acts-regulations>.

⁵ Gazette No. 1534/18 dated 1 February 2008, on list of scheduled waste with type of industry.

42. The third regulatory tool under the NEA deals with the disposal of scheduled waste as defined through the Gazette Notification No. 1534/18 of 2008 (footnote 4). It deals with waste from specific and nonspecific sources. The notification has three parts and eight schedules of which Part I deals with the issue of environmental protection license for emission/disposal of waste., Part II deals with the issue of license for the management of scheduled waste (Hazardous Waste), and Part III on general matters including definitions and the effectiveness and validity of the license issued under National Environment (Protection and Quality) Regulations, No. 1 of 1990 published in Extraordinary Gazette No. 595/16 of February 1990. The eight schedules include the tolerance limits, applications, formats for reporting, categorization of nonspecific and specific waste, etc.

43. There are other key national legislations for environmental management and protection. The Flora and Fauna Protection Ordinance and the Forest Ordinance do not permit any construction activities in protected areas managed by the Department of Wildlife Conservation and Forest Department, respectively. If any development is bound to have an impact on protected areas, clearance from the two departments, as the case is, must be obtained.

44. The Antiquities Ordinance, No. 9 of 1940 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 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.

45. The Agrarian Development Act. No. 46 of 2000 prohibits any filling of paddy land for development without the written permission of the Commissioner-General of Agrarian Services.

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

47. The Urban Development Authority Act, No. 41 of 1978 and the Sri Lanka Land Reclamation & Development Corporation Act, No. 15 of 1968 require clearance to be sought when carrying out development work in areas that are declared under these acts.

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

Table 3. National Level Clearance that are Applicable to 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 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
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CEA= Central Environment Agency; DMA= Disaster Management Act; NBRO = National Building Research Organization; NEA= National Environment Act; EPL=Environmental Protection License; SWL=Schedule Waste License

Source: Asian Development Bank

49. Apart from the above, none of the other clearances is likely to be required as the infrastructure development proposed under the project will be limited to a modest expansion and upgrade of the existing building footprint and 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 wards and ETU. In the worst case, the land will be acquired for the proposed expansion, but this will be unlikely.

C. International Agreements and Conventions

50. Sri Lanka has acceded to or ratified around 40 multilateral environmental agreements, and those that are relevant to this project are shown in Table 4.

Table 4. Project-related international agreements to which Sri Lanka is a Party

Agreement	Date	Description
Atmosphere		
Vienna Convention for Protection of the Ozone Layer (1985)	15 Dec. 1989	Protection of the ozone layer through international cooperation in the areas of scientific research, monitoring and information exchange
Montreal Protocol on Substances That Deplete Ozone Layer (1987)	12 Dec. 1989	Reduction and eventual elimination of the consumption and production of Un-anthropogenic Ozone Depleting Substances
United Nations Framework Convention on Climate Change (UNFCCC-1992)	23 November 1993	Stabilization of greenhouse gas (GHG) concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climatic systems
Kyoto Protocol (1997)	3 October 2002	The parties (Developed Countries) to reduce their collective emissions of greenhouse gases by at least 5% of the 1990 level by the period 2008–2012
Biodiversity		
International Plant Protection Convention (1951)	12 February 1952	To maintain and increase international cooperation in controlling pests and diseases of plants and plant products and in preventing their introduction and spread across national boundaries
Plant Protection Agreement for Asia and Pacific Region (1956)	27 February 1956	To prevent the introduction into and spread within the region of destructive plants
CITES - Convention on International Trade in Endangered Species of Wild Fauna & Flora (1973)	4 May 1979	To protect specific endangered species from being over-exploited by adopting a system of import/export permits, for regarding the procedure
Convention on the Conservation of Migratory Species (1979)	6 June 1990	To protect those species of wild animals which migrate across or outside national boundaries
The Convention on Wetlands (Ramsar Convention) (1971)	15 October 1990	This is the intergovernmental treaty that provides the framework for the conservation and wise use of wetlands and their resources.
Convention on Biological Diversity (CBD-1992)	23 March 1994	Conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including appropriate access to genetic resources and by appropriate transfer of relevant technologies and proper funding

Agreement	Date	Description
Environmental Modification Convention (1976)	5 October 1978	This is an international treaty prohibiting the military or other hostile use of environmental modification techniques having widespread, long-lasting, or severe effects.
Biosafety, Health, and Sanitation		
Agreement on the Application of Sanitary and Phytosanitary Measures (1995)	1995	Broadly, the sanitary and phytosanitary measures covered by the agreement are those aimed at the protection of human, animal or plant life or health from certain risks
Biological Weapons Convention (1972)	26 March 1975	The Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and their Destruction
Cartagena Protocol on Biosafety (2000)	11 Sept 2003	The Cartagena Protocol on Biosafety to the Convention on Biological Diversity is an international agreement on biosafety as a supplement to the Convention on Biological Diversity
Cultural Heritage		
Convention concerning the protection of the World Cultural and Natural Heritage (1972)	6 June 1980	To establish a system of collective protection of the cultural and natural heritage of outstanding universal value organized permanently and by modern scientific methods
The UNESCO World Heritage Convention (1972)	06 June 1980	Convention concerning the protection of the World Cultural and Natural Heritage
Chemicals		
Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and Their Disposal (1989)	28 August 1992	To reduce transboundary movements of hazardous waste; to dispose of hazardous and other waste as close as possible to the source; to minimize the generation of hazardous waste; and to prohibit shipments of hazardous waste to countries lacking the legal, administrative and technical capacity to manage and dispose of them in an environmentally sound manner
Rotterdam Convention (1998)	19 January 2006	To promote shared responsibility and cooperative efforts in the international trade of certain hazardous chemicals, to protect human health and the environment, to contribute to the environmentally sound use of those hazardous chemicals by facilitating information exchange, and providing for a national decision-making process on their import/export
Stockholm Convention on Persistent Organic Pollutants (POPs) (2001)	22 December 2005	To protect human health and the environment from persistent organic pollutants (POPs)

Source: Asian Development Bank

D. Safeguard Requirements of ADB

51. 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. Borrowers 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.

52. For existing facilities that are considered for expansion or upgrading that has potential impacts on the environment, an environmental compliance audit will be conducted to inform status of compliance with national environmental requirements and identify any environmental issues. Where noncompliance is identified, a corrective action plan agreed on by ADB and the borrower will be prepared. The plan will define necessary remedial actions, the budget for such actions, and the time frame for resolution of noncompliance.

53. All projects funded by the ADB are first screened and categorized for environment, involuntary resettlement, and indigenous peoples safeguards in the early stages of project preparation. Screening and categorization are 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.

54. The proposed additional financing shall continue the environmental review process adopted in the ongoing HSEP and 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. REA checklist adopted under the ongoing project shall be used for screening and categorization of subprojects under the additional financing.

55. **Hazardous waste handling.** The ADB SPS (2009) stipulates that the borrower will avoid the manufacture, trade, and use of hazardous substances and materials subject to international bans or phaseouts because of their high toxicity to living organisms, environmental persistence, the potential for bioaccumulation, or potential for depletion of the ozone layer, and will consider the use of less hazardous substitutes for such chemicals and materials. The only hazardous material generated under HSEP is the demolished asbestos cement sheet wastes and requires careful handling and safe disposal.

E. Review of Institutional Capacity of Executing Agency

56. The MOH, through the PMU and PIUs, will deliver the project. Management of environmental safeguards of the project is linked to all three components. Component 1 involves shared care cluster support under which base hospital development in nine districts and upgrades and expansion to physical infrastructure in secondary care health facilities. Component 2 involves health information technology for better continuity of care and disease surveillance (COVID-19 response [reallocated funds]) and COVID-19 management support. Component 3 involves Distance Learning Centre and NIHS development, costs to accommodate project extension (includes PMU additional costs), and contingency allocations.

57. The MOH, through its PMU and the provinces through the PIUs, will be responsible for conducting environmental screening and follow up assessments, preparing relevant documents, and monitoring compliance. The MOH has a DE&OH headed by a deputy director-general and has a separate budget line under the MOH. The DE&OH has sufficient staff strength with capacity for occupational health and safety, food, and drug safety, HCWM, etc. Regarding HCWM, the DE&OH has facilitated EPLs/SWLs for major hospitals in all nine provinces so far through the

provision of training, evaluation, and follow up support. The MOH will be directly involved in the project as the chair of the Ministerial Project Steering Committee. The MOH 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.

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

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

IV. ANTICIPATED ENVIRONMENTAL IMPACTS

60. Preliminary lists of subprojects to be financed under the additional financing have been identified and attached as Annexure 2. It is likely that future subprojects will seek to replicate the subprojects in the ongoing HSEP and are thus expected to be category B and C due to the low-impact nature of such works. No category A type of works (with significant impacts) are anticipated. Subprojects projected to have potentially significant adverse environmental impacts (categorized as A) will not be considered for implementation under this project. For small-scale infrastructure and service improvement subprojects it is anticipated that impacts will be minimal, temporary, and of short duration. A special emphasis is given on the issue of HCWM. Other anticipated environmental impacts and mitigation measures are also discussed in the following sections and summarized in Tables 5 and 7. These are indicative impacts and will need to be further explored during the detailed design stage.

A. Managing Health Care Waste

61. Most of the hospitals in Sri Lanka do not practice the safe disposal of HCW (both solid and liquid waste) due to the lack of proper waste management facilities. However, the health care administrators, hospital authorities, health care personnel, as well as the patients and the general public at large, acknowledge the importance of adopting proper HCWM practices to safeguard public health and to protect the environment.

62. The recent global outbreak of COVID-19 and the pandemic situation in Sri Lanka has forced the health care institutions to look at proper waste management as a matter of utmost urgency, as a measure to curb the spread of the disease as well as other communicable diseases to safeguard the health of the general public, as well as the environment. Having identified the need for providing facilities for proper HCWM for selected base hospitals and hospital clusters,

the HSEP proposes two major interventions: (i) management of solid HCW, and (ii) management of wastewater.

1. Management of solid health care waste

63. Waste generated by health care activities includes a broad range of materials, from used needles and syringes to soiled dressings, body parts, diagnostic samples, blood, chemicals, pharmaceuticals, medical devices, and radioactive materials. Poor management of HCW potentially exposes healthcare workers, waste handlers, patients, and the community to infection, toxic effects, and injuries; and risks polluting the environment. It is essential that medical wastes are segregated at the point of generation, appropriately treated, disposed of safely.

64. Of the total amount of waste generated by healthcare activities, about 70%–90% is general waste. The remaining part is considered hazardous material that may include (i) infectious waste, (ii) pathological waste, (iii) pharmaceutical and chemical waste, (iv) genotoxic waste, (v) sharps, and (vi) radioactive waste. HCW contains potentially harmful microorganisms which can infect hospital patients, healthcare workers, and the general public; and improper disposal can have detrimental effects on the environment as well. Every HCF is responsible for the proper management of waste it generates until its final disposal.

65. Implementing adequate systems to safely manage HCW generated is the only way to control and reduce risks of accidental injury and disease transmission inside a hospital and to ensure the health of hospital staff and the general public are protected. HCWM should be considered a part of hospital hygiene control, and hence it is imperative that each HCF supported under the project implement adequate measures to safely manage and dispose of HCW. In order to manage HCW, the project proposed to install HCWM facilities at selected hospitals to serve a cluster of hospitals.

2. Management of wastewater from HCFs

66. Health care wastewater consists of (i) black water containing high concentrations of fecal matter, urine, and toxic chemicals with high potential for pollution, and (ii) greywater containing discharge from washing, cooking, bathing, and 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. There are only a few HCFs in the secondary sector that have piped sewerage, and at the majority of hospitals, the wastewater is disposed of without proper treatment, in most cases on-site disposal by way of septic tank/soakage systems or the on-site collection and off-site disposal using gulley bowers. There are many risks associated with current (partially or untreated) wastewater disposal practices, especially if septic tanks are not watertight, old, and leaking or if the groundwater table in the area is naturally high, such as (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 into the environment without prior treatment. Mitigation measures for managing wastewater is to implement properly designed treatment systems. The volumes of wastewater produced in secondary HCFs, such as base hospitals and district hospitals, are significant compared to lower grade hospitals, and treatment options should be evaluated in a site-specific way during project implementation.

67. Therefore, the scope of work proposed under the project involves providing HCWM facilities to selected secondary health care facilities and would typically involve construction and

installation of wastewater collection, treatment, and disposal systems for selected base hospitals or district hospitals; and HCW, transportation, storage, and treatment and disposal systems to the cluster of hospitals—both to comply with National and International Standards related to pollution and emission controls.

B. Impacts During Planning and Pre-construction Phase

68. All nine apex hospitals selected under additional financing are located within lands owned by MOH. Proposed renovation, refurbishment works, and construction of new buildings, including sewage treatment and disposal, shall be limited to the available lands within each facility. Thus, there shall be no acquisition of private lands. There shall be no physical and economic displacement of any private party leading to involuntary resettlement as no encroachments are allowed into these lands. Obtaining approvals and consents, and compliance of designs with regulations and standards are required during the planning and pre-construction phases. Further the impacts and mitigation measures related to the selection of sites and impacts on the functioning of the existing HCF and the surrounding environment are highlighted in Table 5.

69. The winning contractor will bid based on the concepts and details included in the bid documents. The bidders will be advised to make their due diligence study before bidding. Necessary documents and study reports will be made available to them for their evaluation. It will be up to the bidders to maximize the use of resources made available to them.

C. Impacts Anticipated During the Construction Phase

70. The potential adverse impacts envisaged during the construction phase of the project are given in Table 5. Most of the potential construction-related impacts are localized, temporary in nature, and can be mitigated with good construction and site management practices.

Table 5. Anticipated Impacts and Mitigation Measures During Planning and Construction Phases

Impact Field	Potential environmental issues/impact	(a) Likelihood of occurrence (b) Level of impact	Recommended mitigation measures
(1) Planning and pre-construction impacts			
<u>Obtaining and complying with environmental standards and clearances:</u> Not obtaining and/or complying with the conditions and guidelines provided in environmental regulations, clearances and approvals	All waste collection, storage, handling, transportation, treatment, and disposal of waste and/or effluent discharges must be planned and designed to meet national environmental regulations and standards specified by the authorities. This is especially applicable to the design of wastewater as well as for solid HCWM systems, which include collection, treatment and disposal for both wastewater and HCW, and in addition, transport, and storage for HCMW. Non-compliance and non-conformity to design standards and good construction practices will also lead to unexpected environmental impacts at the latter stages of the project.	(a) Most likely to occur if not complied with regulations, standards, and environmental guidelines (b) High	<ul style="list-style-type: none"> • Designs and planning have to be carried out with proper attention paid to complying with waste discharge standards (See Operation Phase for details). • The conditions and guidelines for avoidance and mitigation of general and site-specific environmental impacts highlighted by the authorities (if any) should be complied with during designs implementation and operations. • Investigations, surveys, tests, designs, drawings, parametric derivations, and any other preparatory activities should be carried out as per relevant national and/or international standards and necessary reports prepared to comply with industry-accepted norms and procedures.
<u>Site selection and suitability:</u> Especially for land selected for HCWM facilities, wastewater treatment plants, and any other facilities proposed for the hospitals	Site clearance and development will impact either directly or indirectly adjacent environments. Locations selected for project interventions may lead to pollution and deterioration of ecosystem components, especially water, soil and air due to emissions (effluent discharge and sludge disposal, air emissions and bottom ash disposal, etc.).	(a) Likely to occur if site selection is not properly done (b) High	<ul style="list-style-type: none"> • Evaluations of alternatives (different sites, scales and designs) should consider the environmental and social sensitivity of target project areas, even though the footprint may be small. • Other than proximity to hospital facilities, adjacent land use and communities must be included in the assessment of site suitability.
<u>Shifting of utilities and Interruption to water supply & sanitation services:</u> Shifting of utilities and drainage structures before construction	Shifting of utilities such as drainage structures, water supply and sewer pipes, electric poles, and wires, if any, that are located within the project areas may cause temporary disruption to such services. Modification or alteration of drainage paths, canals and structures may cause flooding, and waterlogged conditions and may lead to	(a) Likely to occur (b) Low	<ul style="list-style-type: none"> • Proper planning of shifting of utilities and any other drainage structure should be planned well ahead of site clearing. • It is likely that the wastewater treatment plant may be located at the location of the lowest elevation within the hospital site, towards which stormwater may also have been diverted at present. Such structures

Impact Field	Potential environmental issues/impact	(a) Likelihood of occurrence (b) Level of impact	Recommended mitigation measures
	increased erosion.		should be diverted appropriately.
Planning for interruption of vehicular and patient movements	<p>Movements of visitors to the hospital, including patients, vehicular flow (especially emergency vehicles), and parking facilities, may be affected during construction.</p> <p>In addition, impacts are notable if routes for delivery and storage of construction materials and temporary blockages are not planned and coordinated properly.</p>	<p>(a) Less likely to occur as the sites may be located away from places where patient movements are high</p> <p>(b) Low</p>	<ul style="list-style-type: none"> Proper planning and coordination of activities prior to the commencement of construction works is needed.
(2) Impacts anticipated during the construction phase			
Impacts due to site preparation activities, clearing of vegetation, and ground preparation	Loss of vegetation, emission of dust, and noise are direct impacts that can be expected due to site clearing. Such impacts may cause a nuisance to hospital staff, patients and the neighborhood	<p>(a) Dust and noise are not likely to be significant impacts since the facilities are confined to locations mostly away from locations frequently visited by patients</p> <p>(b) Low to moderate</p>	<ul style="list-style-type: none"> Removal of vegetation on-site should be restricted to the bare minimum. Erosion control during land preparation activities and cutting and filling within the site premises is needed. Rainy periods should be avoided to the extent possible for land clearing. Surface runoff should be diverted away from the site and/or construction site, and drainage should be diverted through silt traps (if needed). Any loose soil within site should be compacted as soon as possible. All spoil, topsoil, demolition waste, and cut vegetation should be covered by secure tarpaulins whenever stored on-site and transported off-site to prevent material from being blown away by trucks. Prohibit burning of vegetative matter and domestic waste; ensure that wastes are not haphazardly thrown in and around the site; and provide proper collection areas, bins, craters, etc. Conduct site clearance and restoration to original condition after the completion of

Impact Field	Potential environmental issues/impact	(a) Likelihood of occurrence (b) Level of impact	Recommended mitigation measures
			construction work before issuing of completion certificate.
Impacts due to the demolition of buildings and other structures (if any)	<p>Demolition and dismantling of existing buildings (if any—full or partial) will result in noise and dust during demolitions. Demolition (if any), excavations, and trenching will produce additional amounts of waste and spoil. Accumulation of debris, construction waste materials, and stockpiling can cause environmental pollution.</p> <p>Moreover, the generation of waste containing asbestos cement (AC) sheet, which, if improperly disposed of, can cause a risk to public health from air-borne asbestos fiber.</p>	<p>(a) Likely to be a significant impact if demolition of structures is needed and asbestos waste is generated as a result.</p> <p>(b) Low to moderate</p>	<ul style="list-style-type: none"> • Ensure engagement of a competent person or contractor to undertake the survey, prepare the necessary asbestos risk assessment and management plan, and demolition. • Prepare and implement a construction waste management plan including an asbestos management plan in it (a guideline for removing AC sheets from buildings is included in Annexure 3); and include waste minimization measures in the plan. • Consult the hospital authorities after careful removal of such reusable/recyclable material and hand over to the material stocks to them. It is the responsibility of the contractor to keep records of such material that are handed over to the hospital authorities. • Reuse as much demolition waste and material as much as possible. • Asbestos sheets should be reused rather than disposed of. Extra care should be exercised in removing and, if needed, disposal of asbestos products. • Find alternative beneficial uses for any unused building material, e.g., fills in other construction works, fixtures, and fittings to be reused. • There should be no open burning of any demolished material, on-site or off-site. • Workers should be provided with appropriate safety wear, worker personal

Impact Field	Potential environmental issues/impact	(a) Likelihood of occurrence (b) Level of impact	Recommended mitigation measures
			protective equipment (PPE) during demolition, and disposal.
Extraction and sourcing of materials	Most of the work involved in the establishment of wastewater and HCWM systems include electro-mechanical works. The need for construction material is only for civil works involved in the construction of wastewater collection systems, foundations, tanks, storage yards, etc.	(a) Large quantities of construction material are unlikely to be required, but only in cases where ground filling and levelling will be required. (b) Low	<ul style="list-style-type: none"> • If procurement of earth, sand, and quarry material is needed, it should be from sources that are operating with the required licenses. • If the contractor uses water supplies available at the hospital, necessary approvals shall be obtained from the hospital authority or the water supply provider, as required.
Impacts on Air quality	Emissions during site preparation, vehicles, equipment, and machinery used for excavation and construction may result in dust and air-borne pollutants.	(a) Unlikely to occur widely (b) Low	<ul style="list-style-type: none"> • Effective dust barriers have to be erected to prevent dust from being blown towards other parts of the hospital (this barrier can function as noise and dust containment as well as for fencing the site premises that is used for safety reasons). The louvres and pergolas of nearby buildings must be temporarily covered with polythene sheets until the construction work is over. • The site should be cleaned daily, especially surfaces that are affected by soil and dust. Regular watering (at least twice a day during the mid-morning and mid-evening) should be carried out in the construction site for dust suppression. • Excavated soil that is temporarily stored on-site should be covered in a tarpaulin or other suitable material to prevent dust particles from getting airborne. • Where possible, construction stockpiles and debris piles should be stored away from the functional areas of the hospital. • Any equipment and machinery which uses diesel shall be appropriately maintained to control emissions. The contractor has to

Impact Field	Potential environmental issues/impact	(a) Likelihood of occurrence (b) Level of impact	Recommended mitigation measures
<p>Deterioration of surface water quality</p> <p>Drainage and hydrological modifications and modified flow patterns can lead to local flooding, increased erosion and sedimentation, slope instability</p>	<p>Untreated or partially treated wastewater, improper disposal of waste (both liquid and solid waste), silt materials, runoff from stockpiled materials, and chemical contamination from fuels and lubricants during construction works can contaminate nearby surface water quality. Drainage, surface runoff and hydrological modifications.</p> <p>Impacts can occur due to drainage obstruction during (i) construction of temporary access roads and parking lots; (ii) reclamation of land; (iii) diversion of drainage paths; (iv) crossing of pipelines at culverts; (v) earthworks, trenching, construction of pipelines, and filling; (vi) residue, spoil and dredged material and other solid waste disposal; (vii) transport of construction materials; and (viii) improper landscaping.</p>	<p>(a) Less likely to occur widely</p> <p>(b) Low</p>	<p>ensure that vehicles entering the site have obtained Vehicle Emission Certificates.</p> <ul style="list-style-type: none"> • Maintain cross drainage within the site during construction. Hence, stockpiles and debris must be safely stored away from these drainage paths. • Where blockage of drainage is unavoidable, alternative paths must be created to facilitate stormwater flows from the site to the outside. • Lead away drains that collect water from the internal drainage system of the nearby buildings must be kept clean and free from any constrictions to ensure a smooth flow of stormwater. • A washing area for construction equipment should be delineated within hospital premises away from the construction area. • Wastewater from the construction site should not be directly discharged into roadside drains. It should be first directed to a pit to allow siltation and percolation before connecting to a lead away drain. • The workers may use existing toilets in the hospital premises with the consent of the hospital authorities. Such use of toilets should not affect other users of the hospital in any way. Also, it has to make sure that such use of toilets will not affect the health of the workers, as the toilets may be used by patients, thereby exposing workers to undue health risks.
<p>High levels of noise and vibration</p>	<p>An increase in noise levels and the vibration is possible due to excavation, earth-moving and blasting (if any), and the transport of</p>	<p>(a) Unlikely to occur widely</p>	<ul style="list-style-type: none"> • Construction work within the site, vehicles and equipment used in construction work should meet CEA standards for noise and

Impact Field	Potential environmental issues/impact	(a) Likelihood of occurrence (b) Level of impact	Recommended mitigation measures
	equipment, materials, and people. Installation of electro-mechanical components may emit high levels of noise. The operation of heavy equipment and machines in the nighttime can cause a nuisance to the surrounding hospital environment/people.	(b) Low	<p>vibration in Sri Lanka.</p> <ul style="list-style-type: none"> • High noise-generating activities should be scheduled after informing and with the consent of the hospital authorities. • Noise barriers must be erected, if needed, to cut down high noise. However, the contractor can separate site premises with a delineated barrier with a dual function of dust and noise containment and safety. • The 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 for in-patients and the neighborhood. • If certain nighttime construction activities are unavoidable, they should be done using noise-reducing means or low-noise technologies. • Noisy construction machines or activities should be scheduled to coincide with non-clinic and non-OPD days or times as much as possible, or on days that patient visitation to the facility is minimum. • Liaising with the hospital authorities regarding the work schedules is always advisable. Prior notices of noise generating activities will avoid confusions among hospital authorities and the contractor. • Conformity to the Interim Standard on Vibration Pollution Control for Sri Lanka is needed. • If vibration causes structural damages to

Impact Field	Potential environmental issues/impact	(a) Likelihood of occurrence (b) Level of impact	Recommended mitigation measures
			nearby structures, the contractor is liable to rectify such damages.
Slope stability Soil erosion and sedimentation	<p>Exposed slopes; cutting and filling operations; altered landscape; blasting and removal of boulders; removal of trees, roots and trunks; drainage modifications; and modified flow patterns can cause issues related to slope stability.</p> <p>Slope instability will cause loss of ground, causing damage to public and private land and built property in the neighborhood.</p> <p>Soil erosion and sedimentation may be caused during construction due to land clearing; earthworks involved in cutting or filling; trenching; excavating; reclaiming and landfilling; diversion of existing drainage paths; and transport and stockpiling of construction material, residue, spoil, dredged material, etc.</p>	<p>(a) Likely to be an impact, especially in areas with sloping land.</p> <p>(b) Low</p>	<ul style="list-style-type: none"> • Medium- to long-term slope stability should be considered in selecting sites for treatment plants and project interventions if proposed in sloping terrain. • If land clearing is done at sites with vertical relief, exposed bare sloping ground may be subjected to slope instability, mainly during rainy seasons. In sites involving the removal of rocks and boulders, slope instability may arise, depending on the slope and material.
Storage and disposal of dredged material, spoil and muck Impacts due to construction waste and storage of material	<p>Improper extraction; storage; disposal of dredged material, spoil and muck from excavation; and cleaning of drainage canals can cause environmental pollution.</p> <p>Blocking of drainage paths leading to water stagnation and localized flooding within the facility, eventually lead to the breeding of mosquitoes.</p> <p>Some activities will produce hazardous waste, and inappropriate disposal practices can contaminate land and waterways.</p>	<p>(a) Blocking of drainage could potentially occur during monsoons in the absence of good site management.</p> <p>(b) Moderate</p>	<ul style="list-style-type: none"> • Maintain cross drainage within site always during construction. Hence, stockpiles and debris must be safely stored away from these drainage paths. • Where blockage of drainage is unavoidable, alternative paths must be created to facilitate stormwater flows from the site to the outside.
Damages to ecological resources (removal of trees and vegetation)	Encroachment into ecologically-sensitive areas, clearing of green areas, and felling of the trees may affect terrestrial ecological	(a) Removal of large trees is likely to occur in some sites but will not	<ul style="list-style-type: none"> • Large trees with DBH more than 30 cm should be removed only if they impinge on the design.

Impact Field	Potential environmental issues/impact	(a) Likelihood of occurrence (b) Level of impact	Recommended mitigation measures
	<p>balance, loss, and degradation of habitats, etc.</p> <p>Activities such as the removal of trees and rehabilitation of existing habitats where faunal and avifaunal habitats have been established will lead to disturbances to such habitats. Heavy silt runoff and water pollution can cause damages to aquatic environments.</p>	<p>be widespread</p> <p>(b) Low</p>	<ul style="list-style-type: none"> Large trees providing shade should be preserved as much as possible and incorporated into the landscape design. A compensatory tree planting program should be developed to replant native species wherever available space within the hospital premises and maintained until grown well.
Labour camps	<p>Soil and water pollution from labor camp discharges</p> <p>Social conflicts</p> <p>Spread of infectious diseases</p>	<p>(a) Large labor camps are unlikely to be required as the scale of construction envisaged is small</p> <p>(b) Low to Moderate (considering the present pandemic situation)</p>	<ul style="list-style-type: none"> Priority should be given to hiring local labor for the unskilled category to generate employment opportunities as well as to minimize social conflicts. Labor camps should be sited appropriately with consent from the necessary public authority or the implementing agency. Labor camps shall be provided with adequate and appropriate facilities for disposal of sewage and solid waste. Domestic solid waste shall be collected and disposed of daily at the local authority (LA) designated site or given for collection by the LA. Discharge and disposal domestic waste from worker camps into water sources should be strictly avoided. Burying and burning domestic waste in the project site should also be strictly avoided. Avoid construction workers staying overnight in the construction sites. Mobilize maximum capacity of skilled and unskilled labor force from the surrounding project area. Identify location of camps with consultation of LA. Camps should not be located near water ways, human settlements or near drinking

Impact Field	Potential environmental issues/impact	(a) Likelihood of occurrence (b) Level of impact	Recommended mitigation measures
Impacts on occupational health and safety	Occupational hazards can arise during construction (e.g., trenching, falling objects, high levels of noise and vibration, accidents, etc.) and operations of newly built infrastructure, especially treatment plants.	(a) Occupational health and safety issues are less likely to occur as construction works are small in scale (b) Moderate	water intakes. <ul style="list-style-type: none"> • A safe construction site should include: (i) fully functional and well-maintained equipment, (ii) availability of emergency equipment and safety warnings, and (iii) worker personal protective equipment (PPE) and a strong commitment to follow safety practices with proper supervision of labor with proper monitoring and feedback. • Workers must be provided with first aid and health facilities. First aid training should be provided to the supervisor. • The constructors should carry out suitable training programs on occupational health and safety for workers. • Machinery and equipment that could easily electrocute should be kept safely within site and always under the supervision of an experienced worker. Arranging regular safety checks for vehicles and equipment is needed, including the labor huts. • Allocation of responsibility to the relevant personnel is needed. Prohibition of alcohol and other narcotic substances, which may impair the judgment of workers engaged in construction activities, should be enforced. • Excavated areas for construction should be barricaded using barricading tapes and signboards. When work is done at higher elevations, the work should be carried out and supervised by experienced workers.
Impacts on community health and safety, traffic hazards, and safety of hospital staff and patients	Disturbances caused to accessing property and facilities (especially vehicular access) to hospital facilities and services can cause inconvenience to patients, hospital staff and visitors during construction, trenching, and other construction activities.	(a) Public health and safety issues are likely to occur in all sites given that construction will take place within hospital premises while	<ul style="list-style-type: none"> • The construction site should be delineated from the rest of the hospital, preferably using barricading tape or any other suitable material that separates the construction area from the rest of the hospital physically.

Impact Field	Potential environmental issues/impact	(a) Likelihood of occurrence (b) Level of impact	Recommended mitigation measures
	Community hazards can arise during construction (e.g., open trenches, air quality, noise, falling objects, etc.). Trenching within hospital premises on pavements or any other paved road and areas using pneumatic drills will cause noise and air pollution.	healthcare services are continuing to be delivered, and that a large majority of hospital users are patients. (b) Moderate to high	<ul style="list-style-type: none"> • A safe pedestrian pathway to the hospital buildings should be provided if regular access along with the nearby gate and the hospital access road is blocked. • Signboards and directions for such detouring and shifting of facilities should be placed in all the two local languages, at prominent locations and in large-sized lettering. Safety of the peripheral areas of the site and access paths should be ensured at all times, e.g., non-slippery surfaces, clear of any obstructions and dangers, maintaining clean, tidy, and well-managed sites and activities, etc. • Safety signs should be placed at appropriate locations, informing the public of any dangers posed by construction-related activities. • Emergency access should never be obstructed. Alternative access for the ambulance and vehicular access should be provided whenever needed. • Strict entry controls to the site premises should be in place so that unauthorized entry is debarred. • Notices should be provided to hospital staff and users about the schedule of construction activities with particular, hazards, and potential noise and dust episodes, etc. • Concrete mixer trucks or any other trucks and construction vehicles should not be parked outside the hospital premises, as access roads may be narrow or busy. • Advance public notices should be displayed so that the hospital users are informed of the tree cutting.

Impact Field	Potential environmental issues/impact	(a) Likelihood of occurrence (b) Level of impact	Recommended mitigation measures
			<ul style="list-style-type: none"> All slopes should be strengthened by appropriate engineering interventions. Access roads and access paths should be rehabilitated to their original conditions.
Physical Cultural Resources (PCRs)	There are structures in some hospitals which are more than 100 years old. Excavations and trenching can uncover and/or damage archaeological and historical resources.	(a) Less likely to occur (b) Low	<ul style="list-style-type: none"> All the staff and laborers of the contractor should be informed about the possible items of historical or archaeological value, which include old stone foundations, tools, clayware, etc. If something of this nature is uncovered, the Department of Archaeology shall be contacted, and work shall be stopped immediately. The chance finds procedure of archaeological and cultural artefacts should be established.
Expansion of building footprint	Encroachment into ecologically sensitive areas	(a) Extremely unlikely (b) Low	<ul style="list-style-type: none"> Work shall not interfere with ecologically sensitive areas or with wildlife.
Clean-up operations, restoration, and rehabilitation	Impacts on social or sensitive receptors when post-construction requirements are not undertaken, e.g., improper closure of the campsites and yards, disposal of solid and liquid waste, and restoration of land after the project construction.	(a) Likely to occur (b) Low	<ul style="list-style-type: none"> Provide proper rainwater drainage network to the areas peripheral to the site, which will also prevent local flooding of low-elevation areas of the hospital premises, avoid soil erosion in the sloping terrain. Any lead away drains, gutters, and drains of other buildings, if damaged or altered during construction, should be restored. Rehabilitation of areas used for labour huts, offices, material storage yards, temporary drains, toilets, etc. Turfing any exposed ground area, especially sloping terrain, to avoid soil erosion and landscaping with suitable trees. This will prevent soil erosion of the peripheral areas of the subproject.

AC = asbestos cement, HCW = health care waste, HCWM = health care waste management, LA = local authority.

D. Operational Phase

71. The potential adverse impacts envisaged during the operational phase are related to the generation, handling, and disposal of HCW. All types of solid, liquid, and gaseous waste that is generated during diagnosis, treatment, or in medical research that can cause detrimental effects on human health and the environment when discharged or disposed of is considered medical waste. Generally, only a small percentage of the wastes produced by HCFs is hazardous, while a large percentage is general or non-hazardous waste. Even though the proportion of hazardous HCW is relatively small, the risk they carry in terms of transmitting disease and polluting the environment due to careless disposal is very high.

72. The proposed project support will be provided to expand/improve the services of selected secondary care healthcare facilities. With the expansion and improvement of facilities of these HCFs, there is a likelihood of generating more HCW, which in the absence of safe management and disposal practices can lead to the following risks:

- (i) **Occupational risks.** During handling of wastes, medical and ancillary staff (including sanitary labourers) can be injured if the waste has not been safely packed. Sharps are the most dangerous in this respect and can cause serious injury and transmit diseases such as HIV/AIDs, hepatitis B, and skin diseases.
- (ii) **Risks to the public and environment.** The public can be infected by HCW directly or indirectly through several routes of contamination. Open dumping of untreated or inappropriately treated HCW within or outside hospital premises is one of the main causes of such contamination. With stormwater runoff, this waste can potentially find its way to surface water bodies, causing widespread pollution and the spread of diseases.

73. Many HCFs report that plastics refuse such as saline bottles and used syringes are 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 World Health Organization (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 general public face a grave risk from untreated syringes that are improperly discarded or put to secondary use.

1. Development of Health Care Waste Management Plans for each Healthcare Facility in the Cluster

74. In the last 15–20 years, Sri Lanka has made noteworthy progress in implementing a national framework for the safe management of HCW in the country. Several critical initiatives aimed at implementing a standardized system has been taken, and they include (i) drafting of a National Policy for HCWM; (ii) development of national guidelines, color codes and code of hygiene HCFs; (iii) drafting of a National Action Plan (NAP); (iv) consolidation of NEA by gazetting HCW disposal as a prescribed activity requiring an EPL; and (v) creation of a budget line for HCWM in the national budget for health services. Implementation of the NAP has been selective, but HCWM systems have been successfully implemented in the public hospitals within Greater Colombo and several major provincial hospitals. A recent environmental audit conducted by the MOH under the World Bank-funded Second Health Sector Development Project observes a steady increase in the implementation of safe procedures for HCWM within secondary and tertiary HCFs. The audit reports that healthcare waste segregation in these facilities according to the

national color code is close to 100% and that a higher percentage of hospitals practice environmentally-friendly disposal and possess a valid EPL and SWL.

75. The status of the primary healthcare sector is somewhat different. The PHC sector in Sri Lanka, which consists primarily of PMCUs and divisional hospitals A, B, and C, has long been neglected and underutilized, resulting in the over-burdening of the larger centrally and provincially managed hospitals. The government's current thinking intends to change this approach and to strengthen community-based health services supported by the PHC sector to address some of the health challenges faced by the country. As such, some of the successes achieved in the environmentally friendly and safe management of HCW in the secondary and tertiary sector, as highlighted above, are not representative of the primary sector.

76. The production of hazardous HCW in primary facilities such as PMCUs and divisional hospitals and base hospitals is generally limited to general infectious waste (that consists of cotton swabs, wound dressings, plasters, bandage, gloves, etc.) and sharps (injections, surgical blades, and cannulas) in small quantities. Where laboratory services are available such as in divisional hospital A and B type of HCFs and base hospitals, blood and urine samples from patients generate small volumes of hazardous liquid infectious waste. The fewer categories and smaller quantities of HCW generated in the primary sector are due to the specific level of services primary care health facilities offer (no surgeries and rare deliveries) and the generally low bed occupancy rates. There are no records of HCW quantities produced in any of the primary facilities, which is a major gap. Reasonably accurate data on waste production is essential as it forms the basis on which suitable HCWM strategies are identified. As such, it is important for medical institutions to collect data on hazardous HCW generation as a first step to implementing an HCWM program.

77. In general, current HCWM practices in primary care hospitals are not safe and pose significant risks to public health and environmental quality. The risk will increase with higher quantities of HCW generated post-project investments. While the management of HCW in primary facilities is significantly less problematic due to the very low generation compared to major hospitals, the risk of accidental disease transmission and injury remains significant.

78. As such, each HCF strengthened under the project should mandatorily develop an HCWM plan for implementing and improving procedures for the safe collection, on-site transportation, storage, and disposal of HCW generated within the facility. In doing so, it is important to ensure that individual HCWM plans are compatible with thinking at the provincial level and that collectively they will contribute to a strategic HCWM plan at the province and district level.

79. The Draft National Policy and National Guidelines for HCWM in Sri Lanka developed in 2001 by the MOH has two important documents to refer to in developing such plans. It provides clear a framework in directing HCFs in setting necessary procedures and standards to comply with the policy and legislative requirements. As per the Draft National Policy for HCWM of 2001, it is envisaged that the PDHS will set up provincial and district HCWM plans presenting the overall strategy for HCWM at the province and district level.

80. The specific objectives of an HCWM plan for an HCF include the following:

- (i) improving occupational health conditions for staff, caretakers, and waste handlers;
- (ii) reducing the risk for people (patients, attendants, visitors, public, scavengers, etc.) and animals (stray dogs, cattle, crows, etc.); and
- (iii) establishing and operating environmentally sound treatment and final disposal of hazardous medical waste.

81. The HCWM plan should typically contain details on:

- (i) an estimation of the quantities of hazardous and non-hazardous HCW generated;
- (ii) clear procedures and practices for management of HCW from the point of generation to final disposal covering segregation, handling, collection, internal transportation, storage, treatment, and final disposal. It should also include standardized waste collection timetables from each ward and department and locations;
- (iii) provision of resources and equipment required for the implementation of the HCW plan;
- (iv) strategy for raising awareness among hospital staff about risks associated with HCW;
- (v) annual training and capacity building programs for HCF staff members;
- (vi) designation of duties and responsibilities for each of the different categories of HCF staff members who will generate or be involved in the management of HCW; and
- (vii) contingency plans for the storage or disposal of hazardous HCW in the event of a breakdown of the treatment system.

82. In determining treatment and final disposal methods for HCW generated in the primary sector, it is important to consider strategies that are practical, cost-effective, and compatible with regional and district vision. The waste could be either (i) treated and safely disposed on-site in each HCF, or (ii) transported to larger facilities in the region where treatment capacity is already installed but under-utilized through an appropriately designed centralized system for collection and transport. Selection of technology and sizing of capacity need to consider volumes of HCW produced, financial and staffing allocations needed, availability of technical backstopping support, and availability of treatment facilities in major hospitals located within a reasonable distance from the primary HCFs are some of the important aspects to consider in evaluating available options. This would require the project to carry out detailed assessments of viable options and hold close consultations with the relevant PDHSs and RDHSs, as well as the DE&OS in the MOH.

2. Health care waste management: Recommendations for complying with regulations

83. It is mandatory to comply with the following regulations:

a. Complying with National Policy and National Guidelines for Health Care Waste Management

84. Provisions of the National Policy on Health Care Waste Management (2001) and National Guidelines for Health Care Waste Management (2001)⁵ should be complied with, and specific HCWM plans should be prepared for each hospital.

b. Complying with National Color Code for Segregated Waste

⁵ Government of Sri Lanka, MOH and Indigenous Medicine. 2001. *Draft Healthcare Waste Management National Guidelines, October 2001*. Unpublished; and Government of Sri Lanka, MOH and Indigenous Medicine. 2001. *Draft National Policy for Healthcare Waste Management, October 2001*. Unpublished.

85. HCFs in the cluster should follow the National Color Code for Segregated Waste (2006).⁶

c. Complying with accepted norms for labelling of segregated waste categories to ensure safety

86. All the hospitals should follow accepted norms used for demarcation of segregated waste categories as per the National Color Code for Segregated Waste (2006) (footnote 2) and WHO norms.

87. Make labelling of waste containers mandatory, which can be used to identify the source, record the type and quantities of waste produced in each area of the HCF, and allow problems with waste segregation to be traced back to a medical area. A simple approach is to attach a label to each filled container with the details of the medical area, the date and time of closure of the container, and the name of the person filling out the label. Using an international hazard symbol⁷ on each waste container is also recommended.

d. Obtaining the environmental protection license

In 2008, the government consolidated the NEA, No. 47 of 1980, by incorporating medical institutions in the list of institutions or activities that require an EPL. The regulations determine the activities set out in the schedule as depicted in Gazette Extraordinary No. 1533/16 dated 25 January 2008, being listed as activities that involve or results in discharging, depositing, or emitting waste into the environment, causing pollution. Such activities for which a license (an EPL) is required—. Item 28 under Part II of the Schedule list in this Gazette lists, Bio Medical and Health Care Waste from Health Care Institution including Medical Laboratories and Research Centres as a prescribed activity that needs a license.

e. Obtaining the scheduled waste license

88. Part II of the National Environmental (Protection & Quality) Regulations, No. 01 of 2008 include “health care service centers generating infectious wastes, including medical laboratories and research centres” as a prescribed activity that requires a SWL.⁹

89. Schedule VIII lists HCW as a scheduled waste from specific sources that no person shall generate, collect, transport, store, recover, recycle, or dispose of except under the license issued by the authority and in accordance with standards and other criteria as may be specified by the authority. These categories include:

- (i) bio-medical and HCW from healthcare Institution, including medical laboratories and research centres
 - (a) S 281 - infectious HCW including laboratory cultures, waste from isolation wards, tissues (swabs), materials, or equipment that have been in contact with infected patients; and human tissues or fluids
 - (b) S 282 - sharps including needles and scalpels;

⁶ Government of Sri Lanka, Ministry of Healthcare and Nutrition. 2006. *General Circular No. 01-12/2006, Ministry of Healthcare and Nutrition, dated 21 March 2006*. Colombo.

⁷ (i) Annex II of the European Commission's Directive on dangerous substances - 67/548/EEC, or (ii) United Nations Economic Commission for Europe's (UNECE's) Globally harmonized system of classification and labelling of chemicals are recommended.

⁹ Gazette Extraordinary No. 1534/18 dated 2008.02.01

- (c) S 283 - biological and anatomical waste, including tissues, organs, body parts, human fetuses and animal carcasses, blood, and body fluids;
- (d) S 284 - outdated and discarded drugs, including cytotoxic drugs and chemical reagents; and
- (e) S 285 - materials and containers contaminated with the above-specified waste.

90. The following SWL should be obtained for HCFs where applicable (note: a permit for multiple operations can be obtained).

- (i) **Categories: Generation and Storage.** All the hospitals in the cluster should obtain multiple SWL for the generation and storage of HCW.
- (ii) **Categories: Collection and Transportation.** The hospital authority who is responsible for collection and transportation of HCW to the hospital where the HCW treatment facility is established has to obtain a multiple SWL for collection and transportation of HCW.
- (iii) **Category: Storage.** The hospital where the HCW treatment facility is established has to obtain a multiple SWL for: (i) generation, (ii) storage (waste generated at the hospital and all the waste it undertakes to process at the treatment facility), and (iii) disposal (waste generated at the hospital and all the waste it undertakes to process at the waste treatment facility).
- (iv) **Categories: Recovery and Recycling.** These two categories may not be applicable in the case of operations of the healthcare waste treatment facility

f. Air emission control

91. If the proposed waste treatment facility is an incinerator, the emissions of such incinerators should comply with the provisions stipulated in Schedule III, Part V and Regulations 14, 15 and 16 of National Environmental (Stationary Sources Emission Control) Regulations, No. 01 of 2019.¹⁰

92. It is very important to operate and maintain the incinerator according to the guidelines provided by the manufacturer to ensure that the air emissions are maintained below the quality limited stipulated in the regulations. The guidelines include the following:

- (i) Operate and maintain the incinerator properly—keep visual records of the nature of emissions and take corrective action as soon as the color of smoke and opacity is abnormal.
- (ii) Use recommended optimum levels of fuel for incineration and recommended waste loads.
- (iii) Make sure that the composition of waste is according to the manufacturer's specifications.

3. Health care waste management: recommendations for complying with public health and safety provisions

a. Proper collection of health care waste at each health care facility

¹⁰ Gazette Extraordinary 2126/36 dated 5 June 2019

93. The format specified Schedule V, Regulation 27 in the National Environmental (Protection & Quality) *Regulations*, No. 01 of 2008¹¹ should be used for maintaining records of the collection, storage, and treatment of HCW. Each HCF should maintain a record of generation and collection (before handing over to the transporter). This information is important in the renewal of the EPL and the SWL, or each HCF. The method of treatment can indicate the details of handing over the waste to the transporter.

- (i) Collection times within the HCF should be fixed and appropriate to the quantity of waste produced in each area of the HCF. General waste should not be collected at the same time or in the same trolley as infectious or other hazardous wastes.
- (ii) Waste bags and sharps containers should be filled to no more than three-quarters full. Plastic bags should never be stapled but may be tied or sealed.
- (iii) Waste bags and containers should be labelled with the date, type of waste, and point of generation to allow them to be tracked through to disposal. Where possible, weight should also be routinely recorded.
- (iv) HCW should be stored appropriately and handed over to the transporter at regular intervals (pre-arranged). Record keeping is the responsibility of each HCF (para. 94).

b. Proper transportation of health care waste to the incinerator

94. The waste collector and transporter should obtain proper SWLs, and the details needed for obtaining these licenses are given in the regulations. The format specified Schedule IV, Regulation 16(b) in the National Environmental (Protection & Quality) *Regulations*, No. 01 of 2008¹² should be used for maintaining records by collectors and transporters of HCW.

c. Collection of health care waste from each health care facility

95. All the HCFs that are served by the central waste treatment facility should be strongly advised to send only infectious waste (highly infectious waste, and pathological and anatomical waste), sharps, chemicals, and thermally destructible pharmaceutical waste.

96. Each HCF should declare what type of waste is contained in each package and approximate weight (this information is needed for their record-keeping as well). There should be a designated person who should take responsibility for the declaration of the contents.

97. The collector should immediately refuse to collect any packages (i) which he presumes contain any mix of waste which cannot be accepted (para. 96); (ii) any packages, bags, containers which are not properly sealed and tied, or any packages which are damaged as there is a risk of spilling while in transit, or any packages which have apparent signs of any leaking; (iii) the transfer sheet is not signed by the authorized person of the respective HCF; (iv) if the packages are not properly marked with a unique identification tag (location of origin, date of packing, weight, etc.); and (v) if any of the packages and bags are heavier than 10 kilograms (kg). The ideal weight of a single package should be around 5 kg.

d. Transportation of health care waste from each health care facility to waste treatment facility

¹¹ Gazette Extraordinary No. 1534/18 dated 2008.02.01.

¹² Gazette Extraordinary No. 1534/18 dated 2008.02.01.

98. A list of all the HCFs shall be prepared from where HCW is collected and transported to the central facility. Decide on the details (for each HCF) required to be included in the application to obtain the SWL to be filled by the collector. The collector is not allowed to collect scheduled waste at locations where he is not authorized to collect (locations which are not included in the SWL).

99. The PDHS should designate a vehicle (or a fleet of vehicles) for the exclusive use of waste transportation. Include the type/s of vehicles and registration numbers for obtaining the SWL. This SWL will serve the purpose of legally transporting the HCW. Then establish a route that will be used for the transportation of the waste. This information must be included for each HCF in the application when obtaining the SWL—to be filled by the transporter. The driver and the helper (if any) should be provided with any appropriate clothing and PPE for handling HCW. They should be given very clear instruction on the procedure and what to be followed in any event of emergency or contingencies. This emergency plan should be included in the application submitted to obtain the SWL.

100. Drivers of vehicles carrying hazardous HCW should have the appropriate training about risks and handling of hazardous waste. Training on the following issues should be included: (i) relevant legal regulations, (ii) waste classifications and risks, (iii) safe handling of hazardous waste, (iv) labelling and documentation, (v) emergency and spillage procedures, and (vi) proper cleaning of the vehicle. In addition, drivers should be declared medically fit to drive vehicles. In case of accidents, contact numbers or details of the emergency services and other essential departments should be carried in the driver's cab. For safety reasons, vaccination against tetanus and hepatitis A and B is also recommended, and vaccination and training details of staff should be recorded.

101. The transport vehicle should be labelled according to the type of waste that is being transported. The label that is displayed will depend on the United Nations classification of the waste. According to the United Nations and WHO requirements, no specific vehicle labelling is required if less than 333 kg, i.e., the “gross, dangerous goods charge” of infectious waste (UN 3291) is transported—although labelling is recommended. However, the National Environmental (Protection and Quality) Regulations, No. 1 of 2008 requires the following:

Every person involved with the management of scheduled waste shall, in addition to any other signs or symbols required under any other law, display a plainly visible notice in Sinhala, Tamil and English, on the (a) site of generation or storage; (b) vehicle used for transportation; (c) containers or tanks used for collection and storage; and (d) disposal sites.

102. Therefore, it is recommended to adopt the recommended signage of the UN 3291—recommended by WHO with Sinhala and Tamil warning signs included.

e. Receipt of health care waste at the central facility for waste processing

- (i) Designate an officer to receive and keep records of HCW received from each HCF, including the records of the Transporter.
- (ii) Details of any waste returns should be recorded clearly, including the reason for returning.

- (iii) Clear instructions for proper waste collection, segregation, and storage should be passed to waste generating HCFs regularly, and information should be maintained properly.
- (iv) This officer should receive feedback from the operator on the presence of any waste items that are not allowed to be incinerated. Stern warnings should be issued to such HCFs, and such warning should be copied to the respective MOH and PDHS. If such incidences recur, do not receive waste from such HFCs.
- (v) The officer should be vigilant of any loose packages and bags or any leaky ones when receiving them. The officer may refuse to accept such packages if circumstances warrant it. If not, the officer should direct the healthcare workers to safely transfer such packages safely to the incinerator site.
- (vi) This officer has to supervise the record-keeping by the operator of the incinerator, and such records should be kept as daily, weekly, and monthly summaries with the officer.
- (vii) The officer should maintain the following records, which are needed for the renewal of the SWL, and also show compliance to regulations (the format specified in Schedule V, Regulation 27 in the National Environmental [Protection & Quality] Regulations, No. 01 of 2008).¹³
- (viii) The hospital where the central waste processing facility is established should make sure that the control strategy for healthcare waste should have the following components.
 - (a) A consignment note should accompany the waste from the HFC, which is the place of production, to the site of final disposal at the central facility. On completion of the journey, the transporter should complete the part of the consignment note especially reserved for him and return it to the waste producer.
 - (b) The hospital where the central facility is established should make sure that the waste is sent for processing and the transporter has proper SWLs if not, accepting scheduled waste from them is not permitted.
 - (c) handling and disposal facilities (incinerator and disposal of burnt ash) at the waste processing site should hold an SWL issued by the CEA, allowing the facilities to handle and dispose of HCW.

4. Health care waste management: recommendations for complying with occupational health and safety

103. The occupational safety of health care personnel and workers handling waste should never be overlooked. Clause 33 of the regulation stipulate puts a strong emphasis on this.

a. For the central waste processing facility

104. The operator of the central waste processing facility should have the appropriate training about the risks and handling of hazardous waste. Training on the following issues should be included: (i) relevant legal regulations, (ii) waste classifications and risks, (iii) safe handling of hazardous waste, (iv) labelling and documentation, (v) emergency and spillage procedures, and (vi) proper cleaning of the premises and the periphery.

105. In addition, the operator should be declared medically fit to operate the central waste processing facility. In case of accidents, contact numbers or details of the emergency services

¹³ Gazette Extraordinary No. 1534/18 dated 2008.02.01.

and other essential departments should be available at the incinerator site. For safety reasons, vaccination against tetanus and hepatitis A and B is also recommended, and vaccination and training details of staff should be recorded.

106. Provide (i) appropriate clothing and PPE for the operator and his assistants who handle HCW, (ii) firefighting equipment (including sand buckets) at the incinerator site, and (iii) proper water supply at the incinerator site and a washroom for the workers to clean themselves.

b. Common for all the HCFs in the cluster

107. Workers at risk from infection and injury include healthcare providers, hospital cleaners, maintenance workers, operators of waste-treatment equipment, and all personnel involved in waste handling and disposal within and outside HCFs. Training in health and safety is intended to ensure that workers know of and understand the potential risks associated with HCW and the rules and procedures they are required to respect for its safe management. They should be informed on the importance of consistent use of PPE and should be aware of where to obtain post-exposure follow-up in case of a needle-stick injury or other blood exposure.

108. Standardized and written HCWM procedures, when respected by personnel and monitored by the hospital management, can dramatically reduce the risk of accidents. Hospital staff should be taught and kept informed about the HCWM system and procedures that are in place. Health care personnel should be trained for emergency response if injured by a waste item, and the necessary equipment should be readily available at all times. Written procedures for the different types of emergencies should be drawn up. For dangerous spills of hazardous chemicals or highly infectious materials, the clean-up operation should be carried out by designated personnel specially trained for the purpose.

109. To limit the risks, hospital management must set up management rules and operating procedures for HCW and establish standardized emergency procedures. It is the responsibility of everybody involved in handling waste to know the emergency procedures and to act accordingly. One person should be designated as responsible for the handling of emergencies, including coordination of actions, reporting to managers and regulators, and liaising with emergency services. A deputy should be appointed to act in case of absence.

5. Proper Storage of health care waste and operations

110. A proper waste storage shed should be built adjoining the waste processing facility and (i) its floor raised above any floodwaters, and the storage area should have an impermeable, hard-standing floor with good drainage; it should be easy to clean and disinfect, (ii) the access to be built up to this storage shed accessible to the transport vehicle, (iii) this storage shed has to have access control and should be kept locked, (iv) it should be provided with water supply for cleaning purposes, (v) there should be properly built drains to collect wash water into a catch pit, and the water collected there should be disinfected prior to disposal to the surrounding area (into a soakage gully), (vi) There should be protected from the sun; however, there should be good lighting and at least passive ventilation.

111. The waste storage shed and the incinerator premises should be fenced, and access to it should be controlled. The storage area and the Incinerator should afford easy access for staff in charge of handling waste and waste transport vehicles. The storage area should be inaccessible to stray animals and birds. Any rodents and insects should be eliminated using rodenticides and insecticides.

6. Suggested Methods to be Adopted for Better Operations and Ensuring Sustainability of Operations

112. The operator of the waste processing facility should be given proper training on preventive maintenance, which refers to regular, routine maintenance to help keep Incinerator up and running, preventing any unplanned downtime and expensive costs from unanticipated equipment failure. (i) A manual prepared for preventive maintenance should be provided (in Sinhala) to the operator. This has to be prepared by the manufacturer of the Incinerator, (ii) a proper checklist for keeping records of preventive maintenance should be maintained and should be made available to the manufacturer when needed.

113. The operational manual should be made available for the operator – ideally prepared in Sinhala. A guide for troubleshooting should accompany the operation manual.

114. Any deviations from the normal mode of operations should be brought to the notice of the authorized engineer/technical officer of the hospital or the PDHS/RDHS – if needed, to be taken up with the manufacturer. This includes visual observation of the quality of smoke emissions, flaring and consumption of fuel, nature of the flame and observations of remain in the burnt ash.

115. Regular maintenance schedules should be carried out as scheduled. Any maintenance needs should be attended to without delays. Any signs of corrosion (especially on the stack) and other steel parts of the shed should be noted, and corrective action should be taken accordingly.

116. Storage space and the incinerator premises should be kept tidy and clean. Appropriate signages should be used to indicate public health hazards posed by the waste processing facility. Storage facilities should be labelled in accordance with the hazard level of the stored waste.

117. Waste management, reasons for failure: Lack of awareness about the health hazards related to healthcare waste, inadequate training in proper waste management, absence of waste management and disposal systems, insufficient financial and human resources and the low priority given to the topic are the most common problems connected with healthcare waste. Though the country has appropriate regulations, its enforcement is weak.

7. Management of Wastewater from Health Care Facilities

118. Health care wastewater in the primary sector consists of (i) black water containing high concentrations of fecal matter, urine, and toxic chemical with high potential for pollution and (ii) greywater containing discharge from washing, cooking, bathing, laundering with low potential for pollution. Sewage generated in HCFs is potentially hazardous and infectious as they carry pharmaceutical chemicals and disease-causing bacteria, viruses, and parasites. None of the institutions in the primary sector considered under the project has piped sewerage, and the sewage is disposed of in septic tanks. There are many risks associated with current sewage disposal practices, especially if septic tanks are not watertight, old, and leaking or if the groundwater table in the area is naturally high, such as (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 into the environment without prior treatment.

119. Mitigation measures for hospital sewage and wastewater are to implement a treatment system. The volumes of wastewater produced in primary HCFs are not significant compared to higher grade hospitals, and the treatment options should be evaluated in a site-specific way during project implementation.

a. Mitigation of impacts by proper implementation of wastewater management systems

120. Together with the wastewater that originates from such sanitary conveniences (blackwater), an adequate system of drainage shall be provided to carry wastewater from all other discharge points and appliances (greywater) within the hospital to a wastewater treatment system with an appropriate form of primary, secondary, and (if needed) tertiary treatment, designed and certified by a qualified engineer. Such treatment systems may consist of any pre-designed and pre-fabricated unit processes, packaged plants, etc. Preliminary treatment of wastewater, where needed, is essential, e.g., providing screens to remove gross solids, grease traps to remove oil and grease and primary treatment such as appropriate chemical treatment and dilution.

121. Disposal of effluent subsequent to treatment should be in compliance with provisions of the National Environmental (Protection & Quality) Act, No. 1 of 2008, and any other regulations as imposed by national and provincial regulations, any regulations imposed by local authorities, or any subsequent amendments to such regulations.

122. To make sure that wastewater generated within the HCF is safely collected, wastewater pipe networks, including traps and water seals, branch discharge pipes and connections, discharge stacks and ventilation pipes, and any other component of the pipe network, must be designed based on the maximum discharge of wastewater. In addition, the design of drains, sewers, manholes, and any appurtenances from buildings to the point of connection to an existing sewer system or a wastewater treatment system should be part of the design. Designs should propose suitable technical measures to protect drains and pipelines from the settlement, provide suitable access points for clearing blockages, rodent and vermin control, and any other foreseeable issues that need regular maintenance during operational activities of the building.

123. Reuse, reclamation and/or recycling of treated or partially treated wastewater for non-human consumption use should only be considered as long as

- (i) it is not prejudicial to the health of any person, persons, or a community; and
- (ii) it will not contaminate any surface watercourse, groundwater, or water supply.

124. After ascertaining safety, in such cases of reuse, reclamation and recycling of treated and partially treated wastewater, separate plumbing and distribution network and storage systems should be suitably designed and constructed. These distribution and storage systems should be clearly identified from drinking water systems, and points where such non-potable water is used, especially the taps, appliances and/or fittings, should be visibly marked.

125. It is required that all types of sludge produced from the treatment plant be handled in an environmentally safe manner, and the designs should take into account the best methods of disposal of sludge with special emphasis on quantity and quality.

b. Contingency plan for any malfunctions of the wastewater treatment facility

126. Contingency measures plans have to be prepared for (i) sewage treatment works that could reasonably be expected to cause significant environmental impacts as a consequence of operational disruption (i.e. maintenance, etc. or breakdown); (ii) discharge of sub-standard wastewater into the environment from the treatment facility which could cause a significant public health impact which therefore requires a continuous system of influent and effluent monitoring to identify potential problems as and when they arise.

127. In the preparation of the contingency measures, the most likely causes of process disruption or breakdown have been identified. The contingency measures are as follows: (i) an attempt has to be made to estimate their probability of occurrence, (ii) the possible resultant environmental adverse impacts should be identified, (iii) the recommended courses of action to minimize the severity of the impacts have to be highlighted, and (iv) the responsible agency who shall act in case of emergencies needs to be indicated.

128. Table 6 gives the potential issues that can arise during operation and maintenance and corrective actions. The major risks which can result in breakdowns and disruptions are described below.

Table 6: Contingency Measures to be Adopted in Operations and Maintenance of the Treatment Facility

The issue to be addressed	Action to be taken
Breakdown or malfunctioning of the wastewater treatment plant	Continuous monitoring of the effluent quality of treated wastewater shall be carried out, and their acceptance shall be notified to the plant operator from time to time. The monitoring parameters and the frequency shall conform to the requirement provided in the environmental protection license (EPL). If the quality of the final treated wastewater is not acceptable, an immediate need to shut down the waste water treatment plant (WWTP) shall be anticipated. Until the final quality of the treated wastewater is acceptable, no effluent shall be discharged and pumped. A proper communication channel shall be worked out to initiate action during such incidences if any, and all the occurrences and corrective action are taken shall be recorded for rectification purposes.
Failure of pumps	Stand-by pumps should be made available so that there shall be no issue arising to cause a complete stoppage of the treatment plant. Hence this type of failure seems to be manageable, although the frequency of occurrence is remote. However, preventive maintenance for all pumps is recommended to be carried out to ensure trouble-free operations.
Power failures	In the case of power failure, plant operations should not be interrupted. Stand-by generators with adequate capacities, equipped with automatic changeover switches, shall be provided so that risk of failure be minimal.
Accidental bursts of pipeline	The pipe material shall be selected in such a way that it withstands imposed and dead loads and internal build-up of pressure (nominal range with an acceptable factor of safety) to withstand pipe bursts, and fixtures are designed so that the joints are leak-proof. Since collector sewers and laterals are small-diameter short pipelines which are connected to manholes and gulleys, there shall be no pressure build-up within these gravity-flow pipelines. The effluent discharge main shall carry treated effluent from the treatment plant to the outfall, which should be a short pipe in length, in which high pressures are not anticipated. However, subsequent haphazard excavation work may damage the pipes, and, in such case, pumping should be controlled or totally stopped until repair work is done. Any leaks or overflows of untreated wastewater shall be cleaned immediately, and the area shall be disinfected immediately, using chemicals

The issue to be addressed	Action to be taken
Effects of natural disasters on the collection of wastewater and operation of the treatment plant	The pipelines may span over areas vulnerable to flooding, but since they are buried with proper compaction, flooding shall not affect the integrity and stability of the pipeline. Piping should be fully sealed so that infiltration shall be not anticipated. Fire damage is not a risk for the pipes as the entire pipeline is buried underground.
Failure of the outlet structure	Accidental damages of the outlet structures may occur during regular maintenance, flood events, borrow animals or by debris, as the outlet structure may be buried or lie underwater. Periodic under-water observations are therefore recommended to be adhered to. Such observations should be examined by the maintenance staff for structural integrity, and if deformities are observed, immediate repair work shall be undertaken.
Accidental release of partially treated wastewater	It is usually expected that no partially treated wastewater is discharged through the outlet structure, but if it happens, people downstream should be informed so that they should be prevented from the use of water, including bathing. Until the conditions are brought back to normalcy, the affected population should be kept informed, and the impact zone shall be demarcated to avoid any activities causing health hazards.
Sabotage and willful damage to pipes and treatment units	There shall be a risk of sabotage, perhaps in the areas where the pipeline is laid on the surface or above the existing ground. For example, across the culverts, there may be aboveground pipes where air-release valves may be fixed. Such fixtures may be vulnerable to acts of sabotage, and such sensitive areas must, therefore, be checked on a periodic basis. A logbook must be maintained to notify such damages, and actions should be taken to avoid such situations as practical as possible.
Asphyxiation hazards during maintenance	In the case of repairs, workers may open the pipe fixtures for observations. In such a case, gases trapped, if found, may cause asphyxiation hazards causing even difficulties in breathing. Hence, personal protective gears suitable for such incidents shall be provided, without which any repair work should not be undertaken.
Accidents in the treatment plant and the pump house	Accidents may occur in the pump house if not maintained well. An operation manual encompassing the accidental preparedness plan shall be kept in the location where the treatment plant and pumping units are housed. All operators shall be given training and awareness sessions to make them prepared to handle such situations pragmatically.

8. Maintenance of the new vehicle fleet including ambulances

129. The newly added vehicle fleet including ambulances under JFPR should be properly maintained if they are to provide a service for a long period. These vehicles should be serviced as instructed by the manufacturers and any repairs should be immediately attended to avoid any permanent breakdown of the vehicle.

9. Environment, health, and safety measures to be taken related to the generation, storage and usage of medical oxygen

a. Fire protection

130. In the rooms where they are located, the oxygen concentrators and oxygen compressors shall be fitted with fire suppression systems, including smoke detection and sprinkler systems.

Typically, the primary fire protection for generators is from fire hydrants. Depending on the system size, there shall be an adequate number of fire hydrants, chemical-type fire extinguishers, hoses, or a combination of these that should be strategically located close to the oxygen concentrator units, compressors, and boosters so that a fire can be approached from any direction.

131. Oxygen compressor fires typically produce high-velocity oxygen jets containing molten metal and metal oxides. Protective barriers should be used to isolate oxygen compression equipment to protect personnel and other equipment in case of a fire.

132. Some oxygen concentrator units can have specific equipment that necessitates consideration, such as a refrigeration system using a hydrocarbon refrigerant. In these cases, the appropriate provisions of international codes shall be followed for fire protection.

133. Automatic isolation valves and emergency remote shutdown shall be used to prevent oxygen sources from feeding a fire.

134. The following specific measure should be followed at all times:

- (i) Storage of flammable and combustible materials should be avoided in buildings housing oxygen supply systems and shall be in accordance with fire regulations.
- (ii) Ensure appropriate fire extinguishers are kept nearby and are regularly inspected.
- (iii) Keep oxygen cylinders at least several meters from a heat source, open flames, electrical devices, or other possible sources of ignition.
- (iv) Put a "no smoking" sign near oxygen sources in the hospital.
- (v) Check that all nearby electrical circuit breakers and devices are in safe working condition and free from sparking to prevent a serious fire occurrence.

b. Occupational safety

135. Sufficient space shall be maintained around the equipment to allow for personnel access for maintenance.

136. Personnel protection such as guard rails, platform gates, and ladder enclosures should be provided to prevent falls from elevated locations.

137. Specific means shall be provided to protect the personnel in case of an emergency. Example of this includes emergency lighting, emergency remote shutdown, safe multiple exit routes, fire retardant clothing, alarm systems, and equipment isolation valves.

c. Materials of construction

138. Materials of construction shall be carefully selected according to existing codes and standards, ensuring their compatibility with oxygen for medicinal use, and depending on the service pressure and gas velocity at the different steps of the process

139. Non-metallic materials, including gaskets, valve packing, and compressor piston rings, shall be compatible with oxygen service for medicinal use, considering the risks of toxic products release in case of combustion or overheating.

140. Lubricants likely to be in contact with oxygen shall be compatible with oxygen.

d. Electrical requirements

141. Electrical equipment shall comply with the applicable national codes.

142. The reliability of the electricity supply shall be specifically reviewed. There shall be a backup electrical supply such as an emergency generator.

143. The level of isolation of the electrical supplies to primary and secondary oxygen supply sources shall be established by risk management to implement the appropriate level of independence required to ensure supply continuity.

144. In areas where oxygen enrichment is likely to occur, electrical equipment with open or unprotected make and break contacts should be avoided. Generally, the location of electrical equipment inside such areas should be avoided to eliminate potential hazards.

e. Emergency shutdown system

145. An emergency shutdown system is required. The system shall be designed to permit shutting down the concentrator from one or more locations by tripping the appropriate switchgear to disconnect power. Local regulations may specify additional requirements for emergency shutdown.

f. Automatic operations

146. Precautions shall be taken to ensure that equipment cannot be automatically re-started without the knowledge of personnel in the area around the equipment. These precautions include but not limited to:

- (i) a lock-out procedure before the commencement of any work, including maintenance; and
- (ii) warning signs (visual and audible alarms) indicating the potential of the automatic restart of the supply system.

g. Noise

147. The noise produced by the oxygen supply system, including air and oxygen compressors, adsorber vessels, vents, and pressure relief valves, shall be considered for the potential hazard or nuisance to employees, patients, as well as to neighboring areas. Noise abatement and use of personnel ear protection shall be in accordance with national and local regulations.

h. Venting

148. An oxygen supply system will produce a significant volume of waste gas (oxygen-depleted air or oxygen-enriched air) likely to create oxygen-deficient atmospheres or oxygen-enriched atmospheres in the surroundings of the gas vents. The use of signs warning of asphyxiation and oxygen enrichment should be considered. In addition, dust material from the adsorber beds is an irritant and can also be present in the waste gas vent.

149. All vents shall be directed to a safe location outside of the buildings, away from personnel and equipment. Consideration shall be given to reduce the noise to an acceptable level according

to local legislation. The inlet to an air conditioner is an example of a location where discharge shall be prohibited.

150. Pressure relief valves shall be located so that their discharge cannot impinge on personnel or other equipment. They should not discharge into working or operating areas frequented by personnel.

151. Pressure relief devices (PRDs) located outside should have discharge outlets protected from weather and water freezing. Vents shall be unrestricted.

152. Vents shall be routed and protected from damage by other nearby activities such as vehicular traffic.

i. Dusting

153. In order to ensure that the particle level in the gas supply from an oxygen concentrator unit is maintained below the level specified in EN ISO 7396-1, a filtration system shall be used.

154. The filtration system shall be located downstream of the adsorber vessels in order to prevent any release of molecular sieve dust. It shall be designed such that breakthrough of any part of the system will not result in particulates entering the pipeline. This can be achieved by installing a double filter.

155. The pressure differential across the filtration system shall be monitored to ensure that it is operating effectively and that the adsorbers do not deteriorate.

j. Fluid discharge and solid disposal

156. Considerations shall be given to the disposal of the different waste materials generated during the life of the oxygen supply system. These include

- (i) condensates from the dryer, as it may contain small quantities of oil;
- (ii) spent zeolite (molecular sieve) after replacement;
- (iii) filter elements;
- (iv) lubrication oil used in the compressors; and
- (v) coolants.

157. The maintenance procedures shall consider potential hazards for the personnel handling any waste material, according to the relevant Safety data sheets.

k. Air compression and filtration

158. A drying and filtration system shall be installed downstream of the air compressors to ensure the delivery of dry and oil-free air at the inlet of the adsorber vessels. The drying system design shall prevent any contact of the coolant with the gas in normal and single-fault condition.

159. Operating gas temperature and pressure shall be monitored at each stage of compression, with alarms and automatic shutdown in case the thresholds are reached.

160. Wherever possible, high-grade lubricants and oils should be used. Appropriate means shall be included in the concentrator units design to ensure that the oxygen oil content is within

the limit specified in the local country Pharmacopoeia Monograph for oxygen. European Pharmacopoeia Monograph (EP 2455)⁸ can be referred to in the absence of a local country pharmacopoeia.

I. Hazards involved in Oxygen compression

161. Additional hazards linked to the compression of oxygen are the ignition of materials due to a temperature increase caused by

- (i) mechanical friction due to malfunction of the compressor;
- (ii) particle impingement leading to localized high temperature; and
- (iii) adiabatic compression.

162. The main consequences of such ignition can be a loss of containment and projection of molten metal at high pressure and a release of a toxic combustion by-product.

163. Therefore, such hazards shall be mitigated by the following measures:

- (i) monitoring of the compressor operating conditions, including gas pressure and gas temperature, with automatic shutdown and alarms when the threshold is exceeded;
- (ii) confinement of the compressor inside a dedicated enclosure;
- (iii) the correct selection of materials used within the compressor, including non-metallic materials, cleaning agents, lubricating oils; and
- (iv) carbon monoxide and carbon dioxide analysis downstream the compressor to detect any release of combustion by-products

m. Product storage

164. The hazards associated with the storage of oxygen depending on the conditions under which they are stored. Each storage system shall be suitable for the temperatures, pressures, and fluids involved.

- (i) Low-pressure vessels
 - (a) Buffer vessels used for air and oxygen shall be designed, manufactured, marked and tested in accordance with the requirements of the relevant national codes and standards.
 - (b) The pressure vessels shall be installed, tested, and protected by relief device(s) in accordance with the applicable local regulations, codes, and standards. Vessels should be internally inspected for cleanliness before being placed in service.
- (ii) High-pressure vessels
 - (a) High-pressure vessels shall be constructed in accordance with international and national requirements and shall have in place an in-service inspection regime.
 - (b) Consideration shall be given to the potential risk of material fatigue due to the frequent pressurization of the high-pressure steel vessels.

⁸ <https://www.edqm.eu/en/european-pharmacopoeia-ph-eur-10th-edition>.

n. Plant piping

165. Piping systems shall be suitable for the temperatures, pressures, and fluids involved. These should consider the applicability of applicable local regulations, codes and standards.

166. Medical gas pipelines shall comply with EN ISO 7396-1.

167. PRDs should be provided on any system that can be over-pressurized. PRDs should be tested periodically to ensure functionality and that the design set pressure is correct.

168. A pressure reducing station is required whenever the produced and/or stored product pressure is higher than the pipeline distribution pressure.

169. A PRD should be installed on the low-pressure side of the reducing station if regulator failure can allow pressure to exceed the user's maximum allowable working pressure.

170. **System isolation.** Isolation capability should be included at readily accessible points or branches of the lines for test purposes, maintenance, and in the event of a system failure or fire.

171. **Aboveground piping.** Lines installed aboveground shall be supported in accordance with applicable piping standards. Expansion joints or loops should be used as necessary to compensate for expansion and contraction due to temperature changes. Piping systems should be separated from external sources of heat, mechanical damage, and excessive vibration. Piping layouts should avoid tripping and/or bumping hazards.

172. **Underground piping.** Lines installed underground should not be of threaded or flanged construction. Lines shall be adequately supported to prevent damage. In all cases, sufficient flexibility should be provided by piping loops or expansion joints to compensate for the expansion and contraction due to temperature changes. External coating material should be used on the line to minimize ground-induced external corrosion. Where underground lines pass under roadways, they should be encased in pipe sleeves that are vented to the atmosphere. Where underground conditions warrant, cathodic protection should be used.

173. **Insulation.** Measures shall be in place to either protect personnel or make them aware of either hot or cold surfaces. Insulation should be used to help prevent the freezing of moisture in-process and instrument lines, including those in compressed air service that can be exposed to cold ambient conditions. Insulation should be used to prevent condensation from the cold process, instrument lines, or both that can cause slippery conditions.

o. Monitoring of oxygen and medical gas leaks

174. The hospital should frequently and consistently monitor the gas delivery, production, storage and conveyance systems for any leaks. If there are any leaks, they should be attended to by competent personnel as soon as possible—as a matter of urgency. Once a leak is detected, all the safety precautions listed in the sections above should be taken until the leak is arrested and properly repaired.

175. **In the event of a gas leak or suspected leak.** As a basic safety precaution, turn off all naked flames and eliminate all sources of ignition but do not turn electrical switches on or off. If the leak is indoors, open all windows and doors to disperse the gas. In the case of cylinders, disconnect the cylinder and move it outdoors to an open area.

176. Appropriate detection methods and instrumentation shall be adopted (mandatory requirement) to detect oxygen leaks.

10. Provision of continued supply of power, water and telecommunication facilities

177. The HCF and its facilities have to be supplied by a reliable electricity connection, water supplies, and telecommunication facilities. There should be sufficient water storage which is sufficient for at least 1.5 –2 days and a standby generator as backup power. Telecommunication facilities will include wired as well as wireless communication devices and services.

178. Therefore, the chances of a breakdown of power, water and telecommunication facilities will be remote. The only concern is the breakdown of power, for which a contingency plan shall be devised, secure temporary generators until the power supply is restored. However, if any patients, drugs, samples, reagents, cultures, etc., need to be removed due to the unavailability of air-conditioning, gas supplies or chilled/cooling, such patients and material will be transferred to suitable locations without delay.

Table 7. Anticipated Impacts and Mitigation Measures During Operational and Maintenance Phases

Impact Field	Potential environmental issues/impact	(a) Likelihood of occurrence (b) Level of impact	Recommended mitigation measures
General maintenance of facilities	<p>Any lapses in maintaining the facilities will lead to environmental damage (this is specifically valid for [i] wastewater treatment facilities: effluent and sludge disposal; [ii] healthcare waste management facilities: air emission control and bottom ash handling, waste storage controls, and leachate collection and treatment; and [iii] stormwater and drainage canals).</p> <p>Maintenance activities may cause disturbance to sensitive receptors due to waste emissions, air emissions and dust, increase in noise level, dredged material, leachate, etc.</p>	<p>(a) Likely to occur</p> <p>(b) High</p>	<p>Disposal of treated effluent subsequent to treatment should be in compliance with provisions of the National Environmental (Protection & Quality) Act, No. 1 of 2008, and any other regulations as imposed by national and provincial regulations, any regulations imposed by local authorities, or any subsequent amendments to such regulations.</p> <p>If the proposed waste treatment facility is an incinerator, the emissions of such incinerators should comply with the provisions stipulated in Schedule III, Part V and Regulations 14, 15 and 16 of National Environmental (Stationary Sources Emission Control) Regulations, No. 01 of 2019 (Gazette Extraordinary 2126/36 dated 2019.06.05).</p>
Deterioration of air quality, air emissions and odours	<p>The odour from wastewater treatment plants, pump stations, (healthcare) solid waste transfer stations, final collection, and waste management facilities will cause a nuisance to the neighbourhoods.</p> <p>Air pollution can occur due to gaseous or volatile chemicals used for disinfection processes at the wastewater treatment plants, gaseous emission from incinerators (especially furans and dioxins), and solid waste management facilities—if not mitigated properly. Air emissions from waste treatment operations (both wastewater and solid waste) may include hydrogen sulfide, methane, ozone (in the case of ozone disinfection), volatile organic compounds, gaseous or volatile chemicals used for disinfection processes (e.g., chlorine and ammonia), and bio-aerosols. Odours from treatment facilities (including mercaptans) can also be a nuisance to workers and the surrounding community.</p>	<p>(a) Likely to occur</p> <p>(b) High</p>	<p>No bad odour shall emit from the treatment plant to the nearby buildings. A proper ventilation system shall be necessary in order to expel noxious gases without any inconvenience to the neighbouring buildings.</p> <p>Incinerators designed for HCW should operate at temperatures between 900°C and 1,200°C.</p> <p>Optimal combustion conditions are essential if there is to be an almost complete destruction of wastes without the generation of significant amounts of harmful solid, liquid, or gaseous outputs (e.g., dioxins and furans). The burning temperature, waste residence time inside the furnace, gas turbulence, and size of airflow inputs is therefore critical, and the incinerator should fulfil the design criteria (e.g., the temperature in the post-combustion chamber</p>

Impact Field	Potential environmental issues/impact	(a) Likelihood of occurrence (b) Level of impact	Recommended mitigation measures
			should reach at least 900°C and gas residence time should be at least 2 seconds; and air inflow with 100% excess oxygen and high turbulence should be ensured)
Water pollution	If the treatment systems and facilities malfunction, deterioration of the surface and groundwater quality from wastewater collection and disposal and untreated leachate from the HCW facility and bottom ash disposal and stormwater discharges can occur.	(a) Likely to occur (b) High	Wastewater treatment, leachate treatment, sludge treatment, effluent disposal, and all other waste management systems must meet national effluent discharge standards specified by the CEA, IFC and the SLSI or better standards.
Handling of hazardous chemicals	Wastewater treatment (including leachate treatment) involves the use of chemicals for coagulation (if needed) and disinfection and may need proper handling and storage. Waste treatment facilities may also store and handle lubricants and other chemicals, paints, solvents, etc. Fuel storage is needed for incinerators, which need careful storage and handling.	(a) Less likely to occur (b) Moderate	Procedures for the safe handling of chemicals should be established, and proper training should be provided for plant operators. Accident prevention measures should be established. Operators should be provided with safety gear when chemicals are handled.
Increased amounts of solid waste generation	Solid waste residuals, which may be generated by the waste management functions, and wastewater treatment facilities that include residual waste, leachate, sludge, process residuals, used filtration membranes, spent media, and miscellaneous wastes may need proper collection, treatment, and disposal. Process residuals primarily consist of settled suspended solids from source wastewater and leachate treatment plants and chemicals added in the treatment process.	(a) Likely to occur (b) Moderate	Proper handling of sludges and other waste treatment-related solid waste should be part of the overall design of operation and maintenance of facilities.
Increased levels of noise and vibrations	Sensitive receptors (hospital facilities, schools, temples, etc.) may be affected due to the operation of pumps, generators, etc. and by increased traffic and related impacts. Disturbance from after-hours work of facilities may affect the neighborhood.	(a) Likely to occur (b) Low	Noise abatement measures should be adopted as appropriate.

Impact Field	Potential environmental issues/impact	(a) Likelihood of occurrence (b) Level of impact	Recommended mitigation measures
Loss of biodiversity, fauna, and flora	Depending on the locality of the project area and nature of the project, there can be areas where the ecological environment within the project area is affected during subsequent operations and maintenance works. This is specifically applicable to healthcare waste management sites and wastewater treatment plants, and areas of disposal of effluent. Design failures and improper operations and maintenance of facilities may lead to malfunctioning of facilities and subsequent damage to the ecological environment. This is specifically applicable to healthcare waste management sites and wastewater treatment plants, and areas of disposal of effluent.	(a) Less likely to occur (b) Low	Most of the proposed developments may take place within existing hospital premises where there is a built environment and physical infrastructure already in place. The selection of project areas should focus on finding locations that are not areas of ecological diversity. This is especially true for lands selected for putting up waste treatment facilities and final disposal of treated effluents. Planting of new trees will provide cover to the treatment plants and would act as noise, dust, and smoke barriers. At the same time, tree canopies will cover the treatment plant structure, thereby providing visually pleasing vistas.
Health and safety	The risks of operations and maintenance-related injuries and the safety of workers and the general public must be ensured. Exposure of workers to hazardous materials during the operation of healthcare waste and wastewater treatment plants and sanitation facilities should be minimized. Poor waste management practices and unhygienic conditions at the facilities can cause public health-related issues, especially the spread of diseases. Leaking sewers and septic tanks can damage human health and contaminate soil and groundwater. Leachate from healthcare transfer stations and storage chambers can cause a nuisance to the neighborhoods, apart from the environmental pollution that it causes. Stagnant water due to inadequate stormwater drainage systems and inadequate waste management practices pose a health hazard by providing breeding grounds for disease vectors such as mosquitoes, flies, and rats.	(a) Likely to occur (b) High	Safe handling of HCW during collection, storage, transportation, treatment, and disposal of HCW is of paramount importance. Designs and plans for such safe handling and disposal of HCW have to plan early.

V. ENVIRONMENTAL ASSESSMENT FOR SUBPROJECTS AND COMPONENTS

A. Environmental and Social Safeguards Screening and Categorization

179. All HCFs strengthened under the project will be screened to assess the nature and extent of potential environmental and social impacts. The general subproject selection will be guided by the following criteria for environment and social safeguards:

- (i) Subprojects with significant adverse impacts on the environment (category A), including highly complex and sensitive project will be excluded.
- (ii) Subprojects with significant impacts on involuntary resettlement and indigenous peoples (categories A and B) will be excluded.
- (iii) Subprojects with activities described in ADB's Prohibited Investment Activities List (Annexure 4) will also be excluded.

180. Environmental guidelines for subproject selection in Table 8 provide further guidance to avoid or minimize adverse impacts during the selection of subprojects.

Table 8. Environmental Guidelines for Subproject Selection

Component	Environmental Guidelines for Subproject Selection
Overall (Applicable to all Subprojects)	Comply with relevant national, and local laws, rules and regulations regarding EIA, environmental protection, pollution prevention (water, air, noise, solid waste, etc.), core labor standards, physical cultural resources, and occupational and community health and safety.
	Comply with ADB SPS.
	Avoid land acquisition and involuntary resettlement and have no impacts on Indigenous Peoples.
	Conduct environmental compliance audits for existing facilities that are considered for expansion or upgrading and has potential impacts on environment (per ADB SPS).
	For subprojects with possible asbestos-containing materials which will be affected by the project through demolition works, engage competent person/contractor to undertake survey, prepare asbestos risk assessment and management plans, and undertake the demolition works.
Sewerage System	Follow best available techniques and best available practices as prescribed by the WHO and Stockholm Convention.
	Conduct environmental compliance audits for existing facilities that are considered for expansion or upgrading and has potential impacts on environment (per ADB SPS).
	Subprojects will be limited to renovation of existing sewerage systems or building new systems within existing government hospital facilities.

Incinerators and other solid waste management	Avoid cutting trees, and if unavoidable, replant 3 trees for every tree lost.
	Follow best available techniques and best available practices as prescribed by the WHO and Stockholm Convention. (i.e. operation and management practices, waste input and control, combustion, flue gas treatment, solid residues, effluent treatment, etc.)
	Conduct environmental compliance audits for existing facilities that are considered for expansion or upgrading and has potential impacts on environment (per ADB SPS).

ADB = Asian Development Bank, EIA = Environmental Impact Assessment, SPS = Safeguards Policy Statement, WHO = World Health Organization.

181. The subprojects will be categorized following ADB's classification system to reflect the significance of a subproject's potential environmental and involuntary resettlement impacts.

- (i) **Environmental impacts.** A subproject's category is determined by the category of its most environmentally sensitive component, including direct, indirect, cumulative, and induced impacts in the subproject's area of influence. Each proposed subproject will be scrutinized as to its type, location, scale, and sensitivity and the magnitude of its potential environmental impacts. Subprojects are assigned to one of the following three categories: (i) Category A. A proposed subproject 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. (ii) Category B. A proposed subproject 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. (iii) Category C. A proposed subproject is classified as category C if it is likely to have minimal or no adverse environmental impacts.
- (ii) **Involuntary resettlement impacts.** Like environmental impacts, a subproject's involuntary resettlement category is determined by the category of its most sensitive component in terms of involuntary resettlement impacts. Subprojects are assigned one of the following three categories: (i) Category A. A proposed subproject is classified as category A if it is likely to have significant involuntary resettlement impacts. (ii) Category B. A proposed subproject is classified as category B if it includes involuntary resettlement impacts that are not deemed significant. (iii) Category C. A proposed subproject is classified as category C if it has no involuntary resettlement impacts. The involuntary resettlement impacts are considered significant if 200 or more persons will experience major impacts, which are defined as (i) being physically displaced from housing, or (ii) losing 10% or more of their productive assets (income generating).

182. Each subproject will be screened using the environmental and involuntary resettlement screening checklists provided in Annexure 5. These checklists have been built on ADB's REA checklist for buildings and consists of two parts: Part I focusing on construction-related

environmental impacts and Part II focusing on HCW-related impacts and involuntary resettlement screening checklist.

183. Environment category B subprojects will require the preparation of an IEE including an EMP, while environment category C subprojects will require a desk review of environmental implications.

B. Environmental Assessment

184. An IEE has been prepared as part of project preparation for subprojects and interventions proposed under additional financing, which covers the apex base hospitals in the nine districts in the four provinces, provision of medical oxygen and ambulance facilities. The findings of the IEE provide a good overview of the type and extent of environmental issues to be expected for project-related activities that will be developed during project implementation. The IEE includes a comprehensive EMP and environmental monitoring plan, and clear institutional arrangements for implementing them which can guide the preparation of site specific IEEs and EMPs during project implementation.

185. Given the limited scale of physical infrastructure proposed to be built at each HCF level, which would basically involve rehabilitation and/or expansion of existing services, standardized constructional designs, and the general geographical setting of these facilities (usually centrally located in built-up areas of small townships with moderately high population density), almost all the subprojects will be either environmental category B or C. ADB will review and confirm the subproject environmental categorization as well as the screening recommendation.

186. For category B type of subprojects, IEE reports will be prepared using data collected through field visits, discussions and interviews, and the checklist attached to this EARF. If warranted, due to the occurrence of significant unanticipated environmental impacts from a specific subproject, the PMU will prepare an EIA, although this is highly unlikely. ADB would require the IEEs to include a comprehensive EMP that will specify (see Annex 6 for the contents of an EMP) environmental management measures required to mitigate negative impacts and enhance positive impacts, environmental monitoring requirements, institutional arrangements, and budgetary requirements for EMP implementation. The EMPs will mandatorily form a part of the bidding documents. The HCWM plan will be part of the overall EMP. For practical reasons, the HCWM plan will be developed as a separate document and will not be included in the bidding documents.

187. The scope of the IEE may ideally cover more than one subproject, as has been done in the previous IEE reports submitted during rounds 1 and 2 of the civil works under the HSEP, as it would be too cumbersome to conduct IEEs for each facility. In fact, it is recommended that an umbrella IEEs are carried out covering all HFCs improved in one province.

188. As stated in para. 52 of this EARF an environmental compliance audit is required for upgrading or expansion of existing facilities. Annexure 5.3 includes a guideline in presenting such environmental compliance audit report. Such compliance audit shall be carried out for any upgrading or expansion of an existing facility and submitted along with the environmental screening checklist for the given sub project.

189. Given the nature of the project, it is unlikely that any of the subprojects would warrant an environmental clearance from the CEA. However, in the rare instance it does so, the PMU shall comply with the national requirements in addition to that of the ADB. However, subsequent

operation of wastewater treatment plants and health care waste management systems may need to obtain required licenses.

C. Review of Environmental Assessment Reports

190. The environmental and involuntary resettlement screening checklists will be filled by the PIU at the province level assisted by PMU. Finalized screening checklists with the classification of each subproject will be submitted to ADB Sri Lanka Resident Mission for review and approval. The IEEs will be prepared by the PMU and forwarded to ADB for review and endorsement. In instances where national environmental clearances are needed, the IEEs will be sent to the relevant agency for their approval.

VI. CONSULTATION, INFORMATION DISCLOSURE AND GRIEVANCE REDRESS MECHANISM

A. Consultation and Participation

191. Meaningful stakeholder consultation has been held during project preparation and will continue throughout project implementation. Stakeholders consulted during the preparation of the EARF include officials of the MOH, provincial and regional health services, health workers of a sample of primary care facilities, and patients using these facilities. Stakeholder consultations allow opportunities to incorporate the needs and views of the stakeholders, including the vulnerable, and in the final subproject design and mitigation measures, raise implementation issues and enhance the 'ownership of the project'. Meaningful stakeholder involvement and participation in decision making contributes to project sustainability. A list of people met during consultations shall be provided as an annex to each IEE Report.

192. The key stakeholders to be consulted during project screening, assessment and implementation under the project include staff of the HCF, staff of regional and provincial health services, patients seeking treatment in the HCF, other government bodies, nongovernment organizations (if any), and local communities. Consultations must be carried out in a free and friendly environment in a culturally appropriate manner and could be done through formal/informal meetings, focus group discussions, and interviews as deemed suitable. It is important for consultations to encourage participation of women and vulnerable persons and engage as many relevant stakeholders as possible. It is also important to document outcomes of all consultations and stakeholders met, time, and location.

193. The consultation process carried out so far has solicited views and information from medical and nursing staff of HCFs, staff of the regional/provincial directorates of health services and patients. The information thus obtained, where relevant, has been incorporated into the EARF and the IEE.

B. Information Disclosure

194. Information has been disclosed through public consultations and posting in public locations. The EARF and IEEs prepared for HSEP have been disclosed on project and ADB websites. For the additional financing, information disclosure will continue, and the following documents will be submitted to ADB for disclosure on its website: (i) IEEs; (ii) a new or updated IEE and corrective action plan prepared during project implementation, if any; and (iii) environmental monitoring reports.

195. The executing agency shall send written endorsement to ADB for disclosing these documents on ADB's website. The executing agency will also provide relevant safeguards information in a timely manner, in an accessible place and in a form and language(s) understandable to affected people and other stakeholders.

C. Grievance Redress Mechanism

196. A project-specific grievance redress mechanism (GRM) has been established to receive, evaluate, and facilitate the resolution of the affected person's concerns, complaints, and grievances about the social and environmental performance at the level of the project. It is important that the GRM is established before any site works commence.

197. The GRM of the project has been prepared and accepted by ADB and disclosed in the project website. The GRM chart providing information on receipt of complaints and levels of redressal is displayed in all subproject sites, PIU offices, and other important places. The PIUs records all grievances received and address them on priority. To date all grievances are addressed at the stage of first tier.

198. The ongoing GRM is structured to have two tiers as defined below and is shown in Figure 1. As on the present project the grievance redress committee (GRC) shall be appointed and established before the commencement of construction site works, and the design and supervision firm shall be briefed on the GRM system for the HSEP. Only written grievances (format for such is attached in the project administration manual) will be forwarded to the GRC, who will call a hearing, if necessary, with the complainant. The process will facilitate resolution through mediation. The GRC (both at PIU or PMU levels) will meet as required and direct the field level with clear instructions and responsibilities to attend to the agreed actions within one to two weeks of the meeting. If the grievance is related to construction, the contractor will sit in the GRC as an observer.

199. Levels of GRM resolution include the following.

- (i) **Tier 1.** The PIU at the provincial level will be the first level to resolve grievances. The Deputy Project Director (DPD) will be the focal point for grievance redressal and will act as the chairman of GRC. Its members will include the respective district regional director of health, the social and responsible environment officers from the PIU (secretary to the committee), one nominated officer from the provincial council, and a representative of the community.
- (ii) **Tier 2:** The DPD at the PIU, in consultation with the environmental specialist and social safeguards specialist, or any other relevant official of the PMU, will activate the second level for grievances that are not resolved at tier 1. In addition, via an officer of the local authority, chief secretary, Grama Niladhari, construction site office or directly by a community member or any other individual can also directly report a grievance to tier two. The GRC at the PMU level (second tier) will be headed by the project director of HSEP (Chairman of the committee), and its members will include: DPD (Planning) of the MOH, a nominated representative of Chief Secretary of the respective province, DPD of the respective province, environment officer and social safeguards officer (Secretary to the committee) and a representative from the respective community.

200. The GRM will not impede the affected person's decision to use the legal system at any time.

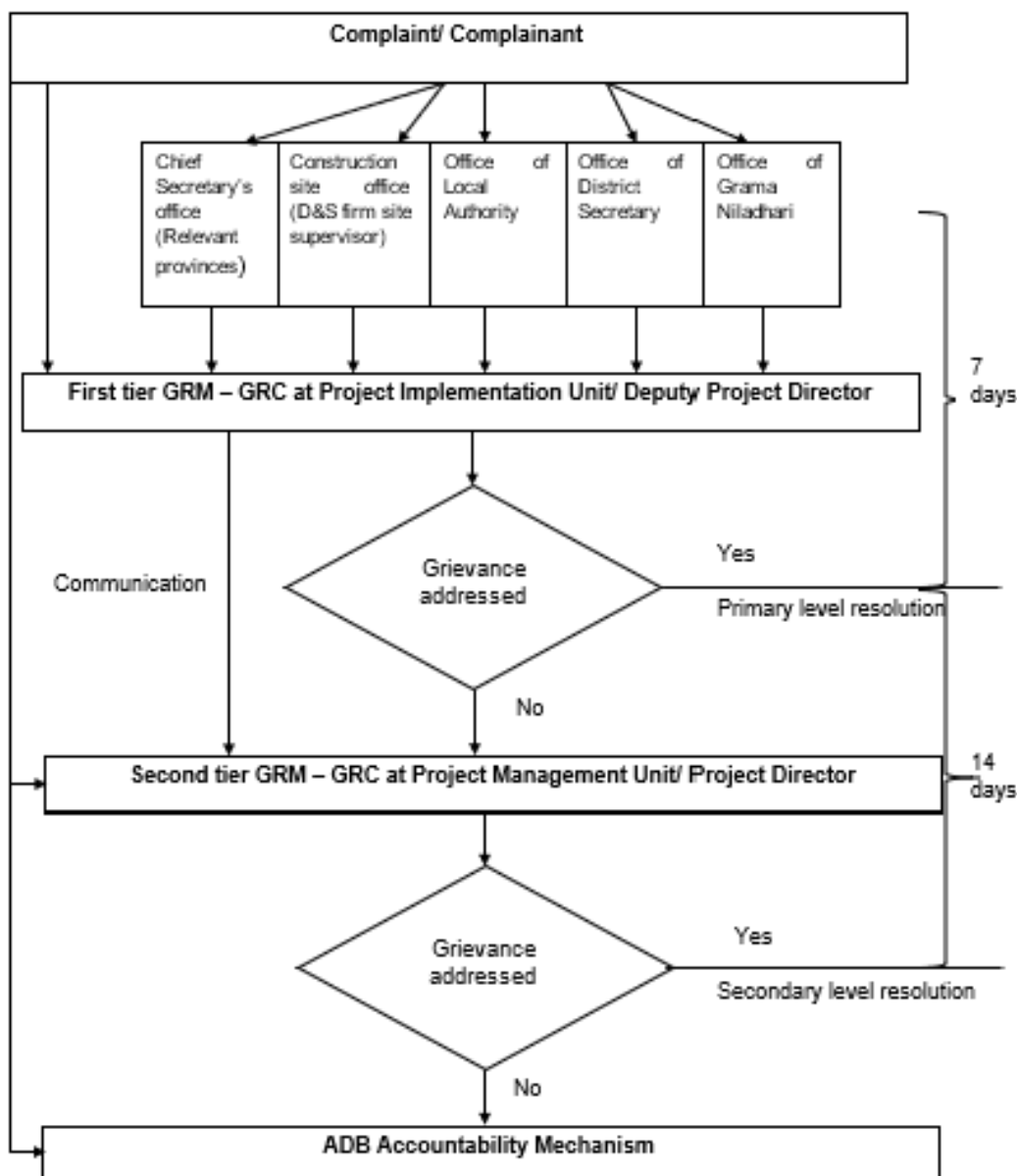
201. On receiving a grievance (via an office of the local authority, chief secretary, Grama Niladhari, construction site office or directly by a community member or any other individual), the PIU or the PMU will:

- (i) enter the grievance in the complaints register of the respective PIU or the PMU;
- (ii) open a grievance file for the specific case;
- (iii) maintain records of the GRC meetings; and
- (iv) close the grievance by filling a closure sheet that will be signed by the complainant agreeing that the concern has been satisfactorily resolved.

202. Grievances will be attended to within a week based on on-site investigations and consultations with relevant parties. All grievances will be properly recorded with personal details unless otherwise requested.

203. It is important to ensure that the project's mechanism for grievance redressal is widely disseminated to the public and other affected stakeholders through (i) public consultation meetings, (ii) media advertisement, (iii) locally erected notices and other means. ADB's accountability mechanism, including information on how to file a complaint, will also be explained to affected households.

Grievance Redress Mechanism of HSEP



VII. INSTITUTIONAL ARRANGEMENTS AND RESPONSIBILITIES

A. Institutional Arrangements

204. The MOH will be the executing agency for the proposed additional financing of HSEP. PMU and provincial level PIUs established for the ongoing HSEP shall continue implementing the project. The National Project Steering and Coordination Committee chaired by the Secretary, MOH, will continue providing policy direction to the project. The Additional Secretary, State Ministry of Provincial Councils and Local Government Affairs will continue to 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, will be continue the overall coordination, management, administration, project implementation and monitoring. PIUs established at provincial level and operational under a deputy project director shall continue to assist the PMU.

205. The PMU will shall continue to function as the project office for the MOH, carry out subproject appraisal and approval, and ensure compliance with ADB loan covenants. A qualified specialist dedicated to environmental safeguards has been appointed by the PMU throughout the project implementation to:

- (i) assist the PMU/PIUs in the overall implementation of the project's EARF;
- (ii) review and endorse the safeguards screening checklist and conduct follow up assessments (IEE);
- (iii) assist the PMU in checking the provisions of civil works contracts to ensure that EMPs are integrated into the bidding documents;
- (iv) monitor compliance of the civil works contractors with EMP provisions;
- (v) prepare and submit to the ADB environmental monitoring reports for review and disclosure;
- (vi) in case unanticipated environmental impacts become apparent, advise the MOH and ADB the needed assessment to be undertaken and resources to implement mitigation measures; and
- (vii) assist the project director in all matters pertaining to environmental safeguards.

206. A safeguards officer shall be appointed to assist the environmental specialist in carrying out the tasks listed above and to conduct the screening on involuntary resettlement impacts.

207. The PMU will also be supported by a consultant specialized in HCW planning and management (which is part of the EMP requirement) who will be responsible for supporting the PMU in achieving its goals on HCWM in the primary health sector facilities selected under the project. The consultant will be reported to the project director and the environmental specialist at the PMU, who will manage the contract on a day-to-day basis.

208. The terms of reference of the HCW consultant and safeguards officer are presented in Annex 7.

B. Key Roles and Responsibilities of Various Parties Involved in Management of Safeguards

Environmental Specialist (ES) and Safeguards Officer (SO) - Project Management Unit / MOH
<ul style="list-style-type: none"> • Provide overall policy and technical direction for environmental safeguards management under the HSEP (as defined by this framework). • Ensure suitably qualified, and committed personnel are designated as environmental focal points in the local PIUs to support safeguards implementation in the provinces. • Coordinate closely with the environmental focal points in the local PIUs in planning and managing the safeguards cycle in relation to the project implementation schedule; and provide necessary technical assistance to facilitate the implementation, management, and monitoring of environmental safeguards. • Carry out a quick hazard risk assessment of all the HCFs in terms of the quantity of AC sheets that will need removal; prepare an Asbestos risk mitigation and disposal plan for each district with common disposal sites and transportation means identified and prepare a cost estimate for the disposal plan.

<ul style="list-style-type: none"> • Facilitate and monitor the preparation of the HCWM plan and play a strong coordination role between consultant, provincial and regional directors of health services , and HCFs in finalizing these plans. • Prepare the Asbestos Risk Assessment and Mitigation Plan and ensure implementation of the plan during project implementation. • Review and endorse environmental screening reports and site-specific IEEs; and obtain concurrence from the environmental safeguards specialist in the ADB team on all IEEs and the Asbestos Risk Mitigation and Disposal Plan. • Ensure that applicable measures in the EMP are included in the design, and condition on compliance with EMP is included in the bidding documents. • Develop, organize, and deliver environmental training programs and workshops for the staff of PIU, contractors, health care workers, as needed, on safeguard requirements of the project and their management. • Develop a training plan to be implemented in the provinces for implementation of the EARF. Contractor training and awareness on Asbestos handling and management is crucial to be given prior to commencement of any demolition work. • Coordinate preparation and submission of semi-annual monitoring reports for ADB. • Hold regular review meetings with the environmental focal points of the local PIUs and visit construction sites to monitor implementation of the EMP by the Contractors. • Ensure public complaints relating to nuisance and inconvenience caused by sub-project implementation are addressed with corrective action and adequately documented.
Environmental Focal Points – Provincial PIU offices
<ul style="list-style-type: none"> • Assist the ES of the PMU to conduct environmental screening for each site and in collecting necessary data for the preparation of IEE/EMPs. • Ensure compliance with EMPs during the construction period and maintain close coordination with the site engineer of the implementing agency and the contractor. • Report to the ES on-site level EMP compliance, issue, and challenges. • Prepare and submit regular environmental monitoring and implementation progress reports to the PMU as specified by the ES. • Assist ES in ensuring public complaints relating to nuisance and inconvenience caused by sub-project implementation are addressed with corrective action and adequately documented.
Other Environmental Consultants
<p>The PMU will hire other environmental consultants to provide technical support to the PMU where specialized services are required. A consultant to support HCW planning and management has been identified as a necessity to address a key environmental issue under the project. The TOR for this consultant is in Annexure 6.</p> <ul style="list-style-type: none"> (i) Key responsibilities of the HCWM specialist will include the following: <ul style="list-style-type: none"> (a) Provide training to provincial HCFs in conducting waste audits and preparing HCWM plans. (b) Supervise the audit process and set milestones for the preparation of the HCWM plan and monitor the same. (c) Technically facilitate and guide the discussion on final treatment and disposal option between the HCF, PDHS and the RDHS. (d) Report to the PMU on issues, challenges, and outcomes. (e) Provide training on the implementation of the HCWM plans.

Source: Project Management Unit, Health System Enhancement Project

C. Institutional Capacity Development

209. The environmental specialist at the PMU with support from the safeguards officer will continue in designing and delivering a training programs during the implementation of additional financing of HSEP to the staff of the PIU and selected contractors. The training will cover basic principles of screening and safeguards categorization, environmental assessment and management, monitoring methods and tools.

VIII. MONITORING AND REPORTING

210. The PMU will continue to monitor and measure the progress of EMP implementation. The monitoring activities will be corresponding with the subproject's risks and impacts and will be identified in the IEEs for the subprojects. The PMU and PIUs will continue to undertake site inspections, document review to verify compliance with the EMP and progress toward the final outcome, and record information of the work, deviation of work components from original scope.

211. The project will focus strongly on effective environmental monitoring. As the majority of the anticipated constructional stage environmental impacts from the project are general in nature and related civil works, site management, public safety, etc., monitoring will be largely carried out in the form of compliance monitoring through regular site supervision. Each subproject will have a site-specific environmental monitoring plan corresponding with project's risks and impacts. A monitoring checklist to be filled during site supervision is provided (Annex 8).

212. Monitoring of environmental parameters such as air quality, noise, vibration, and water quality will be conducted based on the requirements specified in the individual EMPs. However, given the limited scope of construction and the location of primary HCFs in largely low population density areas, no significant impact on the environmental quality of the project areas is anticipated. As such, the need for regular and systematic measuring of air, noise and water quality to monitor contribution to environmental degradation from the project per se is not considered essential.

213. The responsibility of monitoring and assessing the progress of EMP implementation will lie primarily with the PMU. It will work closely with the PDHS/RDHS and the hospital management in monitoring progress regarding HCWM planning and implementation. The PMU will be supported by the technical staff of the PIUs in monitoring activities. Actions required to improve compliance status of mitigation measures together with agreed deadlines and follow up measures shall be formally communicated with relevant parties in a timely manner during implementation, and all such records should be documented, updated, and maintained at respective project offices.

214. In the event of unanticipated environmental impacts during implementation, the IEE will have to be updated, or prepare a new IEE in consultation with ADB. For any noncompliance issue in relation to the project environmental covenants, a time-bound, budgeted, and corrective action plan should be agreed between ADB and the MOH. The corrective action plan will be reflected in the semi-annual environmental monitoring report.

215. The environmental specialist with support from the safeguards officer will prepare monthly monitoring reports documenting the progress made in EMP implementation and implementation issues with an emphasis on compliance with HCWM planning and submit them to the project director for his review (alternatively, the geographic information system based platform developed by the ADB can be used to report monitoring progress). Based on these, the PMU during the civil

works period will prepare and submit to the ADB semi-annual environmental monitoring reports within 30 days from the end of each reporting period summarizing progress and issues for each province (proposed format in Annex 9). During operational stage, the reporting will be on an annual basis. Monitoring should be done until a project completion report (PCR) is issued.

216. The PMU will document monitoring results, identify the necessary corrective actions, and reflect them in a corrective action plan. The PMU, in each quarter, will study the compliance with the action plan developed in the previous quarter. Progress monitoring should be supplemented with photo documentation of good and bad practices of sites and should be included in the progress monitoring reports.

217. ADB will review project performance against MOH's commitment as outlined in this EARF and the legal documents. It will do so by conducting periodic site visits to the project sites, conducting supervision missions with close review by ADB' safeguards specialist, reviewing monitoring reports.

ANNEXURE 1: GUIDELINE FOR MANAGEMENT OF COVID-19 INFECTIOUS WASTE

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Ministry of Health & Indigenous Medical Services

To All PDHSS, RDHSS and
All Heads of Institutions

Guideline for Management of COVID-19 infectious waste

Infectious waste generated from healthcare institutions treating COVID-19 cases shall be treated using only the following methods.

1. Incineration
2. Using a metaMizer

These two methods of treatment should be used in all healthcare institutions designated for treating COVID-19 cases.

1. Handover the infectious waste generated in Healthcare institutions in Western, Central and Southern Provinces to Sisili Hanaro Encare (Pvt) Ltd for incineration.
2. Use either incinerators or metaMizers to treat the clinical waste in all other provinces.

Please advise the staff to adhere to the following in managing infectious waste from COVID-19 cases /wards.

Infectious waste generated from suspected and confirmed COVID-19 cases should be collected in yellow polythene bags of minimum 300 gauge and tied well. It should then be put in another yellow bag (double bagged) and tied and sealed with appropriate adhesive tape. Mark the waste bag with a red label as "COVID-19 waste" for easy identification and prioritized disposal.

Sharps should be placed in cardboard sharp boxes which should be puncture proof and leak proof. Sharp boxes should be designed with a small inlet so that items can be dropped in but no item can be removed. It should be closed when ¾ full.

Make sure that the sharp box has a handle. Mark the sharp box with a red label as "COVID-19 waste" for easy identification and prioritized disposal.

COVID-19 waste containing yellow polythene bags and sharp boxes should be transported separately in a trolley or a cart which is easy to load, clean and disinfect and treated on priority basis on the same day.

The staff transporting this waste needs to wear proper personal protective equipment (PPE) such as gloves, masks, boots and overalls at all times.

The staff at the treatment facility needs to wear proper personal protective equipment such as industrial gloves, masks, boots and overalls.

Infectious waste handling staff need to be educated on how to protect them and should be provided with washing facilities with adequate soap and water.

Arrangements need to be made to treat COVID-19 infectious waste within 24 hours.

Waste management process needs to be supervised by a team nominated by the Head of the Institution

For any clarifications please contact the Director (E&OH)



Dr. Lakshman Gamlath

DDG (EOH &FS)

ANNEXURE 2: PROPOSED OUTPUTS UNDER HSEP ADDITIONAL FINANCING

(Note: The following is only tentative. This list may be updated at later stages, before finalizing the package for each HCF)

Proposed activities under Additional Financing to support Output 1

1. Shared care cluster support – Base Hospital development in 9 districts

1. Civil works are proposed at the following base hospitals.

- (c) Civil works at the 9 Base hospitals in the 9 Districts
- (d) Sewerage systems renovation/ upgrading at 8 of the Cluster Apex Hospitals

Table A2.1: Hospitals selected to implement proposed activities under Additional Financing for Shared care cluster support – Base Hospital development

Province	District	Cluster	Civil works	Sewerage works	Medical equipment and furniture
North-Central	Anuradhapura	Thambuthegama	√	√ (New)	√
	Polonnaruwa	Medirigiriya	√	√ (New)	√
Central	Nuwara Eliya	Riklagaskada	√	√ (New)	√
	Matale	Dambulla	√	√ (Under RECOVER)	√
	Kandy	Theldeniya	√	X ¹	√
Uva	Badulla	Welimada	√	√ (New)	√
	Monaragala	Bibile	√	√ (New)	√
Sabaragamuwa	Ratnapura	Kahawatte	√	√ (GoSL)	√
	Kegalle	Karawanella	√	√ (GoSL)	√

¹ Theldeniya BH has a good sewerage system that is functional. New: Indicates new sewage system; GoSL: Indicates that the sewage system shall be funded by GoSL

2. Details of these civil works are described in the following sections.

3. In addition to the civil works mentioned above, the following two activities are also proposed under additional financing.

- Medical Equipment: Medical Equipment and furniture to 9 Base Hospitals (Cluster Apex) in each of the nine district clusters: Package 1: Theatre equipment; Package 2: Physiotherapy equipment
- Operational support to make clusters functional: (a) payment of internet connectivity charges across all PDHS, RDHS, and all District health facilities, (b) payment of internet data charges for PHC staff and Cluster linked staff; (c) managing vehicle hires for establishing a health care waste management (HCWM) arrangements, transporting laboratory specimens within the clusters, for establishing travel arrangements for staff working within and across clusters, for carrying out supervision and monitoring and for provision of outreach services by cluster hospital staff, and (d) for establishing cluster-based radiology and mobile laboratory services.

Table A2.2: Civil work proposed in each Base Hospital under HSEP Additional Financing

(Note: The following is only tentative. This list may be updated at later stages, before finalizing the package for each HCF)

North Central Province**(a) Anuradhapura Pilot Cluster: Thambuthegama Base Hospital**

Objective	Description of civil works	Repair/ Renovation or New construction	Comments
Further strengthening Cluster Emergency care services (includes OPD, ETU care).	Extension to Clinic Building for provision of OPD and A & E services, rehabilitation, dental services, theatre services for eye	Expansion to the existing clinic building (Two-storied building with a foundation for six floors for future expansion)	Access to the hospital will continue to be from the side road, and the new expansion can be linked to the clinic building. The building is expected to include ETU and A&E services, Physiotherapy and other rehabilitation services, dental services and eye care services, including an eye theatre.
Strengthening surgical services for cluster population	Repairing the general theatre complex	Repairing of the existing surgery building	The surgical complex is very dilapidated and requires a substantial number of renovations. The two theatres also need extensive renovations.
Strengthening the basic facilities for surgery patients	Repairing of the surgical ward for men	Repair and expansion	The surgical ward for men requires renovation and additional space to improve the quality of care.
Establishing standard sewerage service for the hospital	Repairing the system or replacing it with a new system	Establishing environmentally friendly sewerage services	There is a very old, non-functional sewerage facility that requires many upgrades or replacement.
Improving the overall quality of care of the Cluster Apex hospital a BH Thambuthegama	Repairing and painting the whole hospital	Overall repair of the hospital, name boards, gender-sensitive and disability, elderly care supportive physical facilities and painting	The entire hospital needs extensive repairs and renovation work to be carried out to leaking roofs, broken corridor floors, painting of hospital, new name boards, etc., to get a facelift. Disability, elderly care should be adequately addressed when repair works are planned and carried out.

North Central Province

(b) Polonnaruwa Pilot Cluster: Medirigiriya Base Hospital

Objective	Description of civil works	Repair/ Renovation or New construction	Comments
Improving the services for clinic users	Expanding the building to have an upper floor	Expanding the building in front of the hospital (the upper floor of the Drug store) by constructing the upper floor to include the clinic services for patients. Access will be via the ramp already in place.	Currently, there is inadequate space for clinic users. Next to the entrance / OPD building, a drug store is available with a concrete roof and with a capacity to construct another floor. The access for this building, including access for the disabled, can be via a staircase and also via a two-story ramp already in place for the OPD/Entrance building. The upper floor will be used for clinic patients and for laboratory services.
Improving the supportive services in the cluster apex to ensure access to these services to the cluster population	Improving eye care, radiology, physiotherapy services	Expanding the building in front of the hospital (opposite end to the Drug store, near the old MOH office) by constructing the upper floor and also expanding the ground floor to include the radiology services, eye clinic and eye ward, with access to the upper floor via a ramp between the current eye theatre and the new construction.	Currently, the radiology services are provided at various places, and they require adequate space to carry out radiology services for patients. The currently functioning eye theatre needs a clinic and ward. The building that has provision for a second floor will be constructed, and the upper floor will be linked by a ramp between the eye clinic to the eye theatre as ground floor space is required for eye clinic and for some radiology services.
Improving the quality of pediatric care	Improving the pediatric care	Construction of the upper floor of the newly constructing (expected to be completed by mid-2021) PBU complex	The pediatric services are provided in an old building, while the new complex will provide PMU and supportive services. Completing the construction of the building will ensure that the Pediatric services are comprehensive.
	Improve physical connectivity in the hospital	Constructing corridors to link the newly constructing surgical complex and the PBU complex to the hospital corridors	The newly constructing surgical complex and the PBU need to be connected to the hospital corridor system.
Establishing standard sewerage service for the hospital	Construction of a sewerage system	Construction of a sewerage system is needed.	A new sewerage system has to be developed in the hospital to meet acceptable standards.
Improving the quality of services in the hospital	Repairing and painting of the hospital	Repairs	Overall, the hospital needs some repairs and renovations and repainting.

Uva Province**(a) Badulla Pilot Cluster: Welimada BH B**

Objective	Description of civil works	Repair/ Renovation or New construction	Comments
Improving OPD and clinic services in the hospital	The existing OPD building will be renovated	Repairs/renovation	The BH Welimada has an open building for OPD, but its design restricts the space available as a waiting area for patients. The building, even though not too old, requires repairs and renovations to the toilets and doors etc. The OPD building will be renovated to expand the waiting area and to provide clinical facilities on the upper floor. The physiotherapy services and Office space will be moved out of this building which will give space for these purposes. There is also a new building for ETU services (linking the current OPD area) that will be constructed using WB/PSSP funds.
Improving eye care, mental health care, laboratory services, radiology, medical care	The medical ward (currently used for COVID suspected patients) will be expanded to three floors.	Building Expansion as two upper floors to the existing building	The hospital does not have much accessible land due to hilly terrain. Therefore, a building expansion is suggested above the one storey building that is used at present as a COVID suspected patients' ward. There is a need to expand this building to two floors. The renovated ground floor (the original covid patients' ward floor) will need to be renovated as a mental health unit (currently, mental health services are provided in a very constrained area) and for eye services (eye services are not available). On the higher floor, eye theatre, radiology services, the medical ward will need to be included. There is no space to include a ramp at this site, and therefore two lifts will be required for the building. (Max square area of the newly constructed section (two upper floors) will be less than 12,000 sq. feet)

Objective	Description of civil works	Repair/ Renovation or New construction	Comments
Improving postnatal care and gynaecological care services	Pediatric ward to be built up as an upper floor for gynecologic patients and post-natal services	Building expansion with one floor upwards to Pediatric ward	The hospital Obstetrics ward is totally overcrowded, and post-natal and gynaecological patients are crowded in a limited space. The hospital needs additional space to house gynaecological patients and post-natal mothers. The Pediatric ward currently has a concrete roof and can be extended one floor up to provide these two services. The access to this will have to be via a ramp as space can be created for it, and the establishment and maintenance cost of a lift is too high.
Improving Obstetric services	Obstetric ward expansion	Building expansion linked to the Obstetric ward.	Currently, the Obstetric ward is very congested and has only four beds in the labour room. The hospital requires an expansion of the labour room to have at least eight beds. In addition, on-call rooms for the Obstetric staff is essential. Therefore, a building expansion is required to be linked to the Obstetric ward.
Renovation of the total hospital to improve quality of care	All buildings in the hospital	Building repairs, painting, and renovations, repairs to the electricity system, water supply and drainage system, repairing ward and other toilets, theatre repairs, etc.	The currently occupied Radiology services building is an old, one storey building (which will become vacant with the transfer of radiology services to the newly expanded building) will be renovated as on-call rooms for all categories of staff. In addition, the whole hospital requires painting, repairs to corridors and wards, including the quarters.
Establishing standard sewerage service for the hospital	Construction of Sewerage system	Construction of a sewerage system is needed.	There is no sewerage system for the hospital, but sewage is managed by a sewerage system operated under the Pradeshiya Sabha. But the local residents' sewerage is not well managed as this system is already overloaded. Therefore, it is recommended that the Hospital has its own sewerage system.

Uva Province**(b) Monaragala Pilot Cluster: Bibile BH B**

Objective	Description of civil works	Repair/ Renovation or New construction	Comments
Improving clinic, physiotherapy/rehabilitation and eye care services.	Improving the quality of outpatient and clinic services for patients with non-communicable diseases, eye diseases and patient requiring physiotherapy and other rehabilitation services at easy access.	Expanding the OPD building in front to expand the waiting area and the clinic, eye and physiotherapy areas	Currently, the Bibile BH has an acceptable level of facilities for OPD and ETU care (with some renovations needed in the area near the ETU and by increasing the OPD waiting area). But the clinics for (NCDs, surgery patients, etc.) are provided in a restricted area. Similarly, physiotherapy care is currently provided in a not so user-friendly area located at the far end of the hospital. The hospital does not have facilities for eye care. Therefore, the new building extension will house both the physiotherapy services and clinic services on the ground floor along with the eye services, eye theatre and eye clinic. Space for optometrist and eye ward needs to be included in the clinic expansion building. But the building will need ramps to go to the upper floor, with disability access as installing and maintaining lifts is not cost-effective and practical due to regular power failures in Bibile. Given the fund allocation limitations, the max sq area of total building extension that can be accommodated can be only 12,000 (sq feet)
Improving the quality of drugs available in the Hospital	Land next to the green-coloured kitchen building	New construction next to the kitchen area	The current drug store is an old building with limited space and also with difficult access for unloading of drugs. A well-designed drug store is essential for the hospital, and it is agreed that one storey drug stores will be constructed next to the kitchen (near the clinic extension that is proposed) with access to the hospital side entrance.
Improving the quality of services in the hospital	Repairing, renovating and painting of the hospital	Major and minor repairs across the hospital.	Overall, the hospital requires a lot of renovations to give a facelift to the hospital. This includes managing water/toilet leaks of surgical building, electrical system repairs, painting of the whole hospital, renovating the current drug stores as a mental health unit, repairing

Objective	Description of civil works	Repair/ Renovation or New construction	Comments
			the water tank and the water sump, repairing on-call rooms, repairing the corridors and the health care disposal facilities, kitchen etc.
Establishing standard sewerage service for the hospital	Construction of Sewerage system (site to be identified)	Construction of a sewerage system is needed.	There is no sewerage system, and a new system has to be developed to meet acceptable standards.
Improving the on-call facilities for staff	Doctors, nurses, minor staff on-call rooms and office space.	Building expansion and renovation.	Adjoining the surgical building, there is a small one storey building with a concrete roof for an additional floor, and it is suggested that this building should be completed with the construction of the upper floor to make space for on-call rooms for nursing staff and doctors. There is also a need to provide space for Matron's office and nursing and minor staff on-call rooms, which could also be developed by extending this building by renovating the one storey building next to it, which was originally planned for the ICU.
Supply of wall oxygen and Oxygen tank	Supply of wall oxygen for PBU & HDU and Oxygen tank	New installation	Currently, the hospital does not have wall oxygen in the PBU and the HDU, which are essential requirements.

Sabaragamuwa Province

(a) Kegalle Pilot Cluster: Karawenella BH B

Objective	Description of civil works	Repair/ Renovation or New construction	Comments
Improving facilities for Outpatient care services at the hospital	The front extension of the building will be for OPD, A&E, eye unit, and physiotherapy unit	Building expansion	The OPD services are currently provided at a location with basic facilities. All Medical Officers sit in one room without partitions affecting patient privacy. The current OPD section needs to expand to the area in front of the building (where there is currently a shed for the patient waiting area) - to the right side of the building when facing it - at two levels so that OPD patients can have access to the hospital at the lower level. The extension

Objective	Description of civil works	Repair/ Renovation or New construction	Comments
			can be built in two levels to include eye care and physiotherapy services as well. The total maximum area not to exceed 10,000 square feet for the total building.
Improving facilities for surgery services	The same current OPD building will be expanded to the back of the building to expand the surgical services with a link to the current theatres.	Building expansion	The OPD building can be expanded at the back of the building (to the left side when facing the building) to expand the surgical services. A corridor and an old surgical ward will need to be demolished for this purpose. The square area should not exceed 4,500 sq. feet. Access to the building extensions will be from the existing building.
Improving the quality of care for patients	Renovating/ refurbishing / repairing all hospital buildings so that the total hospital gets a facelift.	Repairs	The current OPD building needs to be repaired and refurbished, toilets repaired and expanded, blood bank renovated, the medical wards renovated, repairing of the drainage, repairing and renovating the water and health care waste-related systems, the records room, electricity systems in the hospital and an overall painting of the entire hospital is essential.
Establishing standard sewerage service for the hospital	Construction of Sewerage system (site to be identified)	Construction of a sewerage system is needed.	There is no sewerage system. A new system has to be developed in the hospital to meet acceptable standards.

Sabaragamuwa Province

(b) Kahawatte BH-B

Objective	Description of civil works	Repair/ Renovation or New construction	Comments
Improving the quality of services for OPD patients and for eye care services	Repair and renovate the OPD building to provide OPD services, Eye services and staff on-call and resting rooms on the upper floor.	Repairs and renovation	The OPD building needs repairs and renovations. The eye services in the OPD building needs additional space to also create the Optometrists space (the currently the fever room) opposite the eye specialist clinic in the OPD building. The current OPD entrance to be made available only for eye patients. The OPD patient entrance should be created beyond the current OPD/ Eye entrance. The OPD area to be renovated to include OPD laboratory room, sample collecting room, dressing room, injection room, Dr OPD examination rooms, toilets and a large waiting area. The building needs a wheelchair-accessible facility. The On-call staff rooms to be moved to the first floor and the first-floor clinics to be moved to the clink building, and the dental area moved to the ETU building where the current clinic pharmacy is located (which will move to the expanded clinic building).
Improving the quality of ETU care, preliminary care, ICU care, office space and auditorium	Repairing and refurbishing the ETU area	Repairs and renovation	The current ETU building is a three-storey large building with good ventilation and open spaces. On the ground floor: The ETU needs renovations to AC the area and also to expand the number of beds of the ETU and/or to also refurbish the other half of the ground floor area as a Preliminary care unit. The patient admission section may be able to move to the area opposite the current clink dispensary area (to the right of the entrance near the staircase). The current clink dispensary to be renovated as a Dental clinic with an adequate sitting area. The clinic dispensary can move to the clinic area. The rooms on the floor will also be used for infection prevention and control, quality unit etc. On the third floor, there is a large floor area which is called an Auditorium, but it is in disrepair. The third floor needs to be refurbished to accommodate both the office area and the Auditorium. The building has no access to a lift, and therefore a lift will need to be added to the building linking both the clinic building and the ETU building.
Improving the Laboratory and Blood bank services	A two-storey building expansion to the back of the ETU building (near the canteen)	Building extension to the ETU	Currently, the Laboratory services are housed inside the drug stores, and the facilities available for the drug stores and for the laboratory are compromised. The laboratories (Biochemistry, Pathology, Microbiology, and the Blood bank) will be moved to a new building extension that can be linked to the first floor of the ETU building (to the ICU floor). This extension

			building will be a maximum of 5,000 sq. feet with the potential to expand later.
Improving the quality of the drug stores	An extension to link the building to a lift and to create an unloading area.	Repairs to the Drug stores	The drug store does not have a lift, and the packages are hand-carried to the stores on the upper floor. This building urgently needs a lift and an unloading area.
Improving all clinic services and Physiotherapy services	The clinic area to be expanded to house all clinics and the clinic dispensary with an adequate seating area.	Expansion of the clinic building.	The one storey clinic building, located away from the ETU and the OPD buildings, currently houses the medical, surgical and few other clinics and the physiotherapy area. But the Clinic dispensary is in the ETU building. Therefore, the Clinic area has to be expanded to include all clinics (includes skin currently in the OPD building, ENT (later), and all other major clinics and the clinic dispensary to reduce inconveniencing the patients. The clinic floor could be expanded by about 3000 square feet with better access to toilets, improved disability access.
Improving physical connectivity via a covered hospital corridor network between wards, OPD, ETU and mortuary, kitchen etc.	Repairs and expansion of corridors, including corridor roofs.	Repairs to existing corridors and new corridors with roofs.	There are a few areas in the hospital without connectivity to the hospital corridor system, and there are corridors (linking the ETU to the wards and OPD and to the mortuary, kitchen etc.) without covered corridors.
Improving the HCWM arrangements	Construction of an area for housing the incinerator and segregated waste.	Construction of a small area for waste management.	Constructing a small area (behind the theatre complex) for storing colour coded health care waste separately, and while a new incinerator is expected, there is no space to house it. A small area needs to be constructed for this purpose.
Establishing standard sewerage service for the hospital	Construction of Sewerage system (site to be identified)	Construction of a sewerage system is needed.	There is no sewerage system. A new system has to be developed in the hospital to meet acceptable standards.
Improving the quarters facilities in the hospital	Repairs to the existing Drs, nurses and minor staff and other quarters	Repairs	The quarters need repairs to improve the quality of the quarters.

Improving the physical facilities to improve the quality of care of the hospital	The total hospital needs a painting, repairs and renovations	Repairs, renovations, and painting	The overall hospital needs painting, repair and landscaping.
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Central Province

(a) Nuwara Eliya Pilot Cluster: Rikillagaskada BH B

Objective	Description of civil works	Repair/ Renovation or New construction	Comments
Improving the outpatient care services, Clinic services, Physiotherapy services and Eye services	The OPD building facing the entrance needs to be extended to house the OPD, higher floor for clinic patients and extended to expand the Dental clinic, and the third floor to have office space.	Construction completion and refurbishment	The current OPD building needs to be renovated and extended to include the OPD dispensary, OPD lab, and new arrangement for patient flow and the ETU, triage area with necessary on-call rooms etc., on the ground floor. The waiting area for the OPD will also be expanded. On the second floor, where the Dental unit is located, the slab beyond the clinic needs to be incorporated into the dental clinic so that the dental patients have a separate waiting area. The other areas will need to be designed to have clinic rooms for all clinics and a common waiting area, and a clinic dispensary on the same floor with adequate space. On the third floor, the hospital management staff, along with a small auditorium, will be located. The current office rooms will be redesigned for Infection Prevention control room, Quality room, Cluster Office, etc.
To improve the facilities for drug store	Building extension beyond the current MS Quarters, which is used as the drug store and the current drug stores will be refurbished as the mental Health care area.	Repairs	The facilities available for the drug stores is inadequate and does not have facilities for unloading, etc. The current drug store is located in the MS quarters building, which can be refurbished for mental health services as it has direct access to the Hospital as well. A new building extending beyond the current MS Quarters (current drug stores) which is used as the drug store, needs to be constructed with access for unloading, etc. This building will require a well-designed ramp and will need to be connected to the Hospital building for transporting drugs and patients within the hospital.

Establishing facilities for Eyecare	Same building as above	New extension	The building extension to the drug stores will need to be designed to have eye care facilities (eye clinic area, area for Optometrists, area for Eye theatre etc.) preferably on the ground floor around sq ft 2000) with separate direct access to the hospital side and the drug store entrance to the face the side entrance road. There is a need to demolish an old quarters which is currently not used. The land is available beyond the current drug stores area.
Establishing Mental Health care	Renovation of current drug stores	Renovation	The current drug store (a ground floor facility) can be renovated and repaired as the Mental health unit with all required facilities.
Expanding the facilities for Physiotherapy services	Building expansion and refurbishment	Renovation and expansion	With the shifting of the indoor drug stores also to the new drug stores, the Physiotherapy area will get expanded.
Improving the quality of care of patients in medical wards	Expansion of the medical ward area	Expansion	The medical ward area needs to be expanded to include on-call rooms and better services.
Improving the Hospital Kitchen area	Renovation and refurbishment of the kitchen area rest area for staff	Renovation and expansion	The kitchen is in a very bad state of disrepair and requires renovation and better access to it with space for staff to stay. Some demolition (the corridor) is also required.
Improving the facilities at the Mortuary with Office for JMO and others with seating area	Renovation and expansion of the mortuary building at the same location.	Renovation and expansion	The current facilities available at the mortuary building is very basic, and the JMO office and police post are located elsewhere. The mortuary building needs to be upgraded to house all the required offices and facilities.
Establishing a hospital corridor system	The hospital corridor system needs to be designed and constructed at an acceptable gradient.	New construction	The hospital is located in hilly terrain and has no covered corridor system to move the patient for various services. But as it is hilly, an electric vehicle transport system may be necessary.

Improving the services for the Laboratory	A new space for the laboratory to be created on the slab above the PBU	New construction	Beyond the Pediatric ward, there is a partly constructed area that needs to be developed as the PBU, and on the floor above it, the Lab area needs to be created.
Improving the HCWM arrangements	Small area for storing HCW area. Location to be confirmed.	-	HCW storage infrastructure facilities are required.
Improving staff accommodation	Repairs and expansion of Nursing quarters and other quarters	Repairs and expansion	The existing staff quarters requires expansion and renovations.
Establishing standard sewerage service for the hospital	Construction of Sewerage system (site to be identified)	Construction of a sewerage system is needed.	There is no sewerage system. It has to be developed in the hospital to meet acceptable standards.
Improving the quality of care to patients	Overall repair and painting etc.	Repairs	The overall hospital requires many repairs, refurbishments that need to be carried out, and the full hospital needs painting etc.

Central Province

(b) Matale Pilot Cluster: Dambulla BH A

Objective	Description of civil works	Repair/ Renovation or New construction	Comments
Improving Outpatient Services, OPD lab, OPD pharmacy, all clinics including eye/ skin/ ENT/cardiology/neurology in addition to Med, surgery, Gynecology and Obstetrics and	Expansion of the current Clinic area to include adequate space for the OPD, Clinic area and MS office and staff area and auditorium	Building extension / New Building	The current Clinic area needs to be demolished along with a small building in front of the clinic which is used as the clinic sitting area to establish OPD, Clinics on the Ground floor, Laboratories on the second floor and the third floor to have Office and a small auditorium. . The max floor area that can be supported will be 15,000 sq ft.

paediatrics, the laboratory at the upper floor, and office and auditorium on the third floor.			
Improve the ETU facilities	The current ETU/OPD /Office building to be renovated as the ETU	Renovation	The current OPD/ETU /Office area can be renovated and refurbished as the ETU as there are two entrances, and the area is open and easily accessible.
Improving access to the Physiotherapy services	The current ETU/OPD /Office building to be renovated to also include an easily accessible Physiotherapy area	Renovation	The current OPD /ETU has a wide entrance, and therefore the Physiotherapy area can be considered to be provided here.
Improving Mental Health services	Renovation and expansion of Mental health unit	Expansion of building	The current area that is used for mental health is a safe and secluded area, but the area needs expansion and refurbishments and repairs to make it more user friendly and of better quality.
Improving drug storage facilities	Expansion of the current drug stores	Expansion of building	drug stores expansion of about 1,000 to 1,500 sq ft is needed. With well-designed unloading areas, a cool room and air conditioning, etc.
Improving services to Premature Baby Care unit	Construction of the partly constructed upper floor.	Expansion of building	Currently, the PBU has space only for the cots, and when a premature baby is in the PBU, the mother has to be kept far away in the postnatal ward. If the partly constructed upper floor can be completed, with access from the peds ward, PBU mother can have adequate waiting area while their babies are in the PBU.
Improving the services at the eye ward for optometry care	Extension of the access corridor to the eye ward	Renovation	Currently, the optometrists are housed in a small room with facilities for one Optometrist when 3 Optometrists are available. The corridor needs to be extended to increase the space for the Optometrists to provide the necessary services.

Improving the water storage and distribution in the Hospital		Repair / new water tank	The water tank is very old and requires urgent repairs or may need a new water tank.
Establishing standard sewerage service for the hospital	Construction of Sewerage system (site to be identified)	Construction of a sewerage system is needed.	There is no sewerage system. A new system has to be developed in the hospital to meet acceptable standards.
Improving the Hospital drainage system	The drain system requires an upgrade.	New drainage system	The hospital drainage system is in major disrepair status and requires a new system to be laid out.
Improving staff waiting rooms (on-call rooms) for the Obstetrics ward, for consultants and all other categories of staff	Obstetrics ward renovation and expansion to include an upper floor area (between the corridor and the ward) for the on-call rooms for the MOs, nurses and minor staff.	Renovation and expansion of the building	The current facilities are extremely poor, and in a very small area between the ward and the corridor, on-call rooms will need to be included with an upper floor.
	extension to staff quarters for on-call rooms for consultants as an expansion to the available quarters and repairs to all staff quarters	Renovation and expansion of the building	The current faculties are inadequate to provide on-call rooms to all the consultants, and there are staff who have to be provided with hired accommodation at a cost. There is a land area at the current staff quarters area for expanding it to include about 8-10 on-call rooms. The total expansion will need to be less than 4,000 sq. feet.
	Renovation of the current Physiotherapy building for other staff categories	Renovation	The current Physiotherapy location can be renovated for all levels of staff on-call rooms as most wards/hospital does not have adequate space as on-call rooms for minor staff, nurses, doctors and other categories of support staff.

Improve the overall quality of the hospital	All buildings need an urgent repair, wards, renovations, corridor repairs, toilet repairs, painting etc.	Renovation	The total hospital requires lots of repairs and renovations, including electrical systems, water, toilets, roofs, corridors to make the hospital have covered walkways etc.
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Central Province

(c) Kandy Pilot Cluster: Theldeniya BH A

Objective	Description of civil works	Repair/ Renovation or New construction	Comments
Improving Outpatient care and ETU services	Expansion to the current OPD area	Renovation and expansion of the building	The OPD/ ETU / Medical ward, eye theatre complex is needed that is linked to the current entrance area with a direct link to the surgical and other wards from there. This was discussed, and agreement needs to be reached if the suggested location can link to the other ward areas etc.
Improving staff quarters	Renovation and repairs of the building	Renovation and repairs of the building	The Nurses quarters are dilapidated and the PHM quarters are also in disrepair, and only minor staff are currently living in them. Both those buildings may need to be demolished, and new quarters are needed for Nurses, Minor staff and PHMs etc. The area shall not be more than 5,000 sq feet. Better access can be provided to the quarters from the side entrance.
Improving the kitchen facilities	Renovation and repairs of the building	Renovation and repairs of the building	The kitchen is in a dilapidated state and needs urgent repairs.
Improving the medical wards areas for mental health services	Renovation and repairs of the building	Renovation and repairs of the building	medical wards are very dilapidated, and they can be moved to the new ETU/OPD complex (upper floor), and the current medical ward area can be renovated as the clinic area for all disciplines.
Improving the overall quality of care	Renovation and repairs of the building	Renovation and repairs of the building	The entire hospital requires repairs, renovations and painting

Proposed activities under HSEP Additional Financing to support Output 2

The following are proposed under HSEP additional financing:

- Health information technology for better continuity of care and disease surveillance:
- COVID-19 response (reallocated funds)
- COVID-19 Management Support (equipment and minor civil works)

The details of these provisions are listed in Table 3.29 given below:

Table A2.3: List of equipment and minor civil works proposed for HEP Additional Financing

A. Medical Equipment for COVID care
ICU equipment (level 3) and some Level 2 equipment Multipara Monitor Advanced; Video Laryngoscope; BIPAP Machine; Ventilator Transport; Dialysis; Blood Fluid Warmers; Ventilator ICU; CRRT; Defibrillator; USS Portable; X-ray portable; Mini Autoclave; Blood gas Analyzer; RO Plant Portable; ECG; Nebulizer; Glucometers; Suction Apparatus; High Flow Nasal Oxygen Therapy; Oxygen Cylinders (Jumbo); Oxygen Cylinders (Medium); Oxygen Cylinders (Small); Oxygen Concentrators; Wall Oxygen Port; Oxygen Regulators; Connectors
Medical furniture ICU Beds; Adjustable Bed; Emergency Trolley; Spot lamp; HDU Beds
For maternal wards and non-Covid centres Ventilator Neonatal; CTG; Infant Incubator; Infant Warmers; Phototherapy Machine Double; Handheld Doppler Machine
B. Oxygen Tanks/generators
Oxygen concentrating plants (generators) (1 for each district)
Civil works to house the concentrator plants
Oxygen Liquid Tanks (3,000 to 20,000L)
C. Lab equipment to establish Mobile Laboratory for each RDHS (to be used in clusters, other PMCUs, to support BHs at each district)
Allocation to purchase equipment for each Laboratory
Purchase vans for each mobile laboratory
D. Consumables for PCR testing
PCR Test kits; Viral transport Medium; PCR extraction kits; Other consumables (pipette tips with filters, powderless gloves, Eppendorf tubes, PCR tubes etc.)
E. HDU Development and support to treatment centres
Civil works to establish HDU units in Secondary level hospitals

Wall oxygen system (averaging 15 ports per system)
F. Transport services for COVID Home care support (Ambulance for use by MOHs, to Suweseriya later)
Transport support via hired vehicles to MOH offices, RDHS, MOH
Purchase of Ambulances and equipment for Basic life support and renovation of ambulance stations
G. Lab Equipment for SLIBTEC
BSL II (AI) Safety Cabinets, Next Generation sequencing machine, Flow – cytometer; Freeze dryer, Advanced microplate reader for live cell based assays including chemiluminescence assays, Automated nucleic acid extraction system, PCR machine - real time, PCR Machine – Conventional, Micro pipettes - single channel (10 µL); Micro pipettes - single channel (200 µL); Micro pipettes - single channel (1000 µL); Micro pipettes - single channel (20 µL); Micro pipettes - adjustable volume 8 channel (1000 µL), Micro pipettes - adjustable volume 8 channel (300 µL), Micro pipettes - adjustable volume 8 channel (10 µL), Micro pipettes - adjustable volume 8 channel (30 µL), Micro pipettes - adjustable volume 12 channel (1000 µL), Micro pipettes - adjustable volume 12 channel (300 µL), Micro pipettes - adjustable volume 12 channel (10 µL), Micro pipettes - adjustable volume 12 channel (30 µL), Pipette racks, PCR hood, Gel documentation system; Gel tank (large) and power unit - Horizontal, Gel tank (large) and power unit – Vertical, Fluorimeter for nucleic acid quantification, Fluorescent microscope- Inverted, Inverted microscope with phase contrast attachment; Light microscopes normal, Bench top high speed refrigerated ultracentrifuge, Microfuge, Microfuge Refrigerated, Vortex mixers, Shaker, Dry bath, Magnetic Stirrers (with hot plate), Digital precision laboratory balance, pH meter, Water bath with accessories; Hybridization oven, CO2 Incubators with built in contamination control/ automated sterilization system, Incubator (37°C), Heated/ refrigerated Temp controlled circulating Water bath with accessories; Cordless motorized adjustable volume pipette fillers, ELISA plate incubator, ELISA plate washer, Sonicator, Hemocytometer, Ice flake maker, Strip cutter, Bottle top adjustable volume liquid dispenser 2.5 - 25 ml, Pharmaceutical refrigerators upright, Liquid N2 containers (100ml), CO2 tanks (30L), CO2 pressure regulator, Laboratory hotplate, Electric Bunsen burners, Tank carrier cart with wheels, Manual adjustable pipette fillers
Cold storage: Freezers (-20°C), Freezers (-80°C), Liquid N2 tank, including the hose, Liquid N2 dewars for cell storage (35L)
Sterilization and media preparation: Milli-Q® integral water purification/ deionization system, Distilled water plant, large scale autoclave (200L), Small scale autoclave (50L), Hot air oven, Glassware storage cabinets; Pipette fillers
De-contamination: Large scale autoclave (200L), Small scale glassware washer; Small scale autoclave (50L); Glassware drying oven, Glassware storage cabinets
Lab safety wear: Cyro aprons, Laboratory coat, Safety eye shields/ goggles, Face shield clearways; Cyro boots; Safety gloves for freezers

Assistance from JFPR

Under the JFPR grant it is propose to strengthen the existing health care vehicle fleet by introducing new Ambulances covering all 25 administrative districts of the country. Further the Ambulance stations of Suwaseriya service shall be renovated. A total of 20 out of 48 such

locations shall be selected and all these stations are located within Police Stations of the selected area.

Proposed activities under HSEP Additional Financing to support Output 3

Further to the above, the following activities are also proposed under HSEP additional financing.

- (i) Distance Learning Center (DLC) and National Institute of Health Sciences (NIHS) development
- (ii) Costs to accommodate project extension (includes PMU additional costs)
- (iii) Contingency allocations

Upgrade LAN Network system at National Institute of Health Sciences (NIHS)
Upgrade Audio Visual System Auditorium, Lecture Hall 1, 2, 3
Renovation of Boy's Hostel No .02
Renovation of ADB Hostel
Renovation of Auditorium
Renovation works at Female Hostel
Renovation of In-Service Hostel
Renovation of Boy's Hostel No. 01
External colour washing and other minor repair work at the administration building
External colour washing and other minor repair work at Seminar Hall No. 02
Renovation of PHLT Laboratory
Renovation of Library
Medical Centre phase II
Improvements to Canteen at NIHS

(Note: The above lists are only tentative. These lists may be updated at later stages, before finalizing the package for each HCF)

ANNEXURE 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) fibre is encapsulated in a cement matrix. While this fibre-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) ageing and fungal attacks on AC sheets or (ii) the process of ageing 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, the 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.



Asbestos roofing sheets & ceiling sheets to be removed during demolition at Kahawatta BH



Asbestos roofing sheets & ceiling sheets to be removed during demolition at Welmada BH



Asbestos roofing sheets & ceiling sheets at Medirigiriya BH



Asbestos roofing sheets at Karawanaella BH

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.

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 polyethene 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 as 'asbestos waste'.
- Put the asbestos waste bag in a clear polythene bag and tape it closed.
- For disposal of the discarded AC sheets;
 - Store the sealed asbestos sheets in a safe corner of the hospital premises or transport them to a central disposal yard where waste from all sites in the district can be stored.
 - Transfer to the sanitary landfill at Aruwakkalu, which will be ready for operation in 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

ANNEXURE 4: ADB PROHIBITED INVESTMENT ACTIVITIES LIST

The following do not qualify for Asian Development Bank financing:

- (i) production or activities involving harmful or exploitative forms of forced labor^a or child labor;^b
- (ii) production of or trade in any product or activity deemed illegal under host country laws or regulations or international conventions and agreements or subject to international phaseouts or bans, such as (a) pharmaceuticals,^c pesticides, and herbicides,^d (b) ozone-depleting substances,^e (c) polychlorinated biphenyls^f and other hazardous chemicals,^g (d) wildlife or wildlife products regulated under the Convention on International Trade in Endangered Species of Wild Fauna and Flora,^h and (e) transboundary trade in waste or waste products;ⁱ
- (iii) production of or trade in weapons and munitions, including paramilitary materials;
- (iv) production of or trade in alcoholic beverages, excluding beer and wine;^j
- (v) production of or trade in tobacco;^j
- (vi) gambling, casinos, and equivalent enterprises;^j
- (vii) production of or trade in radioactive materials,^k including nuclear reactors and components thereof;
- (viii) production of, trade in, or use of unbonded asbestos fibers;^l
- (ix) commercial logging operations or the purchase of logging equipment for use in primary tropical moist forests or old-growth forests; and
- (x) marine and coastal fishing practices, such as large-scale pelagic drift net fishing and fine mesh net fishing, harmful to vulnerable and protected species in large numbers and damaging to marine biodiversity and habitats.

^a Forced labor means all work or services not voluntarily performed, that is, extracted from individuals under threat of force or penalty.

^b Child labor means the employment of children whose age is below the host country's statutory minimum age of employment or employment of children in contravention of International Labor Organization Convention No. 138 "Minimum Age Convention" (www.ilo.org).

^c A list of pharmaceutical products subject to phaseouts or bans is available at <http://www.who.int>.

^d A list of pesticides and herbicides subject to phaseouts or bans is available at <http://www.pic.int>.

^e A list of the chemical compounds that react with and deplete stratospheric ozone resulting in the widely publicized ozone holes is listed in the Montreal Protocol, together with target reduction and phaseout dates. Information is available at <http://www.unep.org/ozone/montreal.shtml>.

^f A group of highly toxic chemicals, polychlorinated biphenyls are likely to be found in oil-filled electrical transformers, capacitors, and switchgear dating from 1950 to 1985.

^g A list of hazardous chemicals is available at <http://www.pic.int>.

^h A list is available at <http://www.cites.org>.

ⁱ As defined by the Basel Convention; see <http://www.basel.int>.

^j This does not apply to project sponsors who are not substantially involved in these activities. Not substantially involved means that the activity concerned is ancillary to a project sponsor's primary operations.

^k This does not apply to the purchase of medical equipment, quality control (measurement) equipment, and any equipment for which ADB considers the radioactive source to be trivial and adequately shielded.

^l This does not apply to the purchase and use of bonded asbestos cement sheeting where the asbestos content is less than 20%.

ANNEXURE 5: ENVIRONMENTAL, IR SCREENING CHECKLISTS AND GUIDELINE TO PRESENT AN ENVIRONMENTAL AUDIT REPORT

Annex 5.1. Environmental Screening Checklist

Instructions:

A. The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Environment and Safeguards Division (SDES) for endorsement by Director, SDES and for approval by the Chief Compliance Officer.

(ii) Answer the questions assuming the “without mitigation” case. The purpose is to identify potential impacts. Use the “remarks” section to discuss any anticipated mitigation measures.

Basic Information on the Health Care Facility (HCF)

Name of the HCF	
Location	Province District Divisional Secretariat Division
Type of HCF	
Number of beds and bed occupancy rate	
No of out-patients a day	
No of staff	
Proposed rehabilitation interventions	
Contact person in the HCF	

PART 1

A. General construction related impacts

Screening Questions	Yes	No	Remarks
B. Project Siting Is the project site within or adjacent to any of the following areas:			
▪ Densely populated area			
▪ Cultural heritage site			
▪ Protected Area			
▪ Wetland and water bodies			
▪ Mangrove			
▪ Estuarine			
▪ Buffer zone of protected area			
▪ Special area for protecting biodiversity			
C. Potential Environmental Impacts Will the Project involve or cause...			
▪ Encroachment on historical/cultural areas?			

Screening Questions	Yes	No	Remarks
▪ Encroachment on precious ecology (e.g. sensitive or protected areas)?			
▪ Unsatisfactory raw water supply			
▪ Conflicts in abstraction of water with other beneficial water uses of the same sources			
▪ Over pumping of groundwater			
▪ Increase in production of general solid waste			
▪ Increase in production of hazardous waste			
▪ Increased sewage flow			
▪ Generation of sludge from waste treatment plants			
▪ Use of or dismantling of structures that contain Asbestos			
▪ Noise and dust from construction activity?			
▪ Soil erosion and silt run off from construction activity?			
▪ Accident risks associated with increased vehicular traffic?			
▪ Increased noise and air pollution resulting from increased traffic volume?			
▪ Risks and vulnerabilities related to occupational health and safety due to physical hazards during project construction and operation?			
▪ Requirements for disposal of fill, excavation, and/or spoil materials?			
▪ Loss of large trees (more than 30 cm DBH); how many?			
▪ Long-term impacts on groundwater flows as result of needing to drain the project site prior to construction?			
▪ Long-term impacts on local hydrology as a result of building hard surfaces in or near the building?			
▪ Large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?			
▪ Risks to community safety caused by fire, electric shock, or failure of the buildings safety features during operation?			
▪ Risks to community health and safety caused by management and disposal of waste?			
▪ Procurement of x-ray machines or any other equipment containing radioactive material			
▪ Procurement of incinerators?			
▪ Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather-related events such as floods, droughts, storms, landslides?			

Part II

Health Care Waste Assessment

Generation

Source	Waste type ⁹					
OPD	General	Sharps	Infectious	Chemical	Pathological	Pharmaceutical
Medical Ward						
Surgical Ward						
Theatre						
ETU						
Laboratory						
Pharmacy/Drug Store						
Labor room						
Other						
Kg/Day						

Waste Segregation

Questions	Yes	No	Description
Is clinical waste segregated from general waste? If yes, into which categories are HCW separated?			No segregation
			General waste
			General Infectious waste
			sharps
			Pathological waste
			other
Where does the segregation take place?			
What type of bags/primary containers are used in segregating wastes?			
What type of labelling/color coding is used in segregation			
What types of equipment are used for internal transport of wastes?			
Where is the segregated waste stored until final disposal?			
Describe the final disposal method	Sharps		
	Infectious waste		
	Pathological waste		
	General waste		
	Other		

Waste handling and treatment

⁹⁹Sharps: items that could cause cuts or puncture wounds, including needles, hypodermic needles, scalpel and other blades, knives, infusion sets, saws, broken glass, and nails; Pathological waste: consisting of tissues, organs, body parts, human fetuses and animal carcasses, blood, and body fluids; Infectious waste: suspected to contain pathogens (bacteria, viruses, parasites, or fungi) in sufficient concentration or quantity to cause disease in susceptible hosts. Chemical waste: consists of discarded solid, liquid, and gaseous chemicals, used for diagnostic and experimental work and for cleaning, housekeeping, and disinfecting procedures; Pharmaceutical waste: expired, unused, spilt, and contaminated pharmaceutical products, drugs, vaccines, and sera that are no longer required and need to be disposed of; Radioactive waste: waste that contains radioactive material.

Equipment	Y e s	N o	Description/Capa city/Number of units	Location (within hospital or nearest facility with approximate distances)	Status (used/functioning or not)
Incinerator					
Metamizer					
Autoclave					
Lined burial pits					
Unlined burial pits					
Waste cards					
Color-coded waste bins					
Waste storage space					

Waste Handling

Questions	Yes	No	Remarks
Is there a designated person (s) responsible for organization and management of waste collection, handling, storage, and disposal at the hospital administration level?			
Does the waste management staff have job descriptions detailing their tasks?			
Has he/she received any training on hospital waste management?			
Are there clearly defined procedures for collection and handling of wastes from specified units in the hospital?			
Does your hospital have a written Waste Management Plan?			
Are waste handlers provided with adequate personal protective equipment (PPE)			

Water supply and sewerage

Questions	Yes	No	Remarks
Does the hospital have a sewer treatment plant? If not, is it disposed to on-site soakage pt.?			
If a sewer treatment is available, when was it built?			
Does the HCF have a water supply provided by drinking water scheme?			
Is the water treated?			
Is the water supply adequate?			
Does the HCF have Reverse Osmosis units for treating raw water supply?			

Screening decision and recommendation

Project Safeguard Category	A	B	C
	IEE needed		
	EIA needed		
	Any other		

Recommendations for improving health care waste management (in line with the district strategy envisioned by the RHDS)	
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Details of the person conducting screening

Screening checklist completed by	Date
<i>Name/Designation/Contact information</i>	<i>Signature</i>
Screening report reviewed and approved by	Date
<i>Name/Designation/Contact information</i>	<i>Signature</i>

Annex 5.2 Involuntary Resettlement Screening Checklist

A. Basic information on the health care facility (HCF)

Name of the HCF	
Location	Province District Divisional secretary division
Type of HCF	
Number of beds and bed occupancy rate	
No. of out-patients per day	
No. of staff	
Proposed rehabilitation interventions	
Contact person in the HCF	

B. Involuntary resettlement impacts

Probable Involuntary Resettlement Effects	Yes	No	Not Known	Remarks
Involuntary Acquisition of Land				
1. Will there be land acquisition?				
2. Is the site for land acquisition known?				
3. Is the ownership status and current usage of land to be acquired known?				

4. Will easement be utilized within an existing Right of Way (ROW)?				
5. Will there be loss of shelter and residential land due to land acquisition?				
6. Will there be loss of agricultural and other productive assets due to land acquisition?				
7. Will there be losses of crops, trees, and fixed assets due to land acquisition?				
8. Will there be loss of businesses or enterprises due to land acquisition?				
9. Will there be loss of income sources and means of livelihoods due to land acquisition?				
Involuntary restrictions on land use or on access to legally designated parks and protected areas				
10. Will people lose access to natural resources, communal facilities and services?				
11. If land use is changed, will it have an adverse impact on social and economic activities?				
12. Will access to land and resources owned communally or by the state be restricted?				
Information on Displaced Persons:				
Any estimate of the likely number of persons that will be displaced by the subproject? <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> NA				
If yes, approximately how many? _____				
Are any of them poor, female-heads of households, or vulnerable to poverty risks? <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> NA				
Are any displaced persons from indigenous or ethnic minority groups? <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> NA				

Annex 5.3 A Sample Guideline to Present an Environmental Audit Report

1. Introduction

- 1.1 Project Background
- 1.2 Objective of The Audit

2. Standards & Methodology

- 2.1 Applicable Environmental Standards
- 2.2 E&S Permitting Requirements
- 2.3 Methodology
 - 2.3.1 Approach
 - 2.3.2 Risk Categorization

3. Site Assessment

- 3.1 Basic Information
- 3.2 Site Description
- 3.3 EHS Assessment
 - 3.3.1 EHS Management Overview
 - 3.3.2 EHS Permits
 - 3.3.3 EHS Monitoring and Performance

4. Corrective Action Plan

Annex A: List of Documents Reviewed

Annex B: Stakeholders Engaged During the Audit

Annex C: Photo Log

ANNEXURE 6: INFORMATION TO BE INCLUDED IN ENVIRONMENTAL MANAGEMENT PLANS

A. Identification of impacts and description of mitigation measures

Firstly, Impacts arising out of the project activities need to be clearly identified. Secondly, feasible and cost-effective measures to minimize impacts to acceptable levels should be specified with reference to each impact identified. Further, it should provide details on the conditions under which the mitigatory measure should be implemented (e.g., routine or in the event of contingencies). The EMP also should distinguish between the type of solution proposed (structural & non-structural) and the phase in which it should become operable (design, construction and/or operational).

B. Enhancement plans

Positive impacts or opportunities arising out of the project need to be identified during the EA process. Some of these opportunities can be further developed to draw environmental and social benefits to the local area. The EMP should identify such opportunities and develop a plan to systematically harness any such benefit.

C. Monitoring program

To ensure that the proposed mitigatory measures have the intended results and comply with national standards and donor requirements, and environmental performance monitoring program should be included in the EMP. The monitoring program should give details of the following;

- Meaningful Monitoring indicators to be established and periodically measured for evaluating the performance of each mitigatory measure (for example, national standards, engineering structures, the extent of area replanted, etc.).
- Monitoring mechanisms and methodologies
- Monitoring frequency
- Monitoring locations

D. Institutional arrangements

Institutions/parties responsible for implementing mitigatory measures and for monitoring their performance should be clearly identified. Where necessary, mechanisms for institutional coordination should be identified as often monitoring tends to involve more than one institution.

E. Implementing schedules

Timing, frequency and duration of mitigation measures with links to the overall implementation schedule of the project should be specified.

F. Reporting procedures

Feedback mechanisms to inform the relevant parties on the progress and effectiveness of the mitigatory measures and monitoring itself should be specified. Guidelines on the type of information wanted, and the presentation of feedback information should also be highlighted.

G. Cost estimates and sources of funds

Implementation of mitigatory measures mentioned in the EMP will involve an initial investment cost as well as recurrent costs. The EMP should include costs estimates for each measure and identify sources of funding.

H. Contract clauses

This is an important section of the EMP that would ensure recommendations carried in the EMP will be translated into action on the ground. Contract documents will need to be incorporated with clauses directly linked to the implementation of mitigatory measures. Mechanisms such as linking the payment schedules to implementation of the said clauses could be explored and implemented, as appropriate.

Consultation with affected people and NGOs in preparing the MP will be an integral part of all Category A projects and is recommended for Category B projects.

ANNEXURE 7: TERMS OF REFERENCE FOR HCW MANAGEMENT SPECIALIST/ SAFEGUARDS OFFICER

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 the 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 the 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 the 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 their progress on an annual basis.

TOR for the Safeguards Officer

1. Assist the ES of the PMU to conduct environmental and IR screening for each site and in collecting necessary data for the preparation of IEE/EMPs.
2. Assist the ES to ensure compliance with EMPs during the construction period and maintain close coordination with the site engineer of the implementing agency and the contractor.
3. Report to the ES on-site level EMP compliance, issue and challenges.
4. Assist the PIUs to prepare and submit regular environmental monitoring and implementation progress reports to the PMU as specified by the ES.

5. Assist ES in ensuring public complaints relating to nuisance and inconvenience caused by sub-project implementation are addressed with corrective action and adequately documented.
6. Assist the Social Specialist of PMU in implementing social safeguard related matters.
7. Assist ES and SS of PMU in developing and implementing training and awareness workshops on safeguards.

ANNEXURE 8: ENVIRONMENTAL FIELD MONITORING DATA SHEET**Health Sector Enhancement Project
Project Management Unit**

Date of visit:

Name of HCF:

Location:

EMP COMPLIANCE							
	Mitigation measures from the EMP	Progress Level (Activity Implementation Status)		Level of Execution (Environmental Rank)		Remarks - During this Field Visit	
		%	Color	Rank	Color	Photo Taken*	Observations
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

Colour code	Level of execution
	Good
	Moderate
	Poor

ANNEXURE 9: OUTLINE FOR A SEMI-ANNUAL ENVIRONMENTAL MONITORING REPORT

1. Introduction
 - a. Overall project description and objectives
 - b. Details of site personnel and/or consultants for environmental monitoring
 - c. Description of subprojects and status of implementation
 - d. Approach and methodology for environmental monitoring of the project
2. Compliance status with national/state/local statutory environmental requirements
3. Compliance status with environmental loan covenants
4. Compliance status with the environmental management plan
5. Implementation of grievance redress mechanism and public complaints
6. Overall compliance with CEMP/EMP and EMoP
7. Monitoring of environmental impacts on project surroundings
8. Conclusions and recommendations