Updated Initial Environmental Examination

June 2020

CAM: Greater Mekong Subregion Health Security Project

Prepared by the Ministry of Health, Cambodia for the Asian Development Bank. This is an updated version of the draft originally posted in October 2016 available on https://www.adb.org/projects/documents/gms-health-security-project-cam-oct-2016-iee

CURRENCY EQUIVALENTS

(as of 9th August 2019)

Currency unit	–	riel/s (KR)
KR1.00	=	$0.000244
$1.00	=	KR4,085

ABBREVIATIONS

ADB	–	Asian Development Bank
AIDS	–	Acquired Immune Deficiency Syndrome
APSED	–	Asia Pacific Strategy for Emerging Diseases
BOD	–	Biological oxygen demand
CDC	–	Communicable Diseases Control
CEP	–	Commitment on Environmental Protection
COD	–	Chemical oxygen demand
CPMU	–	Central Project Management Unit
EA	–	Environmental assessment / Executing Agency
EARF	–	Environmental Assessment and Review Framework
EIA	–	Environmental Impact Assessment
EIAR	–	Environmental Impact Assessment Report
EID	–	Emerging Infectious Diseases
EMP	–	Environmental Management Plan
GOL	–	Government of Lao People's Democratic Republic
GMS	–	Greater Mekong Subregion
HIV	–	Human Immunodeficiency Virus
GMS-HSP	–	Greater Mekong Sub-region-Health Security Project
IEE	–	Initial Environmental Examination
IHR	–	International Health Regulations
IP	–	Indigenous peoples
IPC	–	Infection Prevention and Control
Lao PDR	–	Lao People's Democratic Republic
MEVs	–	Migrants and mobile populations, ethnic minorities, and other vulnerable groups
MOE	–	Ministry of Environment
MOH	–	Ministry of Health
PCU	–	Project Coordination Unit
PHD	–	Provincial Health Department
PIA	–	Provincial Implementing Agency
PPMU	–	Provincial Project Management Unit
REA	–	Rapid Environmental Assessment
SWM	–	Solid Waste Management
WHO	–	World Health Organization

NOTE

In this report, "$" refers to US dollars.

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I. INTRODUCTION

A. Background of the Project

1. The Greater Mekong Subregion (GMS) comprises Cambodia, China (Yunnan and Guangxi), Laos, Myanmar, Thailand, and Viet Nam, with a population of about 326 million people. The region has gone through rapid economic development, with overall GDP growth of about 7% per year during the past decade. The major demographic, economic and technological differences among the GMS countries, combined with improved connectivity and trade facilitation, bring about substantial business dynamics. Regional investments have increased rapidly, stimulated by regional security, low cost labor, and improved connectivity. Better roads, ports and trade agreements facilitate participation in the global market. Regional tourism has also increased dramatically. GMS Countries are industrializing rapidly, resulting in a rapid increase in migrant workers, mostly internally, but also externally. Urbanization is increasing rapidly, and creating new challenges that require major investments. This has also increased the risk of the spread of communicable diseases associated with increased connectivity, employment, and social and physical living environment.

2. Under the GMS economic development program, the Governments of Cambodia, Lao People's Democratic Republic (Lao PDR), Viet Nam and Myanmar, and the Asian Development Bank (ADB) aim to achieve core capacities for the control of emerging infectious diseases (EIDs) and other major public health threats based on international standards of the World Health Organization (WHO). A GMS Health Security Project (the Project) of $132.2 million has been proposed for 2016, with a total of $117 million in loan, $8.0 million in grants from ADB's Special Funds resources, and government counterpart funds of $7.2 million. The Project follows other health projects for communicable diseases control (CDC), Human Immunodeficiency Virus (HIV), Malaria, and related regional technical assistance[1].

B. Purpose and Structure of the Report

3. The project is categorized as a Category B project in accordance with the ADB's 2009 Safeguards Policy Statement. The Initial Environmental Examination (IEE) presented in this report is to assess the environmental impacts of the project and propose measures to mitigate negative impacts. The IEE has been prepared following the procedures described in the Environmental Assessment Review Framework (EARF) established for the project.

4. The following methodology has been implemented in the preparation of the IEE:

(i) Review of project-related documents and literature relevant to the project areas initially surveyed/assessment.
(ii) Site visits to view the environmental conditions in all target project areas and the general location of the projects, totally 27 provincial and district referral hospitals.
(iii) Consultation with hospital management and staff to source information on project area characteristics and potential project impacts.
Identification of existing environmental and socio-economic characteristics to develop project baseline data.
(iv) Analysis of typical environmental impacts of project components and identification of suitable typical mitigation measures to ameliorate potential impacts.
(v) Development of institutional arrangements for implementation of environmental

[1] Including Community Action for HIV Prevention in 2001; GMS Regional Communicable Diseases Control Project in 2004; Second GMS Communicable Diseases Control Project in 2010; GMS Capacity Building for HIV/AIDS Prevention Project in 2012; Japan Fund for Poverty Reduction projects such as for Model Healthy Village; and technical assistance for malaria and dengue control, health education, e-Health, and related areas

management and monitoring.

(vi) Development of a set of environmental criteria for future project activity selection.

(vii) Development of environmental assessment and review procedures (EARPs) for future project sub-components.

II. POLICY AND LEGAL FRAMEWORK

5. This chapter discusses the policy and legal framework as well as the institutional set-up relevant to the environmental and social assessment of the project.

A. ADB Policy

1. Safeguard Policy Statement

6. This report has been prepared in accordance with the ADB's Safeguard Policy Statement, 2009 (SPS) which governs the environmental and social safeguards of ADB' operations. Environmental Safeguard Requirements 1 of the SPS outlines the requirements the borrowers/clients are required to meet when delivering environmental safeguards for projects supported by ADB. These requirements include assessing impacts, planning and managing impact mitigations, preparing environmental assessment reports, disclosing information and undertaking consultation, establishing grievance redress mechanism (GRM), and monitoring and reporting. [Safeguard Requirements1 (SR1): environment of SPS 2009] also includes specific environmental safeguard requirements pertaining to biodiversity conservation and sustainable management of natural resources, pollution prevention and abatement occupational health and safety, and conservation of physical cultural resources.

2. Screening and categorization

7. At an early stage of the project, ADB screens and categorizes proposed projects based on the significance of potential project impacts and risks. Screening and categorization is undertaken to (i) reflect the significance of potential impacts or risks that a project might present; (ii) identify the level of assessment and institutional resources required for the safeguard measures; and (iv) determine disclosure requirements. A project's category is determined by the category of its most environmentally sensitive component, including direct, indirect, cumulative, and induced impacts in the project's area of influence. The nature of the environmental assessment required for a project depends on the significance of its environmental impacts, which are related to the type and location of the project; the sensitivity, scale, nature, and magnitude of its potential impacts; and the availability of cost-effective mitigation measures. Projects are screened for their expected environmental impacts, and are assigned to one of the following four categories:

(i) **Category A.** Projects could have significant adverse environmental impacts. An EIA is required to address significant impacts.

(ii) **Category B.** Projects could have some adverse environmental impacts, but of lesser degree or significance than those in category A. An IEE is required to determine whether significant environmental impacts warranting an Environmental Impact Assessment (EIA) are likely. If an EIA is not needed, the IEE is regarded as the final environmental assessment report.

(iii) **Category C.** Projects are unlikely to have adverse environmental impacts. No EIA or IEE is required, although environmental implications are reviewed.

(iv) **Category FI.** Projects involve a credit line through a financial intermediary or an equity investment in a financial intermediary. The financial intermediary must apply an environmental management system, unless all projects will result in insignificant impacts.

8. The Rapid Environmental Assessment (REA) checklist for the preparation of IEE was completed on 14 June 2019. The main purpose of the site assessment is the following:

(i) assessment of the existing location and the surrounding environment of 27 Hospitals building locations and identify if there are sensitive areas, archaeological sites and historical sites located in or near the project area/sub-project areas;
(ii) identify potential environmental and socioeconomic impacts on the proposed small building construction size (7mX7m);
(iii) consultations with director's/deputy directors and IPC involved staff of 27 Hospitals about the project/subprojects;

B. Cambodia Environmental Laws and Guidelines

9. Implementation of the project will be governed by the environmental acts, rules, policies and regulations of the Royal Government of Cambodia. These regulations impose restrictions and guidelines on the activities to minimize and/or mitigate likely impacts to the environment. The project will involve construction activities and civil works on existing location.

1. Environmental Laws

10. The Law on Environmental Protection and Natural Resources Management (No:NS/RKM/1296/36) was enacted in 1996 and is the main law for protection of the environment in Cambodia. Article 6 of the law requires that environmental impact assessment (EIA) be undertaken for proposed projects with the Ministry of Environment designated as the authority to review EIAs prior to submission to the Government for approval.

11. The Sub-Decree on Environmental Impact Assessment and Process (Sub-Decree 72, 11 August 1999) supports the Law of Environmental Protection and Natural Resources and sets out institutional responsibilities, impact assessment requirements and the procedures for undertaking the environmental assessment process. The annex to the sub-decree lists all projects (public or private) for which environmental assessment is required. The project which involves the construction of small building and minor repairs of laboratory facilities in the existing building is not required to undertake an EIA because only buildings that have a height greater than or equal to 12m or floor area greater than or equal to 8,000m^2 requires an EIA.

12. Other environmental laws and regulations applicable during the construction activities in the small buildings are the following:

(i) Sub-Decree ANK/BK No. 42 (July 2000) - The Control of Air Pollution and Noise Disturbance. The general provisions in this sub-decree states its purpose to protect the quality of the environment quality and public health from air pollutants and noise disturbance through monitoring, curbing and mitigating activities. It applies to all movable sources and immovable sources of air pollution and noise disturbance. Immovable source refers to sources with a permanent location such as a factory, enterprise, warehouse**,** construction site, incinerator, loud speakers, handicraft, and all kinds of farms.

(ii) Sub-Decree ANK/BK No. 36 (April 1999) - Solid Waste Management: The general provisions of this sub decree set is to regulate the solid waste management with proper technical manner and safe way in order to ensure the protection of human health and the conservation of bio-diversity applicable to all activities related to disposal, storage, collection, transport, recycling, dumping of garbage and hazardous waste.

(iii) Sub-Decree ANK/BK No. 27 (April 1999) - Water Pollution Control: This sub decree applies to all sources of pollution and all activities that cause pollution of the public water areas. Effluent standard for pollution sources discharging wastewater to public water areas or sewer are regulated. Source of pollution refers to any type of places such as dwelling house, public administrative building, premise, transport facilities, business areas or service places from which effluent, pollutants or hazardous substances are directly or indirectly discharged into public water areas or public drainage systems.

2. Laws on Nature Reserves

13. Royal Decree "Protected Natural Areas" issued in November 1993 gives protection to environment, land, forests, wetlands and coastal zones. The decree covers twenty-three (23) locations representing 18% of Cambodia's total area and is under the jurisdiction of the Ministry of Environment.

3. Laws on Wildlife

14. The "Joint Prakas of the Ministry of Environment and Ministry of Agriculture on Prohibition of Hunting and Catching Wildlife Animals, 1996" specifically bans hunting of animals and birds for food. All contractor's workers must observe this law.

4. Protected Area Law

15. In 2008, Cambodia introduced the Protected Area Law (No. NS/RKM/0208/07), which explicitly defines protected areas as (i) national parks; (ii) wildlife sanctuaries; (iii) protected landscapes; (iv) multiple use areas; (v) Ramsar sites; (vi) biosphere reserves; (viii) natural heritage sites; and (ix) marine parks.

5. Applicable Guidelines from Ministry of Health (MOH)

16. The MOH has the following guidelines to be implemented during the construction phase of the Project and especially for Infection Prevention and Control (IPC) implementation:

(i) The National guideline for Infection Prevention and Control for Healthcare Facilities 2017: The objective of IPC program: to reduce the incidence and risk of preventable Nosocomial Infection (NI), and to formulate an organizational framework that guides the effective use of resources to deliver safe, cost-effective and evidence-based healthcare.
(ii). Biosafety Guideline for Laboratory.

The Sub-Decree ANK/BK No. 42 (July 2000) of Ministry of Environment - The Control of Air Pollution and Noise Disturbance. It applies to all movable sources and immovable sources of air pollution and noise disturbance. Immovable source refers to sources with a permanent location such as a factory, enterprise, warehouse**,** construction site, incinerator, loud speakers, handicraft, and all kinds of farms. The Noise and vibration measures as dB(A) but did not mention as figure mainly for hospitals ward room indoor and or treatment room indoor. The table 1, guideline values for community noise in specific environments has mentioned about hospital ward rooms indoors Sleep disturbance, night-time and sleep disturbance, daytime and evenings are 30 dB(A). Table 1 delineated the guideline values for community noise in specific environments:

Table 1: Guideline values for community noise in specific environments

Specific Environment	**Critical Health Effect (s)**	**L_{Acq} [dB(A)]**	**Time base [hour]**	**L_{Amax} fast [dB]**
Outdoor living area	Serious annoyance, day time and evening Moderate annoyance, day time and evening	55 50	16 16	- -

Dwelling, Indoors Inside bedrooms	Speech intelligibility and moderate annoyance, daytime and evening, Sleep disturbance, night-time	35 30	16 8	 45
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45	8	60
School classrooms & pre-schools, indoors	Speech intelligibility, disturbance of information extraction, message communication	35	During class	-
Pre-school bedrooms, indoor	Sleep disturbance	30	Sleeping-time	45
School, playground outdoors	Annoyance (external source)	55	During play	-
Hospital, ward rooms, indoors	**Sleep disturbance, night-time** **Sleep disturbance, daytime and evenings**	**30** **30**	**8** **16**	**40** **-**
Hospital, treatment rooms, indoors	**Interference with rest and recovery**	**#1**		

III. DESCRIPTION OF THE PROJECT

A. Project Rationale

3. The Government of Cambodia aims to achieve core capacities for the control of EIDs and other major public health threats based on international standards of the WHO especially at the border areas. Cambodia, aiming to comply with WHO standards to achieve GMS health security, has requested ADB project support to address critical gaps in core capacities. Ministry of Health (MOH) and WHO have conducted evaluation of Asia Pacific Strategy for Emerging Diseases (APSED) implementation in 2014. Cambodia has not yet achieved International Health Regulations (IHR) and APSED targets. Core functions owned by MOH are well in place, but other functions depending more on collaboration with other countries, sectors, partners, community, and the private sector are less advanced. The recent Middle East Respiratory Syndrome and Ebola outbreaks, and the Zika virus scare have put re-emerging infection diseases back in the limelight. While progress in other regional priorities is mixed, there is major progress in the control of malaria and dengue, and less progress in the control of HIV/AIDS and tuberculosis and the major emerging concerns of nosocomial infections and multiple drug resistance.

B. Project Design

4. The impact will be GMS public health security strengthened. The outcome will be GMS health system performance, with regard to health security, improved. The proposed project locations are the provinces along the borders and economic corridors. In these locations, health facilities typically serve not only the local population but also mobile and migrant populations in the region. Selection of project provinces is based on (i) economic status of the province; (ii) health and health services statistics; (iii) regional risks and priority clusters; and (iv) existing support from other partners.

5. In Cambodia, the proposed project amount is $22.8 million of which the Government of Cambodia requested a loan of $21.0 million from the ADB Special Funds. The Government counterpart contribution in $1.8 million (9%) in taxes, allowances and in-kind contributions. The Department of Planning and Health Information Systems represents MOH as the Executing Agency.

6. In summary, the Government of Cambodia will use the loan to finance hardware (laboratory and infection prevention and control equipment, computers, transport vehicles and

other auxiliary devices, and use government resources to finance software (training and workshops) and project management.

C. Regional cooperation and CDC in border areas

7. Regional cooperation is mainly in the form of information exchange and joint outbreak responses. While national level information exchange is affected by lack of leadership, cross-border cooperation is gaining momentum.

8. Sub-groups of migrants and mobile populations, ethnic minorities, and other vulnerable groups (MEVs) in border areas have unique risk of exposure to particular diseases. The risks may vary by occupation and location. However, there are particular concerns for cross-border migrant workers returning home with HIV or Tuberculosis, who may not have access to care on their return. HIV-infected youths and pregnant mothers also may have limited access to services and care. The project will explore new strategies for reaching MEVs and for timely reporting of patients with certain symptoms from remote communities using syndromic surveillance.

D. Surveillance and Response

9. Several disease reporting systems are in place which are not linked, do not reach communities, and do not provide necessary diagnostics and quality public health information to make meaningful decisions in a timely manner. Computerization of data management would allow linkages with clinical services and e-learning. Competent field epidemiologists at provincial level and assistants at district level are few, thereby also limiting the efforts to improve disease control and community prevention and preparedness. In addition, through workshops and other knowledge management activities, specific strategies for disease control and system strengthening will be developed. Workshops will be comprised of carefully prepared participatory learning and strategic planning events with monitoring of follow up actions by the regional coordination unit. Through bilateral agreements with the neighboring border countries, the Project will explore strategies to reach various MEVs who are more likely to be exposed to different types of diseases.

E. Laboratory services and Hospital Infection Prevention and Control

10. In Cambodia, much of the efforts in improving laboratory services have gone into strategic planning, provision of equipment and setting up laboratory services in the larger regional hubs often using mentoring, quality control at central level, and, more recently, also multiple initiatives to improve biosafety. However, as laboratory services are complex requiring some 20 subsystems to be in place, the support for the subsystems have received much less attention such as support for: undergraduate education; laboratory management, facilities, registration and inspection/audit; medical-laboratory linkages; and transport and maintenance systems. It is necessary to address these gaps that will ensure better use of past investments in staff and equipment.

11. Hospital and health centers are the most likely points of contact for newly emerging diseases, and also pose a major concern in terms of spreading these diseases. In addition, health facilities are a source of hospital acquired infection or nosocomial infections and drug resistance. Current equipment and practices in health facilities for infection prevention and control, and waste disposal are sub-standard and unsafe, and would not meet IHR or APSED obligations. Realizing this, Cambodia is currently launching a new Infection Prevention and Control (IPC) plan and, based on the WHO guidelines, is rolling out a comprehensive IPC program that requires strong MOH commitment and more investments in IPC scholarships, infection control management, and hospital equipment and hygiene supplies.

F. Project Location

12. The Project in Cambodia covers 13 border provinces along its border with Lao PDR, Vietnam, and Thailand. The proposed provinces include: at the northeast border with Lao PDR and Viet Nam: Preah Vihear, Stung Treng, Ratanakiri, Mondulkiri and Kratie; at the northwest border with Thailand: Battambang, Pailin, Banteay Meanchey; and at the southeast border with Viet Nam: Kandal, Kampot, Prey Veng, Svay Rieng and Tboung Khmum. These are poor border districts hospitals in provinces in terms of shortage of equipment for infection prevention and control (IPC) and Laboratory bio-safety. The northeastern provinces are indigenous peoples populated area. The main focus will be on the border provinces and districts. The map bellow denoted the target project:

G. Project Outputs

Output 1: Strengthening regional, cross-border, and inter-sectoral CDC

13. MOH has made progress with regional information sharing and inter-sectoral and cross-border cooperation for CDC. In border areas, MEVs are more likely to get and spread infectious diseases and are less using formal health services. Under this component, it is proposed that the Project supports (i) regional, cross-border, and inter-sectoral information sharing and coordination of outbreak control among GMS countries, (ii) regional capacity for evidence-based CDC, (iii) development of better disease control strategies for MEVs in border areas, and (iv) increased CDC for MEVs in hotspots along economic corridors in targeted border areas. Support is needed for information exchange, simulation exercises, joint outbreak control, strategic planning for MEV disease control strategies in border areas, outreach to MEVs, and improving access of MEVs to CDC.

Output 2: Strengthening national disease surveillance and outbreak response

14. MOH has a functioning surveillance system for notifiable diseases in place, and surveillance of HIV, malaria and tuberculosis is strong. However, the system needs to be

further computerized, extended to reach all health centers and communities by employing syndromic reporting, and data management has to be improved. Linkages or integration among surveillance systems with Health Management Information System/District Health Information System will also be considered. MOH also needs to improve capacity for risk analysis, community preparedness, and disease outbreak response. Under this component, it is proposed that the Project supports: (i) syndromic reporting at community level; (ii) web-based reporting including information technology support; (iii) linking of disease surveillance systems, including linking clinical and laboratory surveillance; (iv) improving capacity for risk analysis, risk communication, and community preparedness; (v) improving capacity of outbreak response teams including transport; and (vi) improving screening and quarantine capacity at border points of entry and quarantine centers. Support is needed for system design, training information technology equipment, vehicles, training, and equipment for screening and outbreak control.

Output 3: Improving laboratory services and hospital infection prevention and control

15. District facilities are unable to comply with internationally acceptable levels of biosafety or to guarantee the accuracy of their laboratory testing. Underlying problems are substandard training of laboratory staff, lack of quality control, and insufficient facilities, equipment, and supplies. The quality assurance systems are in a nascent stage, and there are no national laboratory audit systems. Nosocomial or hospital-acquired infections are becoming a major public health threat. Under this component, it is proposed that the Project supports improving biosafety and quality of laboratory services and expanding services for CDC. Inputs will be (i) staff training for provincial and district hospitals for internal quality improvement, (ii) preparing standard operating procedures, (iii) providing basic equipment, supplies and minor repairs for laboratory facilities, (iv) setting up external quality assurance and audit system for compliance with national biosafety and quality guidelines, and (v) setting up a laboratory network. For infection control in hospitals, the Project will support roll out of IPC through training in hospital hygiene and special case management, provision of basic equipment and minor repairs of wards.

H. Project Outputs of Environmental Concern

16. The requirement for an environmental impact assessment is linked to the following Project output 3, namely: provide laboratory equipment and training for equipment for infection prevention and control, including laundry services and waste disposal.

17. The above component will require screening of potential environmental impacts and a discussion of mitigating or enhancement measures as a result of the impacts because the activities involve public health risks and potential accidents, minor repair and improvement works, the installation and commissioning of laboratory equipment and related devices, and the operation of the target provincial/district hospitals' existing medical waste management and waste water treatment facilities – all of which impact the project's environmental setting and require environmental safeguards.

18. The screening addresses the potential impacts of the relevant project activities under the loan project, which are re-defined for purposes of the IEE, namely: (i) minor repair and improvement works; (ii) laboratory equipment commissioning including infection prevention and control (IPC) services; (iii) operation of the existing solid waste management facilities and (iv) operations of the existing wastewater treatment facilities described as follows:

- **Project Activity 1 – Minor repair and improvement works.** This activity includes the minor repair and improvement works of the hospital facilities specifically affected by the provision of access, accommodation, modification and installation of new or upgraded laboratory equipment and auxiliary devices, IPC

equipment and devices including laundry equipment, computer systems, etc.

- **Project Activity 2 – Laboratory equipment commissioning including IPC services.** This activity includes the mobilization, equipment installation, commissioning, demobilization, recurrent maintenance checks by the suppliers/contractors, and the operation from installation and during the life of the equipment. The equipment means the totality of the laboratory equipment, auxiliary equipment, laundry and washing/drying equipment, and relevant IPC devices and supplies, laundry equipment including the transport vehicles for the transport of laboratory specimen procured under the Project.

- **Project Activity 3 - Solid Waste Management facilities.** The collective activity indicates existing activities that include: (1) the storage and segregation (as applicable) of medical infectious/hazardous and non-infectious/non-hazardous wastes; (2) collection and transfer for disposal or recycling (as applicable); (3) internal and external transportation of medical waste; recycling or composting of non-hazardous wastes; and (4) disposal at: (i) an approved and dedicated disposal facility such as a provincial hospital. The proposed microwave-based waste management will transform the medical waste from hospitals into a compact, dry, inert material, with a weight reduction of 25% and a volume reduction of 80% and it can be disposed as normal solid waste to public dumping site of municipalities.

19. The Project will finance the procurement of laboratory equipment and supplies, transport vehicles, laundry and other infection prevention and control equipment, computer systems and devices for the newly-improved hospitals and other institutions identified by provincial authorities serving as the target populations. A total of 13 target provinces will comprise the beneficiaries of the project. Equipment purchases will be in accordance with established MOH standards and will replace old and non-functioning equipment, upgrade technology for existing procedures, or provide new services. The Project will also support the purchase of an initial inventory of reagents and other supplies needed to properly utilize the new equipment. Procurement and supply of equipment will be closely coordinated with the other components of the project implementation.

20. Once completed, the newly improved and renovated laboratory facilities and supplies, IPC equipment and related devices, computers and related systems, and transport vehicles that are part of the Project need to be properly maintained to realize benefits and justify investments. The Project will ensure that hospital personnel are properly trained to use the equipment and operating manuals are supplied in the Cambodian language. The Government of Cambodia shall support the preparation of guidelines for preventive maintenance and training of hospital personnel in preventive maintenance procedures.

21. The Government of Cambodia has also assured that the supplies needed to operate the equipment, as well as the costs of maintenance will be provided during and beyond the project period through recurrent costs and adequate increases in operation and maintenance budgets.

22. Moreover, this project does include civil works and medical waste management and waste water treatment equipment, the investments will be made with the assurance from the Government of Cambodia that all facilities included in this Project have adequate safe water, sanitation, and medical waste management systems, including waste water systems, proper containers to segregate contaminated and hazardous waste, proper collection and storage facilities, and access to modern medical waste incineration and/or non-burn treatment and disposal facilities in compliance with the country's environmental laws and the safeguards policy of the ADB. It is incumbent upon the Government of Cambodia that hospital personnel in all facilities covered by the project will be trained in the theory, methodologies, and supervision of modern medical waste and waste water management practices. In addition, the Project will

support consulting assistance to work with authorities in each target province to develop a province-wide plan for the management of medical waste.

I. Project Category

23. For purposes of this IEE, the hospitals surveyed will be indicative and representative of the extent of environmental impact assessment and review that shall have to be performed for the other remaining provinces and districts in accordance with ADB guidelines as the project progresses.

24. This IEE has been prepared based on a field survey/assessment of 27 provincial and district referral hospitals of the target project by interviewing with hospitals management and IPC focal points/staff dealing with environmental impact assessment, the regulation of hazardous substances, pollution control and solid waste management. WHO (2015) data were also obtained regarding the status of health care waste management in Cambodia. The findings on the practices in hospital safety and sanitation, infection prevention and control (IPC), and risk of accidents and spills during storage, transfer, transport and containment of bio-hazards, and the rapid environmental assessment confirmed the project to be Categorized as B for environmental safeguards. Each of the participating provinces will prepare site- specific Environmental Management Plan (SEMPs) covering all project activities during implementation and in accordance with the environmental laws of the Government of Cambodia.

25. The following table indicates the environmental categorization screening of 27 hospitals showing current activities as a result of field visits:

Table-2: Summary results of preliminary screening of 27 Hospitals Greater Mekong Sub-Region Health Security Project (GMS-HSP)

The safeguards assessment is based on updated ADB screening checklists to identify the potential impact of current operations without assuming the mitigation measure:

No.	Name of Hospital	Location/ address	Environment category	
			Category	Key notes
1.	Kaoh Thom RH	Prek Thmei village and commune, Kaoh Thom district, Kandal province	C	None
2	Angkor Chey RH	Pou village, Phnum Kong commune, Angkor chey district , Kampot province	C	None
3	Kampong. Trach Referral Hospital (RH)	Kampong Trach Ti Mouy village, Kampong Trach khang lech, Kampong trach district, Kampot province	B	Improper waste management and waste water discharge
4	Kampot Provincial Referral Hospital (PRH):	Kampong Bay Khan Tboung village, Sangkat Kampong Bay, Kampot City, Kampot Province-	B	LAB liquid waste discharges to municipal sewerage system, close to Prek Kandal estuary, and may be connecting to the sea water?.
5	Chhuk RH:	Krasang Village, Chhuk commune, Chhuk District, Kampot Province	B	Improper waste management and waste water discharge. Flooding during rainy season may needs to elevate 1 meter in height.
6	RH Pea Reang	Snay Pul village, Roka commune, Pea Reang district, Prey Veng province	B	Smog from incinerator to hospital, smell, Improper waste management and waste water discharge. Settling pond, incinerators and placenta pit are closed to water sources for hospital. The waste water from settling pond may be spilling over to outsiders during rainy season/heavy rain.
7	Prey Veng PRH	Phum Bei village, Sangkat Kampong Leav, Prey Veng municipality and province	C	None
8	Preah Sdach Referral Hospital (RH)	Krasang Tung village, Angkor Reach commune, Preah Sdach district, Prey Veng province	C	None
9	Kampong Trabaek RH	Cham Bak village, Prasat commune, Kampong Trabaek district, Prey Veng province	C	issues of di sludge of individual cesspits

Table-2: Summary results of preliminary screening of 27 Hospitals Greater Mekong Sub-Region Health Security Project (GMS-HSP)

The safeguards assessment is based on updated ADB screening checklists to identify the potential impact of current operations without assuming the mitigation measure:

No.	Name of Hospital	Location/ address	Environment category	
			Category	Key notes
10	Svay Rieng PRH	Srah Vong village, Sangkat Svay Rieng, Svay Rieng municipality and province	C	None
11	Chi Phu RH	Chrey Thom village, Sangkat Prey Angkonh, Bavet municipality, Svay Rieng province	B	Improper waste management and waste water discharge
12	Ponhea Krek RH:	Pou Srok village, Koang Kang commune, Ponhea Krek district, Tboung Khmum province	C	- Settling pond is shallow, the waste water intended to spill over outside the hospital campus. The hospital has her own dumping site, outside the hospital campus for general solid waste disposal.
13	RH Memot:	Tboung Wat village, Memot commune and district, Tboung Khmum province	C	None
14	NSHN Tboung Khmum	Soung Leach village, Sangkat Soung, Soung municipality and Tboung Khmum province	C	Sharp waste and medical waste sending to incinerate at Ponhea Krek hospital
15	Kratie PRH	Kracheh village, Sangkat Kracheh and Kracheh municipality, Kratie province	C	None
16	Snoul RH:	Kbal Snoul village, Snoul commune and district, Kratie province	B	landmines and UXOs within the hospital premise. Improper waste management and waste water discharge. Dusty, dirty and muddy.
17	Mondulkiri PRH:	Cham Bak village, Sangkat Spean Mean Chey, Senmonorom municipality, Mondulkiri province	B	Densely, populated area, smog from incinerator, sludge from toilets and smelling within campus.
18	Ratanakiri PRH	Boeng Kanseng village, Sangkat Boeng Kanseng, Krong Banlung, Ratanakiri province	C	None

Table-2: Summary results of preliminary screening of 27 Hospitals Greater Mekong Sub-Region Health Security Project (GMS-HSP)

The safeguards assessment is based on updated ADB screening checklists to identify the potential impact of current operations without assuming the mitigation measure:

No.	Name of Hospital	Location/ address	Environment category	
			Category	Key notes
19	Stung Treng PRH	Prek village, Sangkat Stung Treng, Stung Treng municipality, Stung Treng province	B	Mekong river water flooding every 5 to 10 years, need to elevate to the level of safety (for integrated microwave waste management, issue of sludge and effluents within the hospital premise
20	16 Makara PRH	Andoung Pou village, Sangkat Kampong Pranak, Preah Vihear municipality and province	C	None
21	Battambang PRH	Prek Moha Tep village, Sangkat Svay Pao, Battambang municipality and province	C	None
22	Pailin PRH:	Phum Wat village, Sangkat Pailin, Krong Pailin and Pailin province	C	None
23	Sampao Lun RH	Tasda village and commune, Sampao Lun district, Battambang province	B	Improper waste management and waste water discharge. Cesspit close to water sources/ground water
24	Poipet RH	Prochea Thorm village, Sangkat Phsa Kandal, Poipet municipality, Banteay Meanchey province	C	Settling pond intended to spill-over outsider during rainy season, when heavy raining.
25	Thma Pouk RH	Kak Sen village, Thma Pouk commune and district, Banteay Meanchey province	B	Rain water flooding/water puddle, water supply is not leaned/muddy, Improper waste management and waste water discharge.
26	CJFH PRH BMC	Koh Keo village, Ruessey Kroak commune, Mongkul Borey district, Banteay Meanchey province	C	None
27	Moung Russey RH	Moung village and commune, Moung district, Battambang province	B	Improper waste management and waste water discharge, densely populated area

Source: Field assessment May-June 2019

J. Subproject Descriptions, Proposed Scope of Works and Environmental Baseline

26. Safeguards specialist together with infection prevention and control (IPC) consultant conducted field visits to 27 hospitals in relation to IPC/environment and social safeguard issues, to assess and screening. Table below delineated the survey results:

Table-3: Locations, Land Area and Buildings of 27 Hospitals					
No.	**Hospital Name**	**Address/location**	**Land Area, m²**	**Number of Buildings**	**Proposed Civil Works**
1	Kaoh Thom district referral hospital (RH)	Prek Thmei village and commune, Kaoh Thom district, Kandal province	45,288	9	-Laboratory facility is proposing to have a minor repair and a proposed construction of small building for installation of microwave-based waste management
2	Angkor Chey RH	Pou village, Phnum Kong commune, Angkor chey district , Kampot province	10,864	7	-Laboratory facility is proposing to have a minor repair and a proposed construction of small building for installation of microwave-based waste management
3	Kampong. Trach RH	Kampong Trach Ti Mouy village, Kampong Trach khang Lech, Kampong trach district, Kampot province	9,840	7	--Laboratory facility is proposing to have a minor repair and a proposed construction of small building for installation of microwave-based waste management
4	Kampot Provincial referral hospital (PRH):	Kampong Bay Khan Tboung village, Sangkat Kampong Bay, Kampot City, Kampot Province-	45,383	14	-Refurbish Lab and Microwave-based waste management
5	Chhuk RH:	Krasang Village, Chhuk commune, Chhuk District, Kampot Province	9,098	6	-Laboratory facility is proposing to have a minor repair and a proposed construction of small building for installation of microwave-based waste management
6	RH Pea Reang RH	Snay Pul village, Roka commune, Pea Reang district, Prey Veng province	13,454	9	-Laboratory facility is proposing to have a minor repair and a proposed construction of small building for installation of microwave-based waste management
7	Prey Veng PRH	Phum Bei village, Sangkat Kampong Leav, Prey Veng municipality and province	17,195	13	-Laboratory facility is proposing to have a minor repair and a proposed construction of small building for installation of microwave-based waste management

Table-3: Locations, Land Area and Buildings of 27 Hospitals					
No.	**Hospital Name**	**Address/location**	**Land Area, m²**	**Number of Buildings**	**Proposed Civil Works**
8	Preah Sdach RH	Krasang Tung village, Angkor Reach commune, Preah Sdach district, Prey Veng province	15,330	12	-Refurbish Lab and Microwave-based waste management
9	Kampong Trabaek RH	Cham Bak village, Prasat commune, Kampong Trabaek district, Prey Veng province	32,000	7	-Laboratory facility is proposing to have a minor repair and a proposed construction of small building for installation of microwave-based waste management
10	Svay Rieng PRH	Srah Vong village, Sangkat Svay Rieng, Svay Rieng municipality and province	12,760	9	-Refurbish Lab and Microwave-based waste management
11	Chi Phu RH	Chrey Thom village, Sangkat Prey Angkonh, Bavet municipality, Svay Rieng province	5,456	5	-Laboratory facility is proposing to have a minor repair and a proposed construction of small building for installation of microwave-based waste management
12	Ponhea Krek RH:	Pou Srok village, Koang Kang commune, Ponhea Krek district, Tboung Khmum province	26,482	13	-Laboratory facility is proposing to have a minor repair and a proposed construction of small building for installation of microwave-based waste management
13	Memot RH	Tboung Wat village, Memot commune and district, Tboung Khmum province	23,236	16	-Laboratory facility is proposing to have a minor repair and a proposed construction of small building for installation of microwave-based waste management
14	NSHN Tboung Khmum PRH	Soung Leach village, Sangkat Soung, Soung municipality and Tboung Khmum province	45,126	9	-Laboratory facility is proposing to have a minor repair and a proposed construction of small building for installation of microwave-based waste management

Table-3: Locations, Land Area and Buildings of 27 Hospitals					
No.	**Hospital Name**	**Address/location**	**Land Area, m²**	**Number of Buildings**	**Proposed Civil Works**
15	Kratie PRH	Kracheh village, Sangkat Kracheh and Kracheh municipality, Kratie province	19,259	20	-Laboratory facility is proposing to have a minor repair and a proposed construction of small building for installation of microwave-based waste management
16	Snoul RH:	Kbal Snoul village, Snoul commune and district, Kratie province	25,399	6	-Laboratory facility is proposing to have a minor repair and a proposed construction of small building for installation of microwave-based waste management
17	Mondulkiri PRH:	Cham Bak village, Sangkat Spean Mean Chey, Senmonorom municipality, Mondulkiri province	17,462	14	-Laboratory facility is proposing to have a minor repair and a proposed construction of small building for installation of microwave-based waste management
18	Ratanakiri PRH	Boeng Kanseng village, Sangkat Boeng Kanseng, Krong Banlung, Ratanakiri province	46,304	11	-Laboratory facility is proposing to have a minor repair and a proposed construction of small building for installation of microwave-based waste management
19	Stung Treng PRH	Prek village, Sangkat Stung Treng, Stung Treng municipality, Stung Treng province	14,232	14	-Refurbish Lab and Microwave-based waste management
20	16 Makara PRH	Andoung Pou village, Sangkat Kampong Pranak, Preah Vihear municipality and province	57,748	9	-Refurbish Lab and Microwave-based waste management
21	Battambang PRH	Prek Moha Tep village, Sangkat Svay Pao, Battambang municipality and province	54,695	19	-Refurbish Lab and Microwave-based waste management
22	Pailin PRH:	Phum Wat village, Sangkat Pailin, Krong Pailin and Pailin province	14,770	6	-Refurbish Lab and Microwave-based waste management

Table-3: Locations, Land Area and Buildings of 27 Hospitals					
No.	**Hospital Name**	**Address/location**	**Land Area, m²**	**Number of Buildings**	**Proposed Civil Works**
23	Sampao Lun RH	Tasda village and commune, Sampao Lun district, Battambang province	26,815	12	-Laboratory facility is proposing to have a minor repair and a proposed construction of small building for installation of microwave-based waste management
24	Poipet RH	Prochea Thorm village, Sangkat Phsa Kandal, Poipet municipality, Banteay Meanchey province	19,960	7	-Laboratory facility is proposing to have a minor repair and a proposed construction of small building for installation of microwave-based waste management
25	Thma Pouk RH	Kak Sen village, Thma Pouk commune and district, Banteay Meanchey province	21,941	9	-Laboratory facility is proposing to have a minor repair and a proposed construction of small building for installation of microwave-based waste management
26	CJFH PRH-BMC	Koh Keo village, Ruessey Kroak commune, Mongkul Borey district, Banteay Meanchey province	53,989	16	-Laboratory facility is proposing to have a minor repair and a proposed construction of small building for installation of microwave-based waste management
27	Moung Ruessey RH	Moung village and commune, Moung district, Battambang province	11,611	13	-Laboratory facility is proposing to have a minor repair and a proposed construction of small building for installation of microwave-based waste management

Source: field assessment and Detailed Engineering Designs (DED) May-June 2019

The following sections are describing of each subproject locations, proposed civil works implementations:

27. Kaoh Thom district referral hospital is located in Prek Thmei village and commune, Kaoh Thom district, Kandal province. This hospital is on state-owned land, and belongs to the Kandal Provincial Department of Health. The civil works under the project/program will include minor repair of the existing laboratory facility within the existing building and the construction of small shelter (7mx7m) for microwave-based waste management (integrated biomedical waste treatment and disposal) within the designated area. Medical waste (sharp/hazardous) is segregated from general waste. The medical waste is incinerated within the hospital campus while the general waste is stored on site then and transported off-site for disposal. Liquid waste from the laboratory is discharged into individual cesspits within the hospital campus. There is no settling pond in the hospital. Each toilet has its own cesspit.

28. Angkor Chey district referral hospital is located in Pou village, Phnum Kong commune,

Angkor Chey district, Kampot province. This hospital is on state-owned land, has fencing enclosure, belonging to the Kampot Provincial Department of Health. The civil works under the project/program will include minor repair of the existing laboratory facility within the existing building and the construction of small shelter (7mx7m) for microwave-based waste management (integrated biomedical waste treatment and disposal) within the designated area. Medical waste (sharp/hazardous) is segregated from general waste. The medical waste is incinerated within the hospital campus while the general waste is stored on site then and transported off-site for disposal. Liquid waste from the laboratory is discharged into individual cesspits within the hospital campus. The settling pond of hospital is unavailable. Each toilet has its own cesspit. The liquid waste from laboratory is discharged into individual cesspits within the hospitals' campus. There is hug collected septic tank within hospital campus. Each toilet has it own cesspit.

29. Kampong Trach district referral hospital is located in Kampong Trach Ti Mouy village, Kampong Trach Khang Lech commune, Kampong trach district, Kampot province. This hospital is on state-owned land, and belongs to the Kampot Provincial Department of Health. The civil works under the project/program will include minor repair of the existing laboratory facility within the existing building and the construction of small shelter (7mx7m) for microwave-based waste management (integrated biomedical waste treatment and disposal) within the designated area. Medical waste (sharp/hazardous) is segregated from general waste. The medical waste is incinerated within the hospital campus while the general waste is stored on site then and transported off-site for disposal. The liquid waste from laboratory is discharged into individual cesspits within the hospitals' campus. The settling pond of hospital is unavailable. Each toilet has its own cesspit.

30. Kampot provincial referral hospital is located in Kampong Bay Khang Tboung village, Sangkat Kampong Bay, Kampot municipality, Kampot Province. This hospital is on state-owned land, and belongs to the Kampot Provincial Department of Health. The civil works under the project/program will include refurbishment of the existing laboratory facility within the existing building and the construction of small shelter (7mx7m) for microwave-based waste management (integrated biomedical waste treatment and disposal) within the designated area. Medical waste (sharp/hazardous) is segregated from general waste. The medical waste is incinerated within the hospital campus while the general waste is stored on site then and transported off-site for disposal. The liquid waste from laboratory is discharged into individual cesspits within the hospitals' campus. The settling pond of hospital is unavailable. Each toilet has its own cesspit.

31. Chhuk district referral hospital is located in Krasang village, Chhuk commune, Chhuk district, Kampot province. This hospital is on state-owned land, and belongs to the Kampot Provincial Department of Health. The civil works under the project/program will include minor repair of the existing laboratory facility within the existing building and the construction of small shelter (7mx7m) for microwave-based waste management (integrated biomedical waste treatment and disposal) within the designated area. Medical waste (sharp/hazardous) is segregated from general waste. The medical waste is incinerated within the hospital campus while the general waste is stored on site then and transported off-site for disposal. The liquid waste from laboratory is discharged into individual cesspits within the hospitals' campus. The settling pond of hospital is unavailable. Each toilet has its own cesspit.

32. Pea Reang district referral hospital is located in Snay Pul village, Roka commune, Pea Reang district, Prey Veng province. This hospital is on state-owned land, and belongs to the Prey Veng Provincial Department of Health. The civil works under the project/program will include minor repair of the existing laboratory facility within the existing building and the construction of small shelter (7mx7m) for microwave-based waste management (integrated biomedical waste treatment and disposal) within the designated area. Medical waste (sharp/hazardous) is segregated from general waste. The medical waste is incinerated within the hospital campus while the general waste is stored on site then and transported off-site for disposal. The liquid waste from laboratory is discharged into individual cesspits within the hospitals' campus. There are settling pond is existed within the hospital campus. Each toilet has its own cesspit.

33. Prey Veng provincial referral hospital is located in Phum Bei village, Sangkat Kampong Leav, Prey Veng municipality and province. This hospital is on state-owned land, and belongs to the Prey Veng Provincial Department of Health. The civil works under the project/program will include minor repair of the existing laboratory facility within the existing building and the

construction of small shelter (7mx7m) for microwave-based waste management (integrated biomedical waste treatment and disposal) within the designated area. Medical waste (sharp/hazardous) is segregated from general waste. The medical waste is incinerated within the hospital campus while the general waste is stored on site then and transported off-site for disposal. The liquid waste from laboratory is discharged into individual cesspits within the hospitals' campus. The settling pond of hospital is unavailable. Each toilet has it own cesspit.

34. Preah Sdach district referral hospital is located in Krasang Tung village, Angkor Reach commune, Preah Sdach district, Prey Veng province. This hospital is on state-owned land, and belongs to the Prey Veng Provincial Department of Health. The civil works under the project/program will include refurbishment of the existing laboratory facility within the existing building and the construction of small shelter (7mx7m) for microwave-based waste management (integrated biomedical waste treatment and disposal) within the designated area. Medical waste (sharp/hazardous) is segregated from general waste. The medical waste is incinerated within the hospital campus while the general waste is stored on site then and transported off-site for disposal. The liquid waste from laboratory is discharged into individual cesspits within the hospitals' campus. There are settling pond is existed within the hospital campus. Each toilet has its own cesspit.

35. Kampong Trabaek district referral hospital is located in Cham Bak village, Prasat commune, Kampong Trabaek district, Prey Veng province. This hospital is on state-owned land, and belongs to the Prey Veng Provincial Department of Health. The civil works under the project/program will include minor repair of the existing laboratory facility within the existing building and the construction of small shelter (7mx7m) for microwave-based waste management (integrated biomedical waste treatment and disposal) within the designated area. Medical waste (sharp/hazardous) is segregated from general waste. The medical waste is incinerated within the hospital campus while the general waste is stored on site then and transported off-site for disposal. The liquid waste from laboratory is discharged into individual cesspits within the hospitals' campus. There are settling pond is existed within the hospital campus. Each toilet has its own cesspit.

36. Svay Rieng provincial referral hospital is located in Srah Vong village, Sangkat Svay Rieng, Svay Rieng municipality and province. This hospital is on state-owned land, and belongs to the Svay Rieng Provincial Department of Health. The civil works under the project/program will include refurbishment of the existing laboratory facility within the existing building and the construction of small shelter (7mx7m) for microwave-based waste management (integrated biomedical waste treatment and disposal) within the designated area. Medical waste (sharp/hazardous) is segregated from general waste. The medical waste is incinerated within the hospital campus while the general waste is stored on site then and transported off-site for disposal. The liquid waste from laboratory is discharged into individual cesspits within the hospitals' campus. The settling pond of hospital is unavailable. Each toilet has its own cesspit.

37. Chiphou/Bavet referral hospitals is located in Chrey Thom village, Sangkat Prey Angkonh, Bavet municipality, Svay Rieng province. This hospital is on state-owned land, and belongs to the Svay Rieng Provincial Department of Health. The civil works under the project/program will include minor repair of the existing laboratory facility within the existing building and the construction of small shelter (7mx7m) for microwave-based waste management (integrated biomedical waste treatment and disposal) within the designated area. Medical waste (sharp/hazardous) is segregated from general waste. The medical waste is incinerated within the hospital campus while the general waste is stored on site then and transported off-site for disposal. The liquid waste from laboratory is discharged into individual cesspits within the hospitals' campus. The settling pond of hospital is unavailable. Each toilet has it own cesspit.

38. Ponhea Krek district referral hospital is located in Pou Srok village, Koang Kang commune, Ponhea Krek district, Tboung Khmum province. This hospital is on state-owned land, and belongs to the Tboung Khmum Provincial Department of Health. The civil works under the project/program will include minor repair of the existing laboratory facility within the existing building and the construction of small shelter (7mx7m) for microwave-based waste management (integrated biomedical waste treatment and disposal) within the designated area. Medical waste (sharp/hazardous) is segregated from general waste. The medical waste is incinerated within the hospital campus while the general waste is stored on site then and transported off-site for

disposal. The liquid waste from laboratory is discharged into individual cesspits within the hospitals' campus. There are settling pond is existed within the hospital campus. Each toilet has its own cesspit.

39. Memot district referral hospital is located in Tboung Wat village, Memot commune and district, Tboung Khmum province. This hospital is on state-owned land, and belongs to the Tboung Khmum Provincial Department of Health. The civil works under the project/program will include minor repair of the existing laboratory facility within the existing building and the construction of small shelter (7mx7m) for microwave-based waste management (integrated biomedical waste treatment and disposal) within the designated area. Medical waste (sharp/hazardous) is segregated from general waste. The medical waste is incinerated within the hospital campus while the general waste is stored on site then and transported off-site for disposal. The liquid waste from laboratory is discharged into individual cesspits within the hospitals' campus. The settling pond of hospital is unavailable. Each toilet has its own cesspit.

40. Preah Norodom Sihanouk Tboung Khmum referral hospital is located in Soung Leach village, Sangkat Soung, Soung municipality and Tboung Khmum province. This hospital is on state-owned land, and belongs to the Tboung Khmum Provincial Department of Health. The civil works under the project/program will include minor repair of the existing laboratory facility within the existing building and the construction of small shelter (7mx7m) for microwave-based waste management (integrated biomedical waste treatment and disposal) within the designated area. Medical waste (sharp/hazardous) is segregated from general waste. The medical waste is incinerated within the hospital campus while the general waste is stored on site then and transported off-site for disposal. The liquid waste from laboratory is discharged into individual cesspits within the hospitals' campus. The settling pond of hospital is unavailable. Each toilet has its own cesspit.

41. Kratie provincial referral hospital is located in Kracheh village, Sangkat Kracheh and Kracheh municipality, Kratie province. This hospital is on state-owned land, and belongs to the Kratie Provincial Department of Health. The civil works under the project/program will include minor repair of the existing laboratory facility within the existing building and the construction of small shelter (7mx7m) for microwave-based waste management (integrated biomedical waste treatment and disposal) within the designated area. Medical waste (sharp/hazardous) is segregated from general waste. The medical waste is incinerated within the hospital campus while the general waste is stored on site then and transported off-site for disposal. The liquid waste from laboratory is discharged into individual cesspits within the hospitals' campus. The settling pond of hospital is unavailable. Each toilet has its own cesspit.

42. Snoul district referral hospital is located in Kbal Snoul village, Snoul commune and district, Kratie province. This hospital is on state-owned land, and belongs to the Kratie Provincial Department of Health. The civil works under the project/program will include minor repair of the existing laboratory facility within the existing building and the construction of small shelter (7mx7m) for microwave-based waste management (integrated biomedical waste treatment and disposal) within the designated area. Regarding solid waste management is segregated from medical waste (sharp/hazardous). The medical waste is incinerated within the hospitals 'campus while the general waste is stored and collected/transported to outsider. The liquid waste from laboratory is discharged into individual cesspits within the hospitals' campus. The settling pond of hospital is unavailable. Each toilet has it own cesspit.

43. Mondulkiri provincial referral hospital is located in Cham Bak village, Sangkat Spean Mean Chey, Senmonorom municipality, Mondulkiri province. This hospital is on state-owned land, and belongs to the Mondulkiri Provincial Department of Health. The civil works under the project/program will include minor repair of the existing laboratory facility within the existing building and the construction of small shelter (7mx7m) for microwave-based waste management (integrated biomedical waste treatment and disposal) within the designated area. Medical waste (sharp/hazardous) is segregated from general waste. The medical waste is incinerated within the hospital campus while the general waste is stored on site then and transported off-site for disposal. The liquid waste from laboratory is discharged into individual cesspits within the hospitals' campus. The settling pond of hospital is unavailable. Each toilet has its own cesspit.

44. Ratanakiri provincial referral hospital is located in Boeng Kanseng village, Sangkat Boeng Kanseng, Krong Banlung, Ratanakiri province. This hospital is on state-owned land, and belongs

to the Ratanakiri Provincial Department of Health. The civil works under the project/program will include minor repair of the existing laboratory facility within the existing building and the construction of small shelter (7mx7m) for microwave-based waste management (integrated biomedical waste treatment and disposal) within the designated area. Medical waste (sharp/hazardous) is segregated from general waste. The medical waste is incinerated within the hospital campus while the general waste is stored on site then and transported off-site for disposal. The liquid waste from laboratory is discharged into individual cesspits within the hospitals' campus. The settling pond of hospital is unavailable. Each toilet has its own cesspit.

45. Stung Treng provincial referral hospital is located in Prek village, Sangkat Stung Treng, Stung Treng municipality, Stung Treng province. This hospital is on state-owned land, and belongs to the Stung Treng Provincial Department of Health. The civil works under the project/program will include refurbishment of the existing laboratory facility within the existing building and the construction of small shelter (7mx7m) for microwave-based waste management (integrated biomedical waste treatment and disposal) within the designated area. Medical waste (sharp/hazardous) is segregated from general waste. The medical waste is incinerated within the hospital campus while the general waste is stored on site then and transported off-site for disposal. The liquid waste from laboratory is discharged into individual cesspits within the hospitals' campus. The settling pond of hospital is unavailable. Each toilet has its own cesspit.

46. Preah Vihear provincial referral hospital is located in Andoung Pou village, Sangkat Kampong Pranak, Preah Vihear municipality and province. This hospital is on state-owned land, and belongs to the Preah Vihearl Provincial Department of Health. The civil works under the project/program will include refurbishment of the existing laboratory facility within the existing building and the construction of small shelter (7mx7m) for microwave-based waste management (integrated biomedical waste treatment and disposal) within the designated area. Medical waste (sharp/hazardous) is segregated from general waste. The medical waste is incinerated within the hospital campus while the general waste is stored on site then and transported off-site for disposal. The liquid waste from laboratory is discharged into individual cesspits within the hospitals' campus. The settling pond of hospital is unavailable. Each toilet has its own cesspit.

47. Battambang provincial referral hospital is located in Prek Moha Tep village, Sangkat Svay Pao, Battambang municipality and province. This hospital is on state-owned land, and belongs to the Battambang Provincial Department of Health. The civil works under the project/program will include refurbishment of the existing laboratory facility within the existing building and the construction of small shelter (7mx7m) for microwave-based waste management (integrated biomedical waste treatment and disposal) within the designated area. Medical waste (sharp/hazardous) is segregated from general waste. The medical waste is incinerated within the hospital campus while the general waste is stored on site then and transported off-site for disposal. The liquid waste from laboratory is discharged into individual cesspits within the hospitals' campus. The settling pond of hospital is unavailable. Each toilet has its own cesspit.

48. Pailin provincial referral hospital is located in Phum Wat village, Sangkat Pailin, Krong Pailin and Pailin province. This hospital is on state-owned land, and belongs to the Pailin Provincial Department of Health. The civil works under the project/program will include refurbishment of the existing laboratory facility within the existing building and the construction of small shelter (7mx7m) for microwave-based waste management (integrated biomedical waste treatment and disposal) within the designated area. Medical waste (sharp/hazardous) is segregated from general waste. The medical waste is incinerated within the hospital campus while the general waste is stored on site then and transported off-site for disposal. The liquid waste from laboratory is discharged into individual cesspits within the hospitals' campus. The settling pond of hospital is unavailable. Each toilet has it own cesspit.

49. Sampao Lun district referral hospital is located in Tasda village and commune, Sampao lun district, Battambang province. This hospital is on state-owned land, and belongs to the Battambang Provincial Department of Health. The civil works under the project/program will include minor repair of the existing laboratory facility within the existing building and the construction of small shelter (7mx7m) for microwave-based waste management (integrated biomedical waste treatment and disposal) within the designated area. Medical waste (sharp/hazardous) is segregated from general waste. The medical waste is incinerated within the hospital campus while the general waste is stored on site then and transported off-site for

disposal. The liquid waste from laboratory is discharged into individual cesspits within the hospitals' campus. The settling pond of hospital is unavailable. Each toilet has it own cesspit.

50. Poipet referral hospital is located in Prochea Thorm village, Sangkat Phsa Kandal, Poipet municipality, Banteay Meanchey province. This hospital is on state-owned land, and belongs to the Banteay Meanchey Provincial Department of Health. The civil works under the project/program will include minor repair of the existing laboratory facility within the existing building and the construction of small shelter (7mx7m) for microwave-based waste management (integrated biomedical waste treatment and disposal) within the designated area. Medical waste (sharp/hazardous) is segregated from general waste. The medical waste is incinerated within the hospital campus while the general waste is stored on site then and transported off-site for disposal. The liquid waste from laboratory is discharged into individual cesspits within the hospitals' campus. There are settling pond is existed within the hospital campus. Each toilet has its own cesspit.

51. Thma Pouk district referral hospital is located in Kak Sen village, Thma Pouk commune and district in Banteay Meanchey province. This hospital is on state-owned land, and belongs to the Banteay Meanchey Provincial Department of Health. The civil works under the project/program will include minor repair of the existing laboratory facility within the existing building and the construction of small shelter (7mx7m) for microwave-based waste management (integrated biomedical waste treatment and disposal) within the designated area. Medical waste (sharp/hazardous) is segregated from general waste. The medical waste is incinerated within the hospital campus while the general waste is stored on site then and transported off-site for disposal. The liquid waste from laboratory is discharged into individual cesspits within the hospitals' campus. The settling pond of hospital is unavailable. Each toilet has it own cesspit.

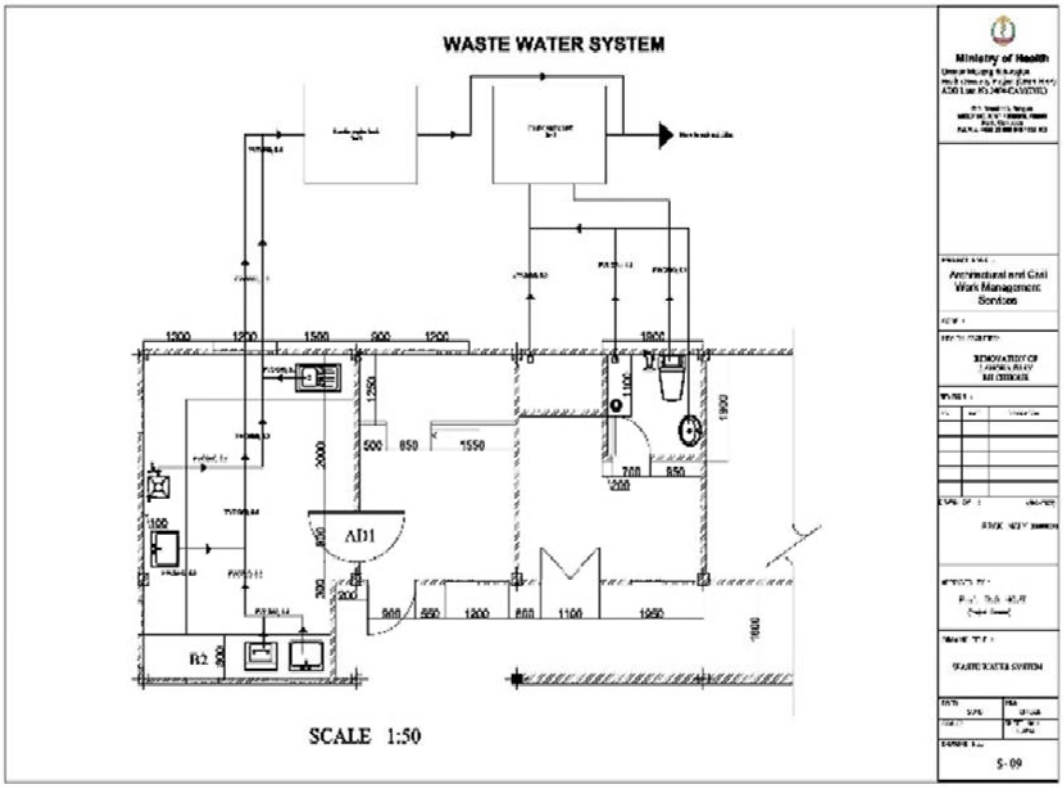
52. Cambodia-Japan Friendship provincial referral hospital (CJPRH) is located in Koh Keo village Ruessey Kroak commune, Mongkul Borey district, Banteay Meanchey province. This hospital is on state-owned land, and belongs to the Banteay Meanchey Provincial Department of Health. The civil works under the project/program will include minor repair of the existing laboratory facility within the existing building and the construction of small shelter (7mx7m) for microwave-based waste management (integrated biomedical waste treatment and disposal) within the designated area. Medical waste (sharp/hazardous) is segregated from general waste. The medical waste is incinerated within the hospital campus while the general waste is stored on site then and transported off-site for disposal. The liquid waste from laboratory is discharged into individual cesspits within the hospitals' campus. There are settling pond is existed within the hospital campus. Each toilet has its own cesspit.

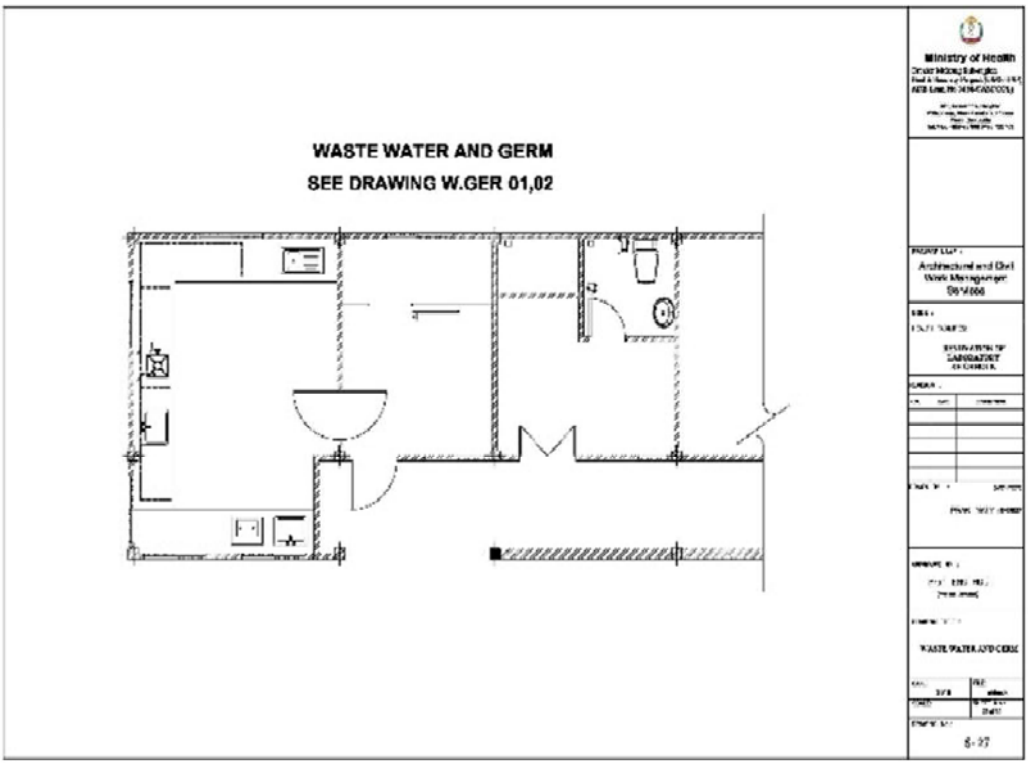
53. Moung Ruessey district referral hospital is located in Moung village and commune, Moung district, Battambang province. This hospital is on state-owned land, and belongs to the Battambang Provincial Department of Health. The civil works under the project/program will include minor repair of the existing laboratory facility within the existing building and the construction of small shelter (7mx7m) for microwave-based waste management (integrated biomedical waste treatment and disposal) within the designated area. Medical waste (sharp/hazardous) is segregated from general waste. The medical waste is incinerated within the hospital campus while the general waste is stored on site then and transported off-site for disposal. The liquid waste from laboratory is discharged into individual cesspits within the hospitals' campus. The settling pond of hospital is unavailable. Each toilet has its own cesspit.

54. The GMS-HSP project has the following components:

(i) Minor repair/renovation and refurbishment of twenty-seven (27) existing laboratory facilities of provincial and district referral hospitals. Typical survey drawings of the minor repair and refurbishment of laboratory facilities in each hospital are below:

Figure No. 1



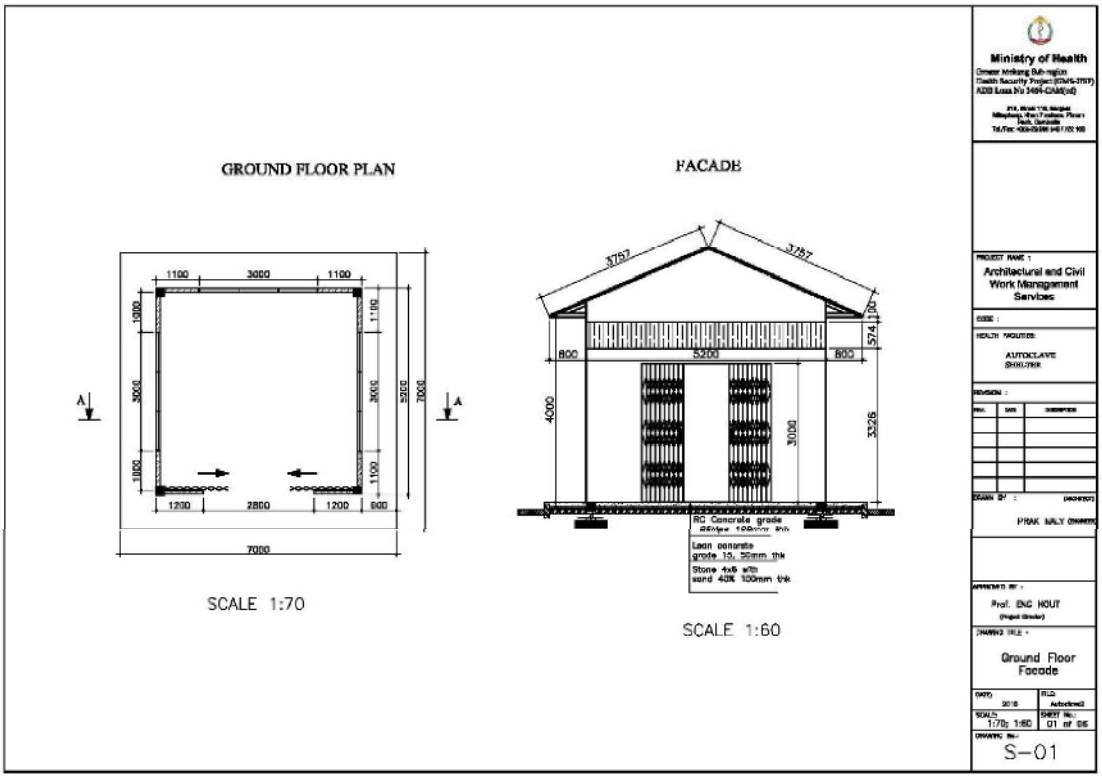


- (2). The construction of a building for microwave-based waste management in twenty-seven (27) provincial and district referral hospitals. The buildings are in the designated area (7mx7m) within the hospitals campus, mainly nearby the incinerators and CSIM [2]

[2] Brand Name

incinerators. A typical drawing for the building and waste treatment process (STERILWAVE 100) information is provided below. and prototype are typical detailed engineering designs of shelter and microwave-based waste management):

Figure No. 2



Microwave-based waste management */STERILWAVE 100 was designed and produced in France and certified as ISO 9001:2008 compliant, the Sterilwave technology has already attracted international interest. In just 30 minutes, the medical waste to be disposed of is transformed into a compact, dry, inert material, with a weight reduction of 25% and a volume reduction of 80% and it can be disposed of as normal waste to public dumping site of the municipality.*

∗***Function: Infectious Wastes Shredding and Microbial Inactivation/Decontamination.***

∗***Load capacity:*** *Weight 10 kg per cycle, Volume: 100 liters +/- 10%*

∗*Waste processing cycle time is just 30 minutes*

∗*Types of wastes that can be processed: Plastic materials, Glass materials, Single use surgical instrument (disposables), Personal protective equipment (PPE), Contaminated sharps, Hemodialysis wastes, Liquid bio-hazardous wastes, blood bags, urine bags, Anatomical and Pathological wastes, including placentae etc.*

(https://bertin-technologies.com/medias/bertin-launches-sterilwave-100-ultra-compact-solution-management-potentially-infectious)

Figure No. 3

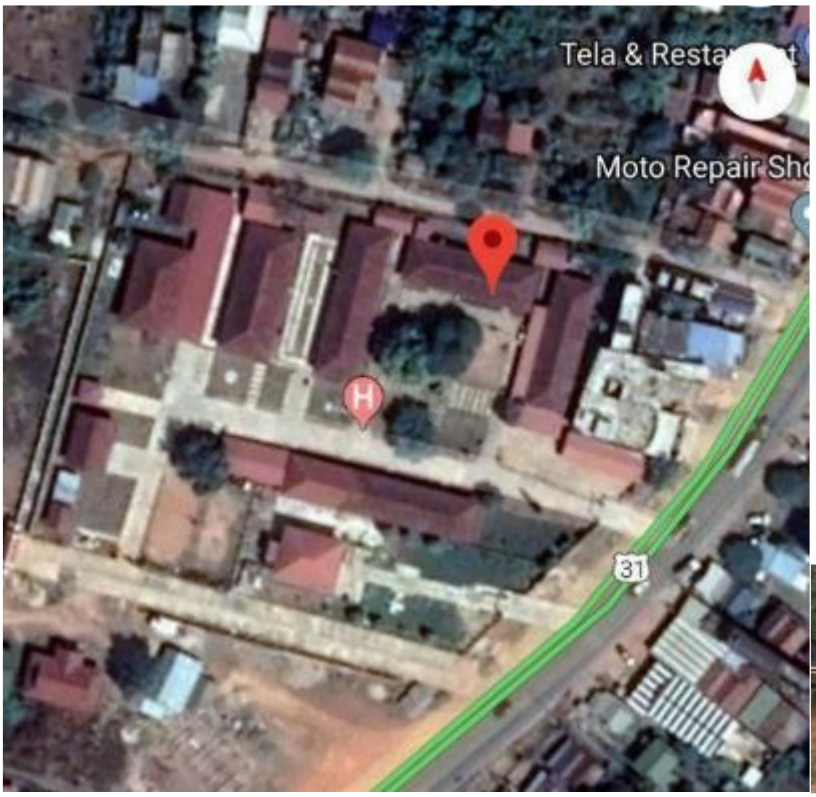
IV. DESCRIPTION OF THE ENVIRONMENT

A. Physical Resources

55. Cambodia lies in the southwestern part of the Southeast Asian peninsula and has a land area of 181,035 km² International borders are shared with Thailand to the west, the Lao People's Democratic Republic to the north, and the Socialist Republic of Viet Nam to the east and southeast. The country has a coastline of 440 km. There are three distinct topographic regions: the central plains, the flat coastal areas, and the mountain ranges with high plateaus. Two-thirds of the country's population live in the central lowlands. It is also naturally classified into four environmental regions, i.e. Plain, Tonle Sap, Coastal, and Plateau and Mountainous. The capital city Phnom Penh and the provinces of Tboung Khmum, Kandal, Prey Veng, Svay Rieng are situated in the Plain Region; Kratie, Mondulkiri, Ratanakiri, Stung Treng and Preah Vihear Provinces are in the Plateau and Mountainous Region; Kampot in the Coastal Region; and Banteay Meanchey, Battambang, and Pailin provinces are in the Tonle Sap Region. The following site baseline description of the 27 hospitals including photographs of typical hospital site, access roads and topography and soils:

56. Kaoh Thom district referral hospital is on state-owned land, and belongs to the Kandal Provincial Department of Health. The hospitals campus is not in a protected area and is not in an area of ecological interest or environmental sensitivity. The hospital campus area does not contain cultural, historical and archeological features. There are no landmines or UXOs within the hospital campus and it is at low risk of flooding. The common access road to this hospital is double bituminous sealed treatment (DBST) road of National Road No. 21. The hospital is situated in the Plain Region and is on a floodplain and nearby geology of organic deposits (swamps). The following is the aerial hospital site/map:

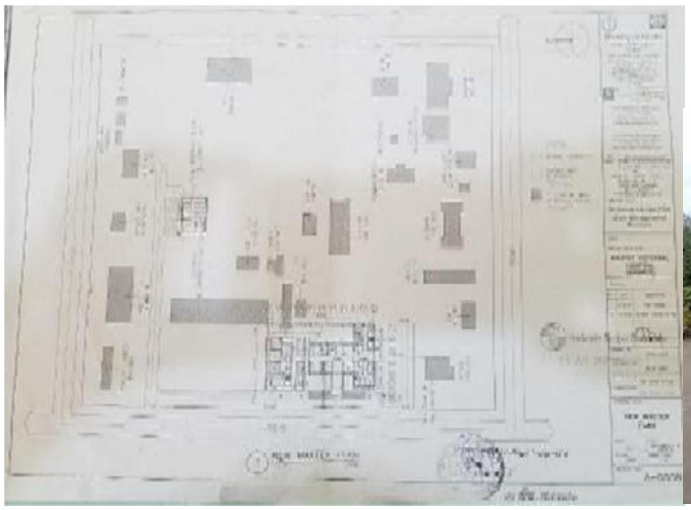
57. Angkor Chey district referral hospital is on state-owned land, has fencing enclosure, belonging to the Kampot Provincial Department of Health. The hospitals' campus is not in a protected area, and is not in an area of ecological interest or environmental sensitivity. The hospital campus area does not contain cultural, historical and archeological features. There are no landmines or UXOs within the hospitals 'campus, and it is at low risk of flooding. The common access road to this hospital is double bituminous sealed treatment (DBST) road of National Road No. 31. The hospital is situated in the Coastal Region and the geology of hospital is coastal plain deposits and sandstone. The following is the aerial hospital site/map:



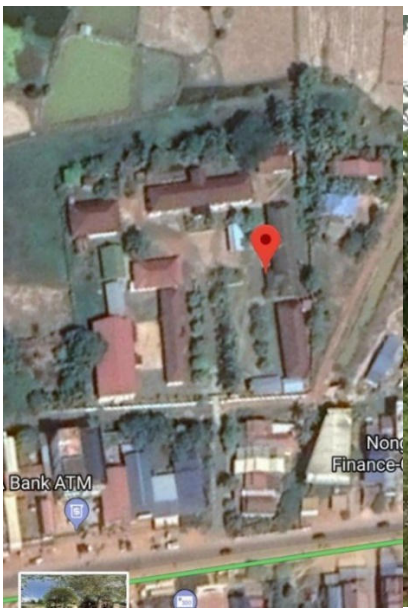
58. Kampong Trach district referral hospital is on state-owned land, and belongs to the Kampot Provincial Department of Health. The hospitals campus is not in a protected area and is not in an area of ecological interest or environmental sensitivity. The hospital campus area does not contain cultural, historical and archeological features. There are no landmines or UXOs within the hospital campus and it is at low risk of flooding. The common access road to this hospital is double bituminous sealed treatment (DBST) road of National Road No. 31. The hospital is situated in the Coastal Region and the geology of hospital is coastal plain deposits and sandstone. The following is the aerial hospital site/map:

59. Kampot provincial referral hospital is on state-owned land, and belongs to the Kampot Provincial Department of Health. The hospitals campus is not in a protected area and is not in an area of ecological interest or environmental sensitivity. The hospital campus area does not contain cultural, historical and archeological features. There are no landmines or UXOs within the

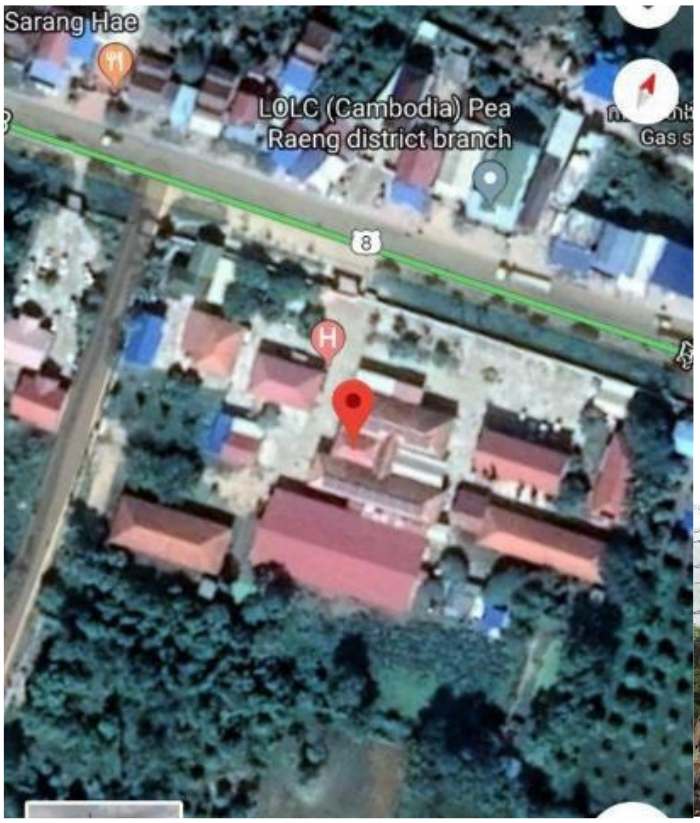
hospital campus and it is at low risk of flooding. The common access road to this hospital is double bituminous sealed treatment (DBST) road of National Road No. 3. The hospital is situated in the Coastal Region and the geology of hospital is coastal plain deposits and sandstone. The following is the master plan of hospital:



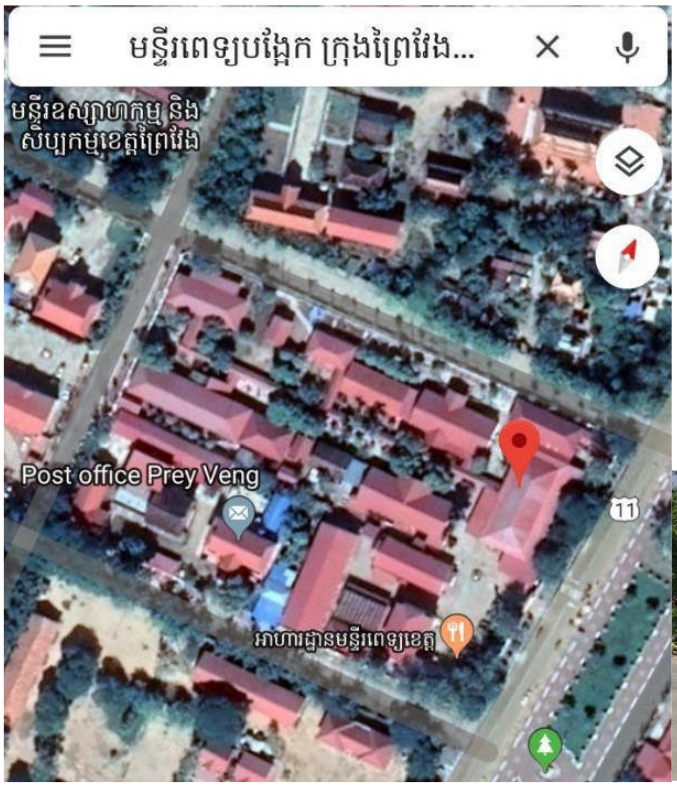
60. Chhuk district referral hospital is on state-owned land, and belongs to the Kampot Provincial Department of Health. The hospitals campus is not in a protected area and is not in an area of ecological interest or environmental sensitivity. The hospital campus area does not contain cultural, historical and archeological features. There are no landmines or UXOs within the hospital campus and it is at low risk of flooding. The common access road to this hospital is double bituminous sealed treatment (DBST) road of National Road No. 3. The hospital is situated in the Coastal Region and the geology of hospital is coastal plain deposits and sandstone. The following is the aerial hospital site/map:



61. Pea Reang district referral hospital is on state-owned land, and belongs to the Prey Veng Provincial Department of Health. The hospitals campus is not in a protected area and is not in an area of ecological interest or environmental sensitivity. The hospitals campus is not in a protected area and is not in an area of ecological interest or environmental sensitivity. The hospital campus area does not contain cultural, historical and archeological features. There are no landmines or UXOs within the hospital campus and it is at low risk of flooding. The common access road to this hospital is double bituminous sealed treatment (DBST) road of National Road No. 8. The hospital is situated in the Plain Region. The following is the aerial hospital site/map:



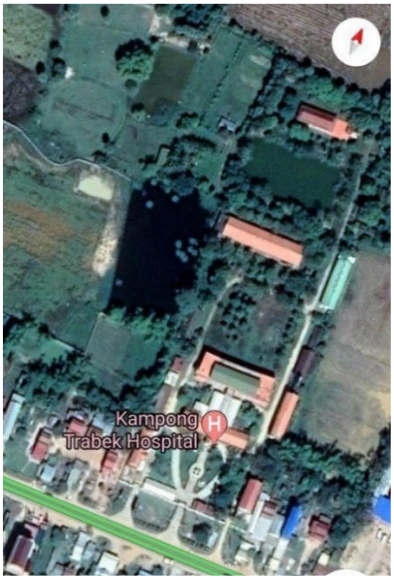
62. Prey Veng provincial referral hospital is on state-owned land, and belongs to the Prey Veng Provincial Department of Health. The hospitals campus is not in a protected area and is not in an area of ecological interest or environmental sensitivity. The hospital campus area does not contain cultural, historical and archeological features. There are no landmines or UXOs within the hospital campus and it is at low risk of flooding. Medical waste (sharp/hazardous) is segregated from general waste. The common access road to this hospital is double bituminous sealed treatment (DBST) road of National Road No. 11. The hospital is situated in the Plain Region. The following is the aerial hospital site/map:



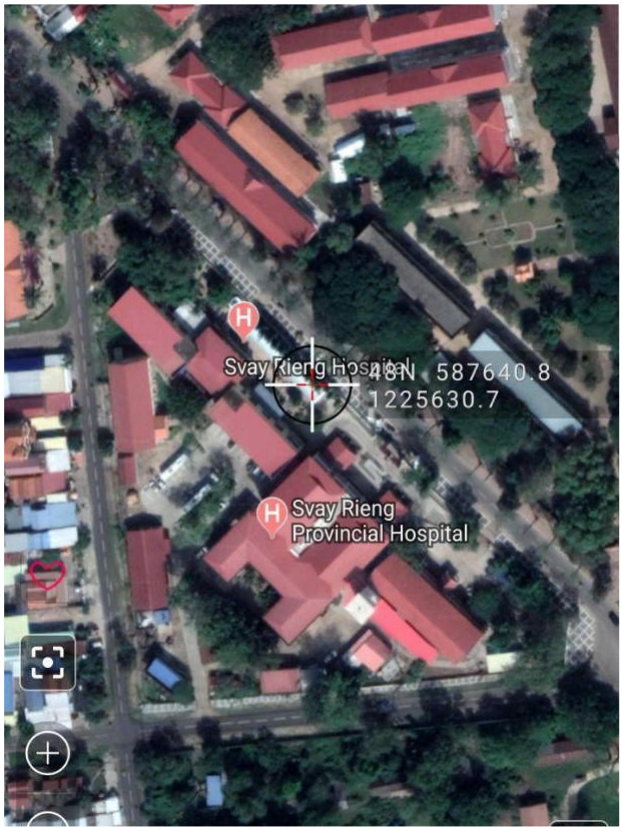
63. Preah Sdach district referral hospital is on state-owned land, and belongs to the Prey Veng Provincial Department of Health. The hospitals campus is not in a protected area and is not in an area of ecological interest or environmental sensitivity. The hospital campus area does not contain cultural, historical and archeological features. There are no landmines or UXOs within the hospital campus and it is at low risk of flooding. The common access road to this hospital is double bituminous sealed treatment (DBST) road of National Road No. 1. The hospital is situated in the Plain Region. The following is the aerial hospital site/map:

64. Kampong Trabaek district referral hospital is on state-owned land, and belongs to the Prey Veng Provincial Department of Health. The hospitals campus is not in a protected area and is not in an area of ecological interest or environmental sensitivity. The hospital campus area does not contain cultural, historical and archeological features. There are no landmines or UXOs within the

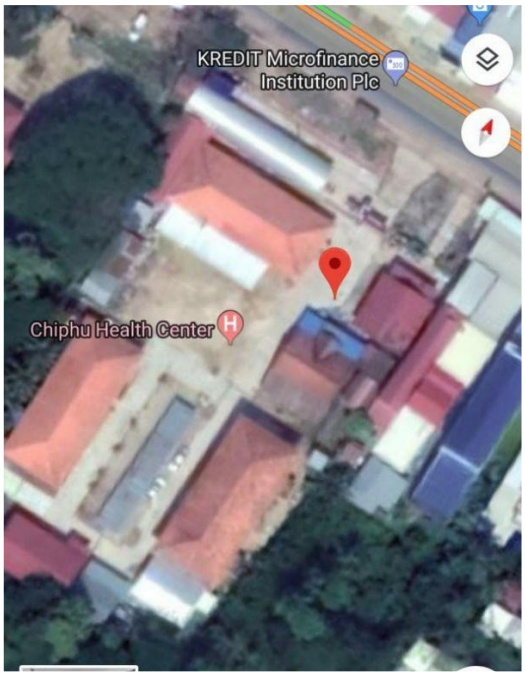
hospital campus and it is at low risk of flooding. The common access road to this hospital is double bituminous sealed treatment (DBST) road of National Road No. 1. The hospital is situated in the Plain Region. The following is the aerial hospital site/map:



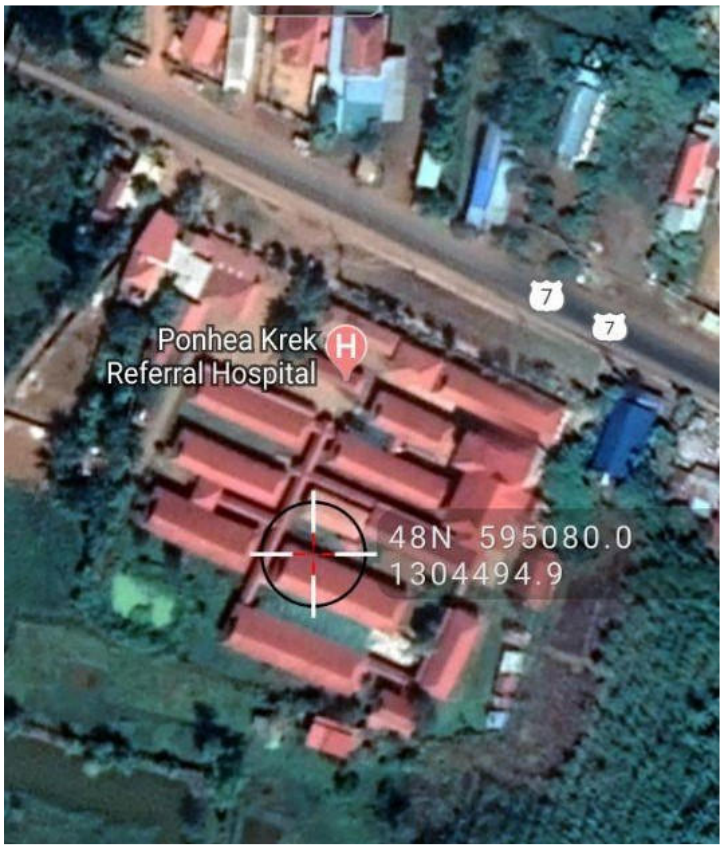
65. Svay Rieng provincial referral hospital is on state-owned land, and belongs to the Svay Rieng Provincial Department of Health. The hospitals campus is not in a protected area and is not in an area of ecological interest or environmental sensitivity. The hospital campus area does not contain cultural, historical and archeological features. There are no landmines or UXOs within the hospital campus and it is at low risk of flooding. Medical waste (sharp/hazardous) is segregated from general waste. The common access road to this hospital is double bituminous sealed treatment (DBST) road of National Road No. 1. The hospital is situated in the Plain Region. The following is the aerial hospital site/map:



66. Chiphou/Bavet referral hospitals is on state-owned land, and belongs to the Svay Rieng Provincial Department of Health. The hospitals campus is not in a protected area and is not in an area of ecological interest or environmental sensitivity. The hospital campus area does not contain cultural, historical and archeological features. There are no landmines or UXOs within the hospital campus and it is at low risk of flooding. The common access road to this hospital is double bituminous sealed treatment (DBST) road of National Road No. 1. The hospital is situated in the Plain Region. The following is the aerial hospital site/map:



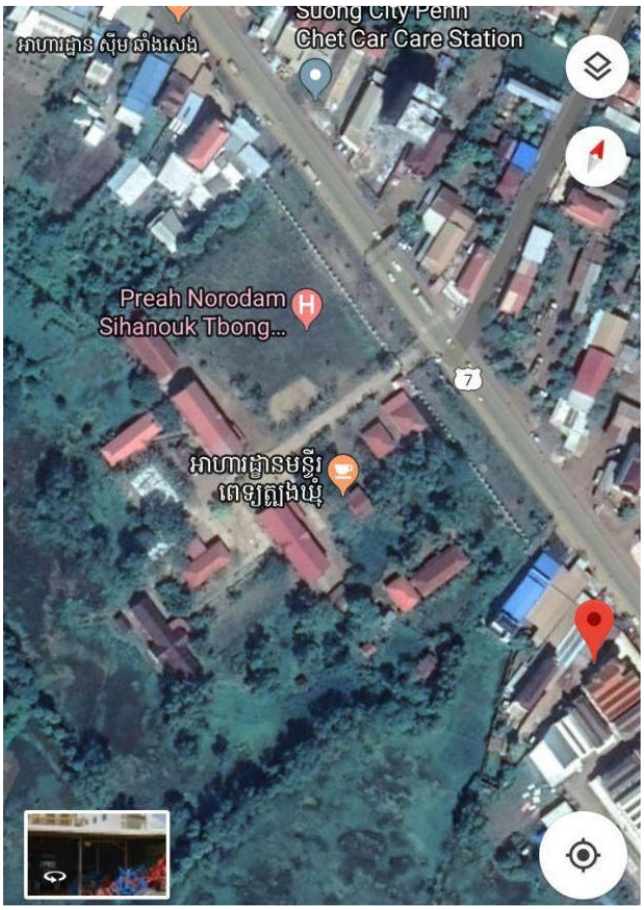
67. Ponhea Krek district referral hospital is on state-owned land, and belongs to the Tboung Khmum Provincial Department of Health. The hospitals campus is not in a protected area and is not in an area of ecological interest or environmental sensitivity. The hospital campus area does not contain cultural, historical and archeological features. There are no landmines or UXOs within the hospital campus and it is at low risk of flooding. The common access road to this hospital is double bituminous sealed treatment (DBST) road of National Road No. 7. The hospital is situated in the Plain Region. The following is the aerial hospital site/map:



68. Memot district referral hospital is on state-owned land, and belongs to the Tboung Khmum Provincial Department of Health. The hospitals campus is not in a protected area and is not in an area of ecological interest or environmental sensitivity. The hospital campus area does not contain cultural, historical and archeological features. There are no landmines or UXOs within the hospital campus and it is at low risk of flooding. The common access road to this hospital is double bituminous sealed treatment (DBST) road of National Road No. 7. The hospital is situated in the Plain Region. The following is the aerial hospital site/map:

69. Preah Norodom Sihanouk Tboung Khmum referral hospital is on state-owned land, and belongs to the Tboung Khmum Provincial Department of Health. The hospitals campus is not in a protected area and is not in an area of ecological interest or environmental sensitivity. The hospital campus area does not contain cultural, historical and archeological features. There are no landmines or UXOs within the hospital campus and it is at low risk of flooding. The common

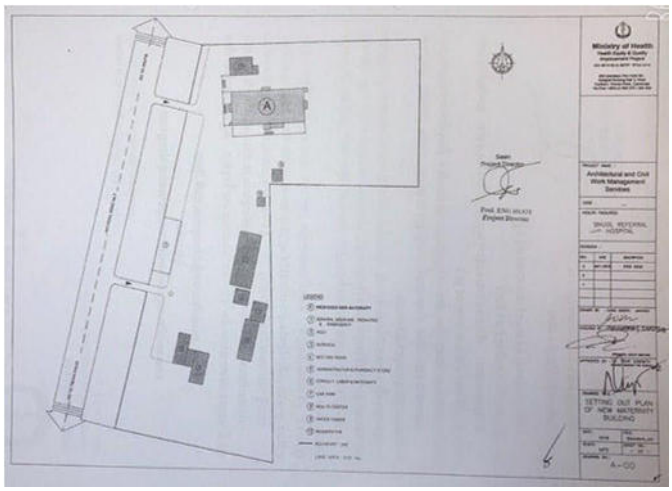
access road to this hospital is double bituminous sealed treatment (DBST) road of National Road No. 7. The hospital is situated in the Plain Region. The following is the aerial hospital site/map:



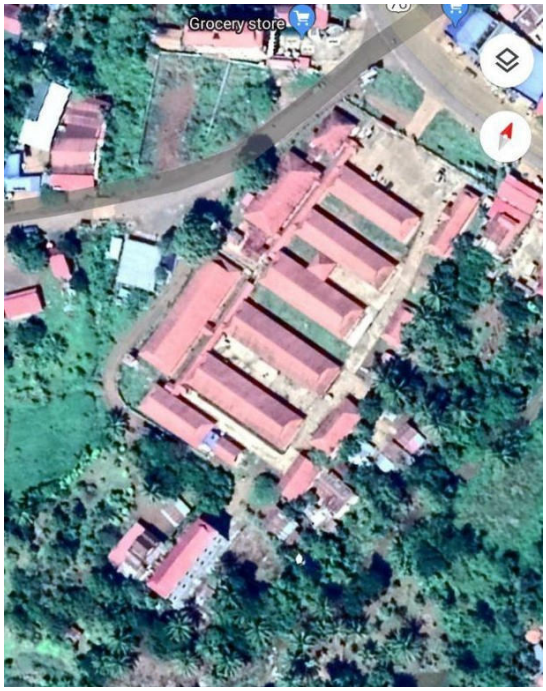
70. Kratie provincial referral hospital is on state-owned land, and belongs to the Kratie Provincial Department of Health. The hospitals campus is not in a protected area and is not in an area of ecological interest or environmental sensitivity. The hospital campus area does not contain cultural, historical and archeological features. There are no landmines or UXOs within the hospital campus and it is at low risk of flooding. The common access road to this hospital is double bituminous sealed treatment (DBST) road of National Road No. 7. The hospital is situated in the Plateau and Mountainous Region. The following is the aerial hospital site/map:

71. Snoul district referral hospital is on state-owned land, and belongs to the Kratie Provincial

Department of Health. The hospitals' campus is not in a protected area, and is not in an area of ecological interest or environmental sensitivity. The hospital campus area does not contain cultural, historical and archeological features. Landmines or UXOs is within the hospitals 'campus, it is at low risk of flooding. The common access road to this hospital is double bituminous sealed treatment (DBST) road of National Road No. 7. The hospital is situated in the Plateau and Mountainous Region. The following is the master plan of hospital:

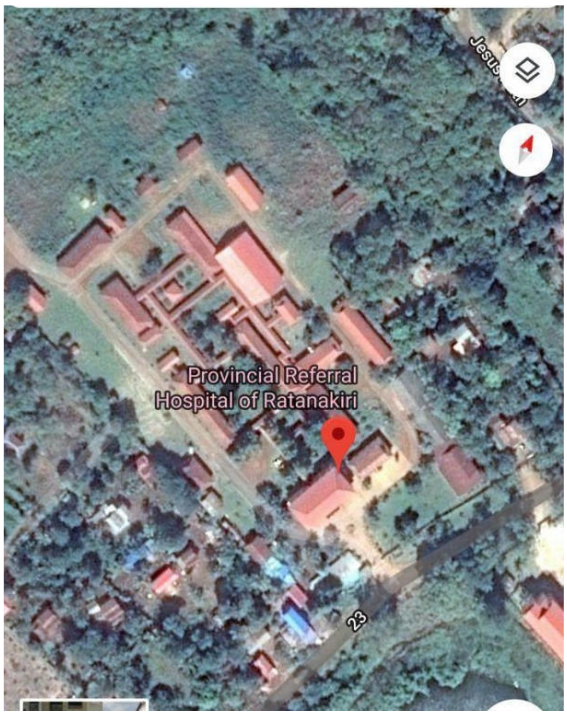


72. Mondulkiri provincial referral hospital is on state-owned land, and belongs to the Mondulkiri Provincial Department of Health. The hospitals campus is not in a protected area and is not in an area of ecological interest or environmental sensitivity. The hospital campus area does not contain cultural, historical and archeological features. There are no landmines or UXOs within the hospital campus and it is at low risk of flooding. The common access road to this hospital is double bituminous sealed treatment (DBST) road of National Road No. 76. The hospital is situated in the Plateau and Mountainous Region. The following is the aerial hospital site/map:

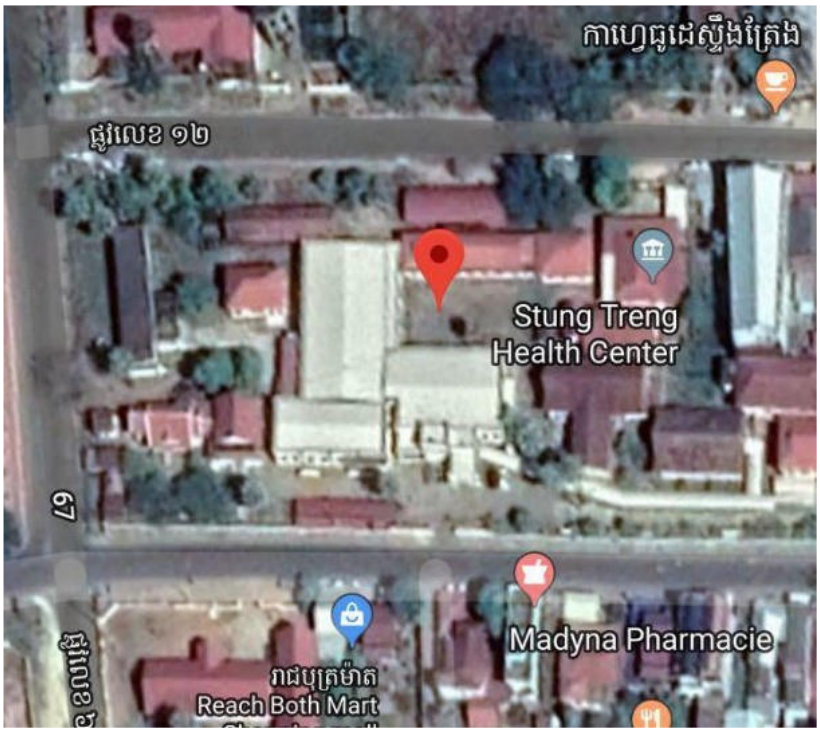


73. Ratanakiri provincial referral hospital is on state-owned land, and belongs to the Ratanakiri Provincial Department of Health. The hospitals campus is not in a protected area and is not in an area of ecological interest or environmental sensitivity. The hospital campus area does not contain cultural, historical and archeological features. There are no landmines or UXOs within the hospital campus and it is at low risk of flooding. The common access road to this hospital is double

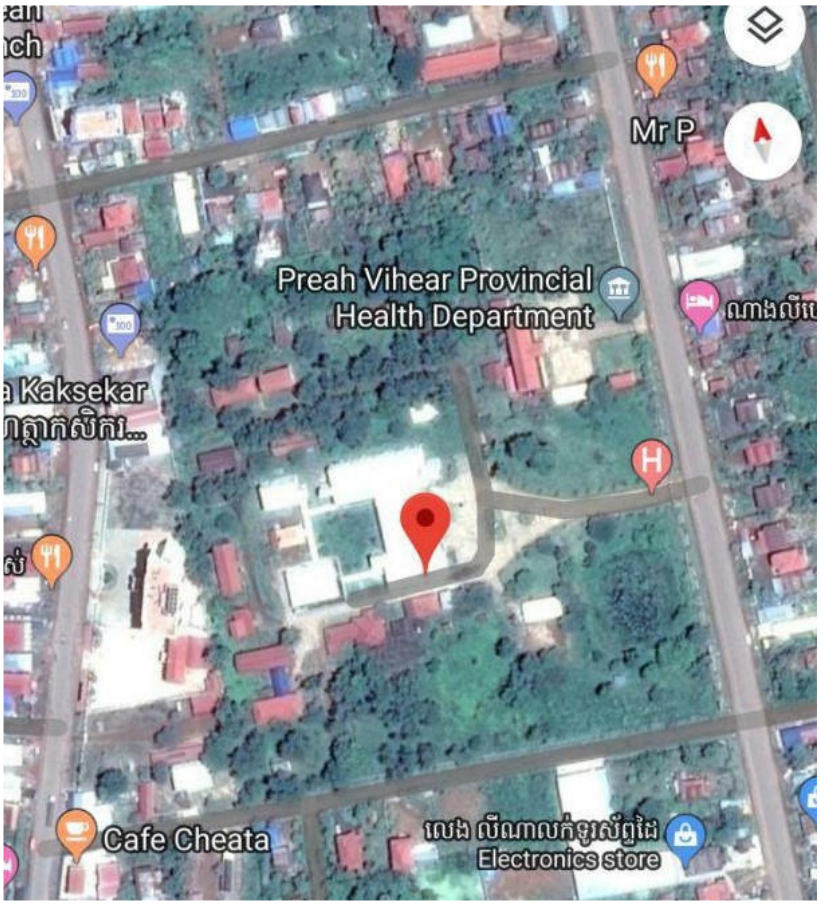
bituminous sealed treatment (DBST) road of National Road No. 78. The hospital is situated in the Plateau and Mountainous Region. The following is the aerial hospital site/map:



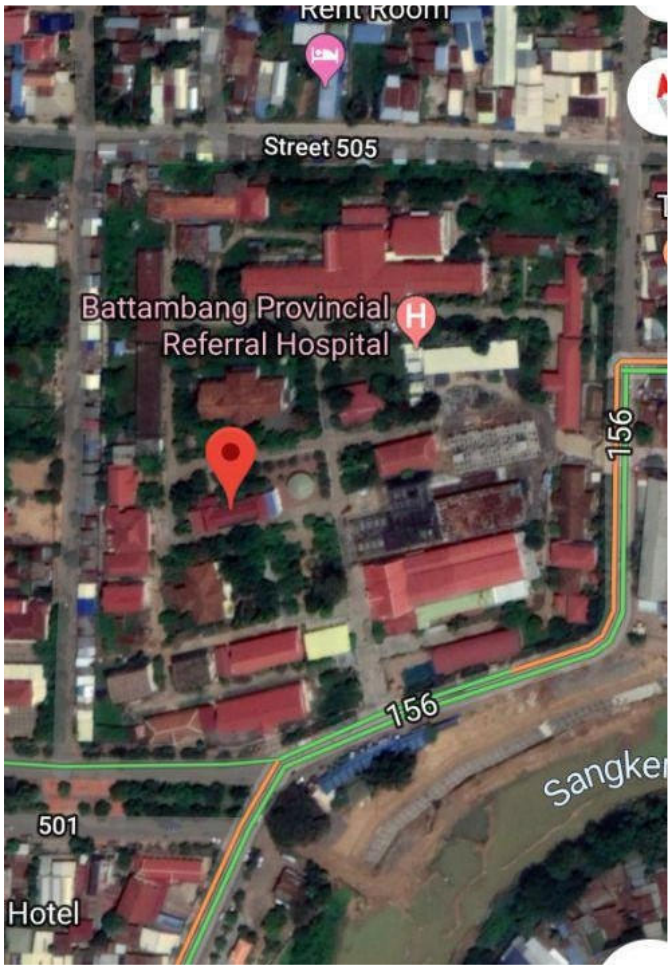
74. Stung Treng provincial referral hospital is on state-owned land, and belongs to the Stung Treng Provincial Department of Health. The hospitals campus is not in a protected area and is not in an area of ecological interest or environmental sensitivity. The hospital campus area does not contain cultural, historical and archeological features. There are no landmines or UXOs within the hospital campus and it is at risk of Mekong river water flooding. The common access road to this hospital is double bituminous sealed treatment (DBST) road of National Road No. 7. The hospital is situated in the Plateau and Mountainous Region. The following is the aerial hospital site/map:



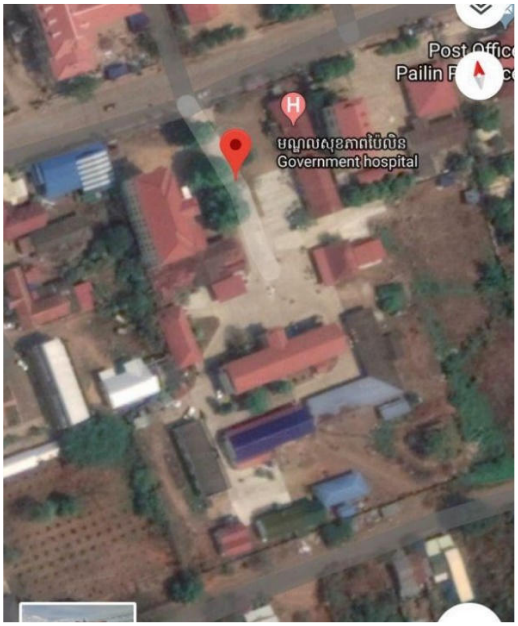
75. Preah Vihear provincial referral hospital is on state-owned land, and belongs to the Preah Vihearl Provincial Department of Health. The hospitals campus is not in a protected area and is not in an area of ecological interest or environmental sensitivity. The hospital campus area does not contain cultural, historical and archeological features. There are no landmines or UXOs within the hospital campus and it is at low risk of flooding. The common access road to this hospital is double bituminous sealed treatment (DBST) road of National Road No. 62. The hospital is situated in the Plateau and Mountainous Region. The following is the aerial hospital site/map:



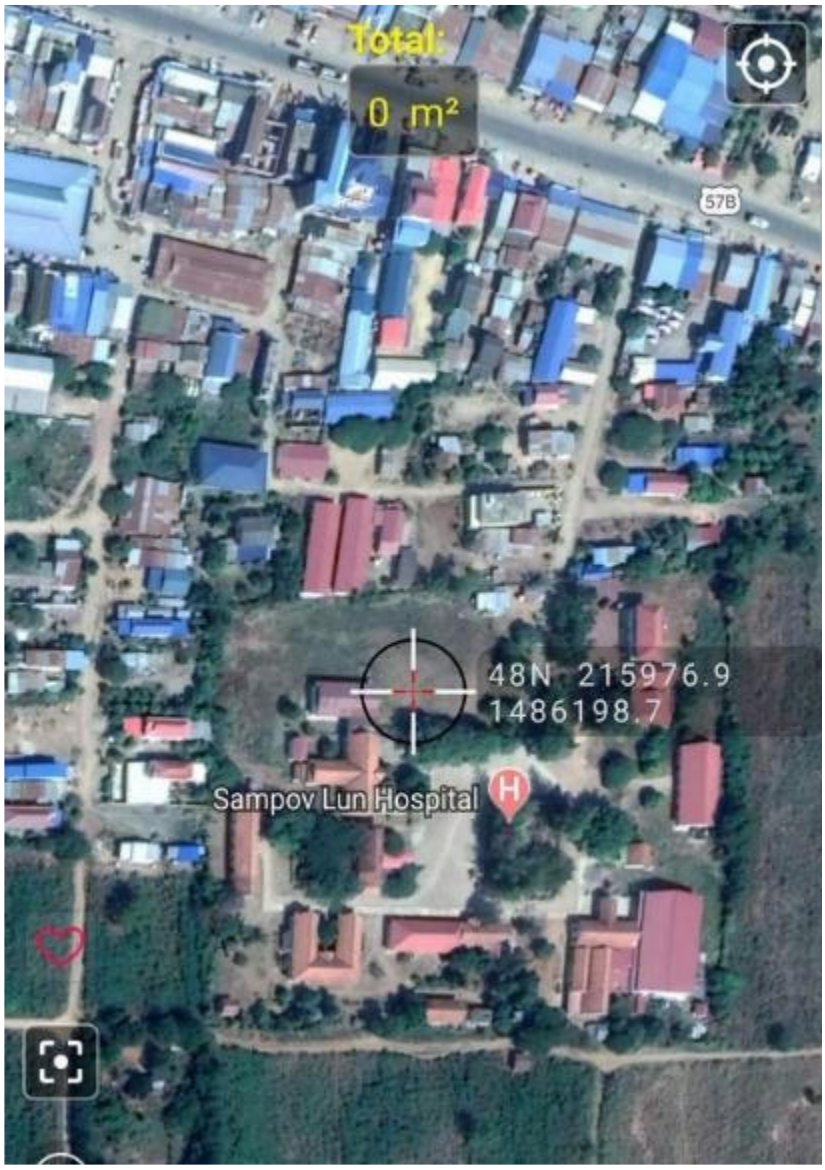
76. Battambang provincial referral hospital is on state-owned land, and belongs to the Battambang Provincial Department of Health. The hospitals campus is not in a protected area and is not in an area of ecological interest or environmental sensitivity. The hospital campus area does not contain cultural, historical and archeological features. There are no landmines or UXOs within the hospital campus and it is at low risk of flooding. The common access road to this hospital is double bituminous sealed treatment (DBST) road of National Road No. 5. The hospital is situated in the Tonle Sap Region. The following is the aerial hospital site/map:



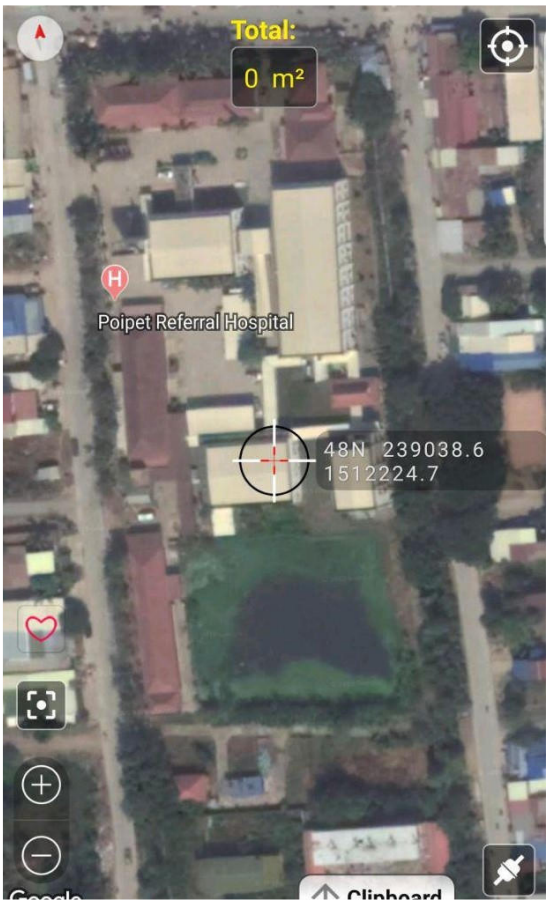
77. Pailin provincial referral hospital is on state-owned land, and belongs to the Pailin Provincial Department of Health. The hospitals campus is not in a protected area and is not in an area of ecological interest or environmental sensitivity. The hospital campus area does not contain cultural, historical and archeological features. There are no landmines or UXOs within the hospital campus and it is at low risk of flooding. The common access road to this hospital is double bituminous sealed treatment (DBST) road of National Road No. 57. The hospital is situated in the Tonle Sap Region. The following is the aerial hospital site/map:



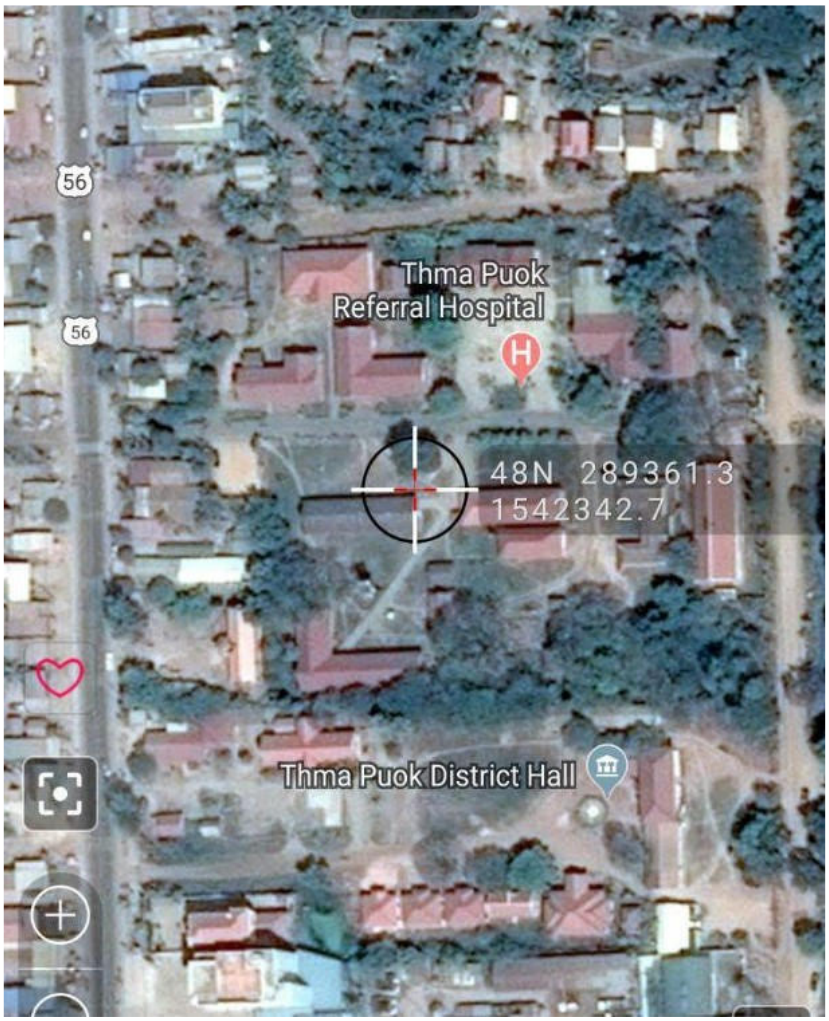
78. Sampao Lun district referral hospital is on state-owned land, and belongs to the Battambang Provincial Department of Health. The hospitals campus is not in a protected area and is not in an area of ecological interest or environmental sensitivity. The hospital campus area does not contain cultural, historical and archeological features. There are no landmines or UXOs within the hospital campus and it is at low risk of flooding. The common access road to this hospital is double bituminous sealed treatment (DBST) road of National Road No. 59. The hospital is situated in the Tonle Sap Region. The following is the aerial hospital site/map:



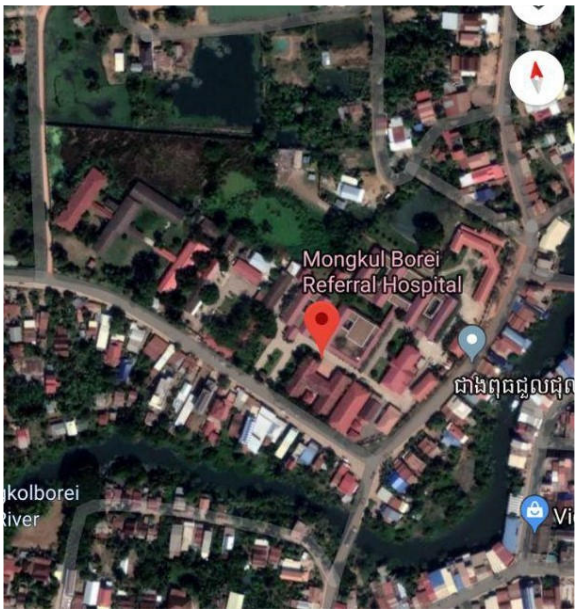
79. Poipet referral hospital is on state-owned land, and belongs to the Banteay Meanchey Provincial Department of Health. The hospitals campus is not in a protected area and is not in an area of ecological interest or environmental sensitivity. The hospital campus area does not contain cultural, historical and archeological features. There are no landmines or UXOs within the hospital campus and it is at low risk of flooding. The common access road to this hospital is double bituminous sealed treatment (DBST) road of National Road No. 5. The hospital is situated in the Tonle Sap Region. The following is the aerial hospital site/map:



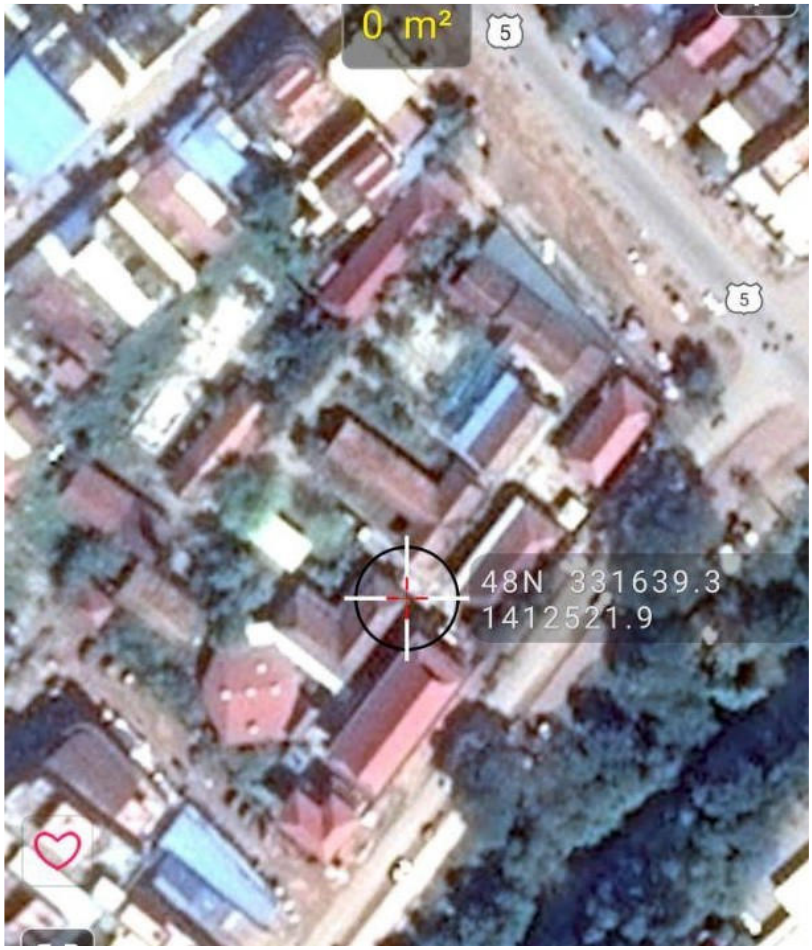
80. Thma Pouk district referral hospital is on state-owned land, and belongs to the Banteay Meanchey Provincial Department of Health. The hospitals campus is not in a protected area and is not in an area of ecological interest or environmental sensitivity. The hospital campus area does not contain cultural, historical and archeological features. There are no landmines or UXOs within the hospital campus and it is at low risk of flooding. The common access road to this hospital is double bituminous sealed treatment (DBST) road of National Road No. 56. The hospital is situated in the Tonle Sap Region. The following is the aerial hospital site/map:



81. Cambodia-Japan Friendship provincial referral hospital (CJPRH) is on state-owned land, and belongs to the Banteay Meanchey Provincial Department of Health. The hospitals campus is not in a protected area and is not in an area of ecological interest or environmental sensitivity. The hospital campus area does not contain cultural, historical and archeological features. There are no landmines or UXOs within the hospital campus and it is at low risk of flooding. The common access road to this hospital is double bituminous sealed treatment (DBST) road of National Road No. 5. The hospital is situated in the Tonle Sap Region. The following is the aerial hospital site/map:



82. Moung Ruessey district referral hospital is on state-owned land, and belongs to the Battambang Provincial Department of Health. The hospitals campus is not in a protected area and is not in an area of ecological interest or environmental sensitivity. The hospital campus area does not contain cultural, historical and archeological features. There are no landmines or UXOs within the hospital campus and it is at low risk of flooding. The common access road to this hospital is double bituminous sealed treatment (DBST) road of National Road No. 5. The hospital is situated in the Tonle Sap Region. The following is the aerial hospital site/map:



1. Climate and Air Quality

83. The monsoon dominates the climate and causes distinct wet and dry seasons. The southwest monsoon typically brings the rainy season from May to October. The northeast monsoon brings drier and cooler air from early November to March, then hotter air prevails in April and early May. Relative humidity is high all year, exceeding 90%, and barely below 50% in the dry season. Temperatures are uniform throughout the country and average 28 degrees Celsius. Wind velocity is on average at less than 3m/s.

2. Drainage Network and Surface Water and Groundwater Quality

84. Groundwater in Cambodia is plentiful but water quality is important as current and future development projects include accessing groundwater resources for drinking and irrigation. Additionally, various chemicals present in the groundwater can cause serious health problems or water that tastes unpleasant. Since 2005, Rural/research Development Institute (RDI) has tested over 10,000 wells as part of a program to characterize water quality throughout Cambodia. More than fifty percent of Cambodians rely on groundwater for drinking in the dry season (2008 census). The provincial referral hospitals are connecting and accessing to public municipal water supply and some are also accessing to ground water such as drilled wells/boreholes wells.

3. Water Resources

85. In rural area of Cambodia, people traditionally use rivers, lakes, ponds and shallow dug wells for their domestic water needs. In the rainy season, people mainly use rainwater for drinking and cooking. Access to clean water drinking (piped water supply) varies significantly throughout the country. From socio-economic survey of National Road No.56, 2012 shows that 37% sourced their drinking water from ponds or lakes while 34% have piped water supply and 16% fetched their drinking water from tube wells. Others 13% use river/canal or buy or catch rainwater for their daily consumption. Generally, in Cambodia only 30% of rural populations have access to safe drinking water.

B. Reference Baseline Data for Health Care Waste Management in Cambodia

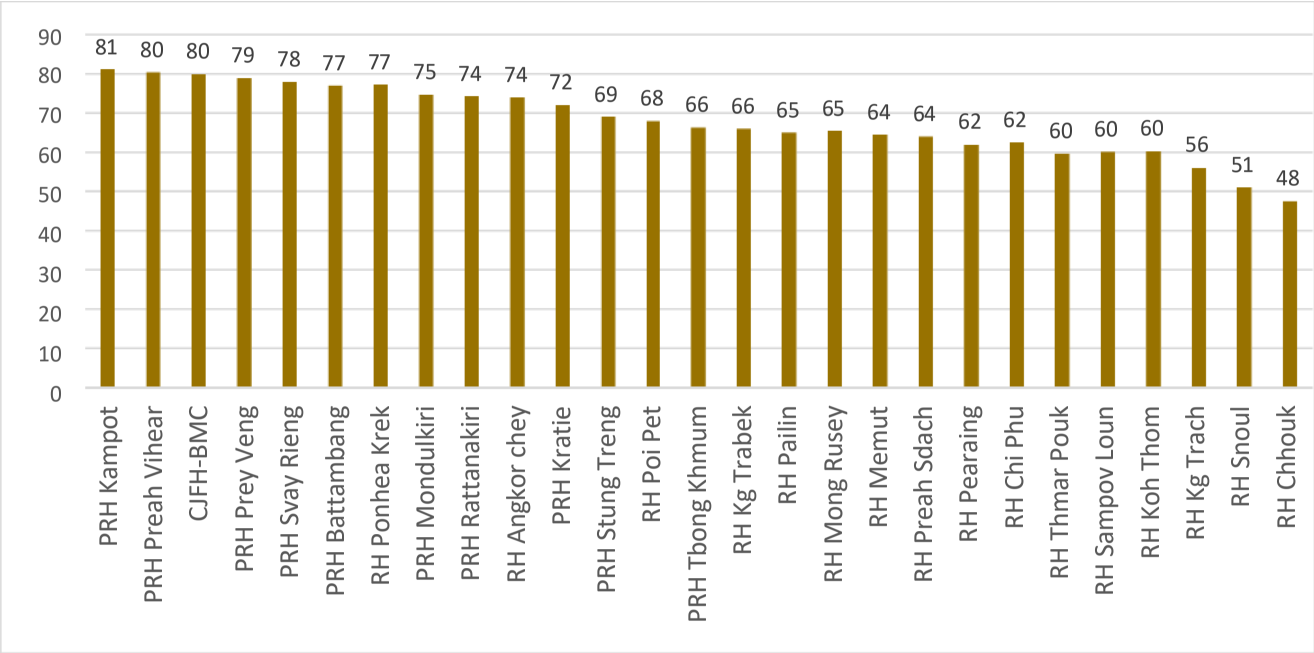
86. A key component of the project is the improvement of health care waste management practices in the project areas. The results of a review of existing health care waste management practices in the project areas are summarized below.

87. The baseline data from IPC assessing group conducted during June 2018 is presented here: The assessment team met first with the hospital management team, especially the RH Director and the IPC focal point/IPC committee. The team was split into 2 sub-groups (sub-team) of 3 persons in the way that each sub-group was assessing IPC and another sub-group was conducting assessment of laboratory.

88. The assessment consisted of interviewing the concerned staff and then observing/inspecting inside the wards and outside the wards as per module (or vice-versa). All hospital units, wards, e.g. laboratory, wastes management location, garbage disposal, incinerators, washing location, laundry etc., had been visited.

89. The graph below shows the acceptable minimum scores rank from the highest 81% to lowest 48%. There are 11 hospitals out of 27 hospitals having received scores more than 70%,

while 16 hospitals have received scores under 70%:

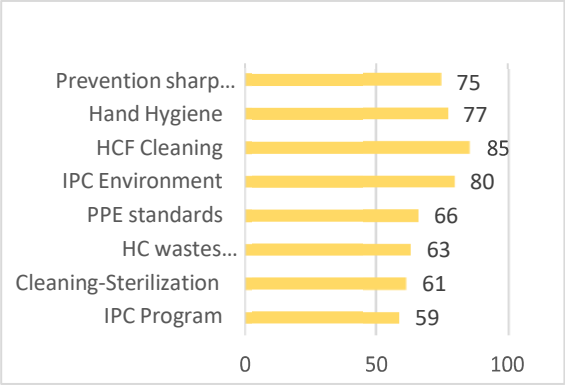


Gaps identification

90. Formally in the IPC National Guidelines, the IPC M&E assessment tools are composed of 9 components which requires scores equal or more than 70%. The component no. 9 related to "Isolation Precautions" is excluded from interpretation for the gap, due to this component is not common for all hospitals, mainly not related to Complementary Package Activities (CPA-1) and (CPA-2), [CPA is a classification of hospitals in terms of equipment and services such as CPA1, CPA2, CPA3…, the CPA1 is lowest level of hospital]. It is identified the gaps only within 8 components, focusing mainly on those whose scores are lower than scoring of 70%. The gaps identified in 4 components, (1) IPC program (organization and structure); (2) cleaning–Sterilization; (3) Health care wastes management; (4) Personal Protective Equipment (PPE).

Graph below shows the gaps to be addressed in the 4 components:

	IPC Components	Scores
1	IPC Program	59
6	Cleaning-Sterilization	61
7	HC wastes management	63
5	PPE standards	66
2	IPC Environment	80
3	HCF Cleaning	85
4	Hand Hygiene	77
8	Prevention sharp injuries	75



Criteria for the gap filling intervention priority

91. Based on the average score per Referral Hospital (RH), three categories of RH were established in terms of gaps filling intervention priority. The RH with a score lower than 60% should be the 1st group priority, in terms of equipment and consumables, as well as capacity building. Priority no.2 goes to hospitals whose scores are between 60% and 69% and priority no.3 for those whose scores are equal or above 70%. Consequently, 3 of 27 assessed RHs were in the first (1st) priority group, 13 RHs were in the second (2nd) priority group, and 11 RHs were in the third (3rd) priority group. Additional criteria priority should be for RH located closer to the border area and/or economic corridor. These findings should be taken into account while developing IPC improvement plan, e. g. proposed IPC activities and training plan and the establishment of the supply list of equipment and consumables.

1. Healthcare Waste Generation

92. Healthcare waste (HCW) generated from hospitals includes both non-hazardous waste and hazardous waste. No quantification of non-infectious and infectious waste components of HCW has been available in the project areas surveyed. WHO estimates that about 85% of the HCW from developing countries is non-infectious or generally risk-free healthcare waste, which is comparable to domestic waste. The remaining 15% of healthcare waste is regarded as hazardous and may create a variety of health risks. The MOH in Cambodia states that about 80% of the HCW generated in a health care facility is general waste while the remaining 20% comprises wastes that contain harmful microorganisms that can cause infections and outbreaks while other hazardous substances can affect human/animal lives and cause toxicity and environmental pollution, respectively. Hazardous healthcare waste can be classified into the following categories: infectious waste, highly infectious waste, sharps, pathological/anatomical waste, pharmaceutical waste, genotoxic waste, chemical waste, waste with high content of heavy metals, pressurized containers, and radioactive waste.

93. The amount of HCW generated depends on the hospital size and its scope of services. There has been no data recorded of HCW generation rates in Cambodia. According to surveys on HCW management conducted by the MOH in Vietnam and WHO, a provincial general hospital typically generates 0.64 kg/bed/day of general HCW and 0.14 kg/bed/day of hazardous HCW, while a district hospital typically generates 0.62 kg/bed/day of general HCW and 0.11 kg/bed/day of hazardous HCW. Assuming each provincial hospital has 200 beds, hence 0.64kgx200=128kg/day/hospital and hazardous HCW=0.14kgx200=28kg/day. In terms of the relative proportion of hazardous waste generated, infectious waste and pathological waste represents about 15%, sharps represent about 1%, chemical and pharmaceutical waste represents about 3%, other waste such as waste with high content of heavy metals, and pressurized containers share represent less than 1%.

2. Healthcare Waste Prevention and Minimization

94. The prevention of waste production and/or its reduction/minimization is not regularly practiced by healthcare establishments in Cambodia. Measures such as source reduction (modification of purchasing procedures, control of inventory, and production of less toxic materials), good management and control practices applied particularly to the purchase and use of chemicals and pharmaceuticals, and using of recyclable materials are not typically implemented.

95. Healthcare waste contains quantities of valuable and recyclable materials such as plastic, metals, paper and carton. However, waste recycling is not centrally implemented at hospital level despite the fact that it is carried out unofficially by the different offices.

3. Healthcare Waste Segregation

96. Cambodia has not formally implemented segregation of wastes into color-coded bags or containers. Within the hospitals that received supports (mainly IPC) from MOH, basic segregation has been introduced but without standard operating procedures or regular training provided. Other countries like Vietnam, for example have institutionalized the segregation of three separate containers into different colors: general waste in green bags, clinical waste in yellow bags, and toxic wastes in black bags. The MOH has started to develop its own system, contained in their National Guideline on Health Care Waste Management under the leadership of the MOH and in coordination with the relevant regulations by the MOE as the regulatory body. In other developing countries, sharps are segregated and placed into rigid containers with certain specifications to avoid accidental punctures or spillage during handling. In Cambodia, the provincial hospitals who were interviewed to be accountable for the sharps. However, their treatment and ultimate disposal has not progressed into something environmentally acceptable. The provincial hospitals after collecting the hazardous wastes from the district hospitals, either incinerate them using low-temperature open incinerators or bury them at unsecured waste pits within their property boundaries. The successful practice of waste segregation and disposal is one of the biggest challenges in HCW management in most developing countries such as Cambodia. There are limitations reported, as follows:

(i) Knowledge, attitude and practices among waste generators including hospital staff, patients and visitors are unsatisfactory
(ii) Supply of equipment for waste segregation, especially sharp containers is insufficient in both the district hospitals and health centers as a consequence of inadequate funding
(iii) No system has been generally introduced as a policy by the relevant authorities for enforcement

4. Healthcare Waste Storage

97. All of the visited district hospitals do not have a formally designated place to store healthcare waste except for different cans and bags of different sizes and materials. Most of the storage containers in district hospitals, do not meet design and operating regulations because of the following shortcomings:

(i) The storage areas do not incorporate separate places for different categories of healthcare waste. As a result, general waste and clinical waste that were segregated at sources and separately collected and transported are mixed again at storage places. Chemical waste is not collected and centrally stored. Liquid wastes are disposed of in the sinks although some of the hospitals have separate septic vaults for liquid wastes for wastes are disposed.
(ii) The storage areas do not have roofs and locks. Unauthorized people and animals can easily access hazardous waste
(iii) Storage duration often exceeds 24 hours in hot weather.

5. Healthcare Waste Collection

98. All target hospitals provincial and district hospitals were surveyed, the staff assigned to be responsible for collecting healthcare waste from the generation point to interim storage points in the departments have been generally on an ad-hoc basis. No institutionalized committees have been formed to take on the function. Some weaknesses in collection have been observed in the region as follows:

(i) Provision of equipment, waste containers in different sizes are not sufficient

(ii) There is no budget appropriation for staff nor equipment and materials to meet these recurring needs
(iii) Design of hazardous waste containers do not meet requirements
(iv) Codification and labeling, waste bags and containers, especially those for clinical waste and chemical waste are not properly color-coded and labeled

6. Healthcare Waste Transportation

99. Some primary health care workers are made responsible for internal collection from the district hospitals. All of the district hospitals visited lack specialized equipment for waste transportation. Hazardous waste is often transported by hand causing spillage and spread of disease throughout the hospital. Internal transportation plans in which the timetable and route of transportation are clearly identified are not available.

100. No private contractors or responsible government agency transports general waste out of the hospitals to a disposal facility. The district hospitals themselves manage their HCW internally, except for donor-provided sharps safety boxes and certain anatomical wastes that the districts send to the provincial hospitals for disposal.

7. Healthcare Waste Treatment

101. No models for health care waste treatment were observed in the district hospitals visited.

Healthcare waste treatment technologies applied in the region are (i) medium temperature incineration, (ii) low temperature incineration, (iii) waste burial, (iv) steam autoclave, (v) chemical disinfection;

(i) Medium temperature incineration: Pyrolytic incinerators that incinerate waste at

800 – 900^{O}C are reported to be used at the provincial hospitals but these have not been confirmed by actual visits. The emissions from incinerators have not been monitored since they were installed, but polluting gas emissions and high operating costs are reported.

(ii) Low temperature incineration: Drum incinerators, brick incinerator or one chamber, open incinerators are still common in district hospitals even though their design is out of date. Because of low effectiveness and high environmental impacts, such incinerators are no longer recommended. The gas emissions from these incinerators have reportedly been very polluted.

(iii) Waste burial: District hospitals bury healthcare waste on their premises. Safe burial of healthcare waste is recommended by WHO. However, in comparison with requirements of sanitary landfill, the bury pits observed in hospitals often have the following shortcomings: (i) inadequate sealing of base and sides to minimize the movement of wastewater or leachate off site, (ii) no presence of site personnel capable of effective control of daily operations, (iii) no surface water collection, (iv) access to site and working areas difficult for waste delivery and site vehicles, (v) lack of surface water collection trenches around site boundaries, (vi) lack of a final cover to minimize rainwater infiltration when each phase of the landfill is completed

(iv) Wet thermal disinfection: Steam autoclaves are commonly used by hospitals to primarily treat highly infectious waste. Although wet thermal disinfection has been introduced in Cambodia at present, application of autoclave for healthcare waste treatment is still limited to microbiological laboratories where highly infectious waste is mostly generated.

(v) Chemical disinfection: Using disinfectants to treat contaminated materials is very common in provincial and district hospitals. However, application of chemical disinfection for healthcare waste treatment, particularly for highly infectious waste treatment is still limited to microbiological laboratories and in areas of infectious disease outbreaks.

8. Healthcare Waste Disposal

102. The Healthcare Waste including Plastic materials, Glass materials, Single use surgical instrument (disposables), Personal protective equipment (PPE), Contaminated sharps, Hemodialysis wastes, Liquid bio-hazardous wastes, blood bags, urine bags, Anatomical and Pathological wastes, including placentae etc. to be disposed of is transformed into a compact, dry, inert material, with a weight reduction of 25% and a volume reduction of 80% and it can be disposed of as normal waste to the municipal dump site.

9. Wastewater Collection and Treatment

103. Hospital wastewater includes rainwater, wastewater generated from healthcare activities and wastewater from toilets. Old hospitals often have a collection system for storm water, a collection system and septic tanks for wastewater from toilets but only a few of those visited have separate collection lines and separate septic tanks for wastewater generated from healthcare activities. In consequence, wastewater from healthcare activities with a high content of pathogens and certain amount of pharmaceuticals and chemicals is discharged into the storm water system line or discharged onto the land without any treatment. Beside these weaknesses in design, there are weaknesses in operation and maintenance in terms of wastewater collection and treatment as follows:

(i) Hospital staff often discharge chemical and pharmaceutical waste into wastewater collection systems. This practice can harm the wastewater treatment plant, if any.

(ii) In the district hospitals areas visited, staff and patients do not know how to properly maintain toilet and sanitary facilities in the hospitals. This often results in

blockages of the wastewater collection system. Regular and corrective maintenance of wastewater collection system is rarely carried out.

V. SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

A. Rapid Environmental Assessment

104. In order to identify potential environmental impacts of the project components, the initial environmental screening was first carried out using the ADB rapid environmental assessment forms (REAs) to screen the proposed activities required for the installation of new or improved laboratory facilities/equipment such as minor repair, construction of building for microwave-based waste management and improvement works on the provincial and district hospitals at border provinces, (Please see Appendix 2 for the form used). While the district and provincial hospitals are all existing facilities and whatever improvements are introduced bring mostly positive impacts for the environment, the REAs categorized most of the project activities as Category B because the project involves the management of infectious, hazardous, medical solid waste and wastewater and the risks inherent in the handling of laboratory wastes, and the diagnostic activities in managing highly infectious diseases at the border towns of the target border district and provincial hospitals.

105. The ADB safeguard policies require that the project's activities need to be carefully considered to avoid and/or to minimize the negative impacts on the natural environment and social environment (including environmental public health and occupational health), and provide the appropriate measures to mitigate such impacts. In accordance with the ADB guidelines, the potential impacts of medical solid and liquid wastes including laboratory wastes, being hazardous along with deficient sanitation and laundry facilities and the lack of effective wastewater equipment and treatment systems categorizes the health facilities as having significant potential negative environmental impacts that need to be mitigated.

B. Environmental Assessment Methodology

106. A survey was conducted by the safeguards consultant and the IPC consultant team in all 27 target provincial and district referral hospitals. The main objectives of the survey were to:

(i) Assess the current practices and environmental conditions focused on the medical waste (solid and liquid) management of the health care facilities (provincial and district referral hospitals);
(ii) Met and discussing with hospital management, involved staff and IPC focal points consult them about their needs and plans about the environmental management of the sub-components of the health security project to institute environmental safeguards from the impacts of laboratory waste, infectious disease bio-hazards, hospital safety and hygiene for infection prevention and control, and medical solid and liquid waste management; and
(iii) Collect environmental baseline data of the representative provinces included in the target border areas.

107. The site surveys were carried out by a combination of methods
i.e. observation, photo-documentation, data/document review and analysis, and interview with hospital management, involved staff and IPC focal points. The survey team earlier developed sets of Rapid Environmental Assessment (REA) checklists for health care facilities. The data and information on environmental issues (focused on medical solid and liquid waste management and hospital safety and hygiene for infection prevention and control) of 27 target hospitals.

The Safeguards Consultant and IPC team conducted the meetings with the Provincial and district

referral hospital management, staff and Laboratory staff/IPC focal points were held with participation of the relevant staff to discuss the environmental situation in their respective areas focusing on the medical and laboratory waste management.

C. Potential Environmental Impacts and Mitigating Measures

108. For the purposes of the assessment, the following categories of impacts have been developed:

(i) **NO IMPACT:** The potential impact of the project is assessed as NO IMPACT if the project activity is physically removed in space or time from the environmental component, or if the impact is so small as to be un-measurable (i.e. negligible).

(ii) **MAJOR IMPACT – POSITIVE OR NEGATIVE:** An impact is said to be MAJOR if the project has the potential to affect an environmental component. The following criteria were used to determine whether a given impact is MAJOR:
   a. spatial scale of the impact (site, local, regional, or national/ international);
   b. time horizon of the impact (short, medium, or long term);
   c. magnitude of the change in the environmental component brought about by the project activities (small, moderate, large);
   d. importance to local human populations;
   e. compliance with international, national, provincial, or district environmental protection laws, standards, and regulations;
   f. compliance with ADB guidelines, policies, and regulations.

(iii) **MINOR IMPACT – POSITIVE OR NEGATIVE:** If an impact occurs but does not meet the criteria for a Major Impact it is assigned the category MINOR. Minor impacts occur along a spectrum ranging from those impacts that are close to being major impacts to those that are close to being negligible impacts. The judgments made in relation to the position of specific impacts along this spectrum are discussed in the text accompanying the environmental screening.

(iv) **UNKNOWN IMPACT:** The potential impact of the project will be assessed as being UNKNOWN if the magnitude of the effect cannot be predicted for any of the following reasons:
   a. the nature and location of the project activity is uncertain;
   b. the occurrence of the environmental component within the study area is uncertain;
   c. the time scale of the effect is unknown; or
   d. the spatial scale over which the effect may occur is unknown.

109. These categories have been applied to other ADB infrastructure projects and have been adapted from ADB, *Safeguard Policy Statement (2009)*

D. Screening of Environmental Impacts of Project Components

110. The purpose of this section is to undertake further screening of typical environmental impacts of the project components/sub-components. The screening addresses the potential impacts of the structural processes to be implemented and relevant activities under the loan

program, namely: (i) minor repair and improvement works; (ii) laboratory equipment commissioning including infection prevention and control (IPC) services; iii) operations of the existing solid waste management facilities and (iv) operation of existing wastewater treatment facilities. Since the project does not involve civil works construction, the environmental assessment covers the pre-procurement, procurement (including the commissioning stage), and the operation stage of the project as described fully in Section II-G. Only potential impacts that have direct and relevant significance are listed in the environmental screening (Appendix 1).

111. The following key is used in the environmental screening.

NO impact	O
MINOR NEGATIVE impact	X
MAJOR NEGATIVE impact	XX
MINOR POSITIVE impact	+
MAJOR POSITIVE impact	++
UNKNOWN impact	?

E. Findings of the Environmental Assessment

112. The TOR initially categorized this project as requiring an Initial Environmental Examination (IEE) Report and an Environmental Management Plan both of which are required for a Category B Project. It is understood that this project was tentatively classified as a Category B from the ADB project documents during an initial screening of anticipated potential environmental impacts based on the concept document. This categorization was examined through the representative visits to the different project sites and the proposed project component descriptions and how the project proponent intends to mitigate the potential negative environmental impacts of the project.

113. In accordance with the ADB's *Safeguards Policy Statement* (2009), Category B Projects are those judged to have some adverse environmental impacts, but of lesser degree and/or significance than those for Category A projects that require a full-blown Environmental Impact Statement arising from major adverse impacts on the environment. For a Category B project, an IEE is required to determine whether or not significant environmental impacts warranting an Environmental Impact Assessment (EIA) are likely. If an EIA is not needed, the IEE is regarded as the final environmental assessment report.

114. In Cambodia, the final list of target hospitals from the border states and region has been finalized by the government through the MOH, and their respective environmental assessments. The project is expected to have positive environmental impacts based on the level of investments in laboratory equipment to improve diagnostics of emerging diseases in support of communicable diseases control. On the other hand, this project is not supporting civil works construction for waste management. It is expected that the existing Solid Waste Management (SWM) equipment and wastewater treatment facilities will not be able to meet the environmental standards consistently.

115. During the project's life, the environmental assessment will continue particularly for the medical solid waste and the wastewater treatment facilities. If not upgraded or properly

maintained, there will be a good chance that the assessment will also continue to have negative environmental impacts. It is very important therefore to have an environmental management plan in place. Within the plan should be a monitoring framework.

116. Separately, the projects will undergo environmental impact assessment in accordance with the relevant Cambodia legislation on environmental pollution laws, medical solid and liquid waste management, wastewater treatment facilities, and environmental health and safety and ADB's SPS.

VI. INSTITUTIONAL REQUIREMENTS AND ENVIRONMENTAL MONITORING PLAN

A. Institutional Arrangements

117. Table 4 summarizes the proposed environmental management responsibilities of key parties involved in the project.

Table 4: Environmental Management Institutional Arrangements

Agency	Environmental Management Responsibilities
ADB	Sign loan agreement with Government of Cambodia including environment- related covenants Review of site specific SEMPs and environmental monitoring reports Review of EMP implementation Disclosure of monitoring reports in ADB's website
MOH	Responsibility for overall project implementation, including environmental management activities and implementation of EARFs Coordination of environment-related activities of project implementation units including implementation of aspects of EARFs Responsibility for project operation including operation stage environmental performance Allocation of staff with responsibility for environmental issues during operation Preparation of monitoring reports on EMP implementation and submission to ADB
PIU/PDOH/Hospital	Responsibility for province level project implementation Responsibility for implementing EARFs including preparation of environmental assessments - and obtaining environmental approvals for works within province Responsibility for pre-construction stage and construction stage environmental management, monitoring and reporting
MOE	Provision of advice to PIUs as required on environmental issues
MOE and ADB	Approval of EMPs for works within districts
Suppliers/ contractors	Implementation of environmental management commitments contained in site specific EMPs Monitoring and reporting of environmental performance

ADB = Asian Development Bank, EARF = environmental assessment and review framework, EMP = environmental management plan, MOE = Ministry of Environment, MOH = Ministry of Health, PIU = project implementing units, SEMP = site-specific environmental management plan.
Source: Asian Development Bank.

118. Responsible personnel assigned by the MOH would have primary responsibility for environmental issues and activities during project implementation.

B. Environmental Management Plan

119. Table 5 contains the proposed typical environmental management plan (EMP) for the pre-construction, construction and operations stages of selected project sub-components as assessed. During project implementation, the EA, through the project management unit and national consultants validate the EMPs for the site specific project sub-components as a continuing process. When relevant, EMPs will be included in the bid and contract documents. Reference will be made to new site information obtained to update site specific mitigation measures for inclusion in the EMP. The following table-5 is the Environmental Management Plan:

Table 5: Environmental Management Plan (EMP)

Issue	Performance Objective	Mitigation Measure	Responsibility for Implementation	Estimated Costs
Pre-Construction				
Permits/Environmental approvals for contractor	Minimize construction waste, alternative solution	Request for obtaining an agreement for disposal of construction waste and discussion with hospital management. Contractor employ waste collection firm in the provinces/districts	Awarded contractor responsibility /hospital management	Included in the project cost/procurement budget
EMP in Bidding Documents	Positive environmental impact	Ensure that the EMP is attached to bidding documents	EA/MOH/consultant management team	
Assignment of Safeguard staff	Positive environmental impact	Ensure that each hospital has IPC focal point	IPC focal point assigned to be responsible for implementing the EMP	

Issue	Performance Objective	Mitigation Measure	Responsibility for Implementation	Estimated Costs
Development of Environmental health and safety guideline		The contractor is required - Contractor to designate an Environmental Health and Safety officer to implement and monitor CEMP and health and safety guidelines. - To orient/train workers regularly to ensure they know CEMP and health and safety requirements. Training will be conducted by responsible person who are working on Environment, Health and Safety.	Contractor	Included in project contract
Construction support Preparation	Environmental Education awareness Complaints procedures established Construction Environmental Management Plan (CEMP)	- Environmental Protection Training: PIC Environment Consultant and/or PMU environment officer will be invited to provide on-the-job training on implementation & supervision of environmental mitigation measures to PMU, PIU and contractors. - The Project Grievance Redress Mechanism will be established and contact persons for the sub-project provided to affected persons and included on sign boards at construction sites, camps and each village. - Prepare a construction environmental management plan, including an emergency preparedness and response guideline for construction emergencies and site health and safety guidelines	- EA's Environment Consultant - EA's Environment Consultant & PMU - Contractor	Included in the project cost/consultant
COSNTRUCTION PHASE				
Dust and emissions generation	Minimize emissions of dust and other pollutants	Use wet rags and vacuum cleaners for dust suppression Contain and minimize of work areas	Supplier/ contractor	Included in hospital and laboratories recurrent budget. Provided by

Issue	Performance Objective	MitigationMeasure	Responsibility for Implementation	Estimated Costs
		Ensure construction equipment and vehicles are maintained in good condition Utilize temporary protective curtains on existing facilities and equipment Emissions from the labs will be collected and treated to ensure the compliance with relevant environmental standards		supplier/ contractor
Noise generation	Minimize noise generation	Proper maintenance of tools and equipment Limit noisy construction activities to day time hours 7am-5pm Install noise dampers Notify affected rooms of schedule and duration Ensure noise levels are within stipulated (national) requirements for health centers	Supplier/ contractor	Provided by supplier/ contractor
Surface water and groundwater quality	Minimize generation of potential water pollutants	Store chemicals in secure area, with concrete floor and weatherproof roof Prepare temporary drain containment or basins Keep left-over scrap materials in locations removed from the drainage ways Use prescribed O&M standards for the labs	Supplier/ contractor	Provided by supplier / contractor
Soil contamination	Avoid adverse impacts from disturbed soils	Installing equipment and minor reparations will not create soil contamination. In any case the supplier and contractor will ensure that an impermeable barrier between the working surfaces and the soil are used	Supplier/ contractor	Provided by supplier / contractor

Issue	Performance Objective	Mitigation Measure	Responsibility for Implementation	Estimated Costs
		to avoid contamination during the works. The solid and liquid waste will be managed, stored and disposed of according to the relevant national guidelines		
Risks to public and worker health and safety	Minimize risk of accidents to public and workers	Adopt and ensure that the hospitals health and safety guidelines are established and practiced Wear and be trained on personal safety equipment Appropriate first aid measures are available on site and emergency contact numbers are clearly displayed on sites including emergency evaluation procedures and maps	Supplier/ contractor	MOH recurrent budget
Increase in illness due to environmental pollution	Avoid illness from environmental pollution	Adopt and ensure that the hospitals health and safety guidelines are established and practiced	MOH	MOH recurrent budget
Accidents and Injury	Avoid accidents and injury	Adopt and ensure that the hospitals health and safety guidelines are established and practiced	MOH	MOH recurrent budget
Access roads to construction site. Site hand over/ clearance to pre-project	Positive impact Positive impact	Adopt and alternative access road away from patients and ambulance access road, hauling construction material during low traffic time Adopt and ensure that the complete construction site to pre-project status	Awarded contractor/ IPC focal point Awarded contractor/ IPC focal point	Included in the project cost/procurement budget
Operations Stage				

Issue	Performance Objective	Mitigation Measure	Responsibility for Implementation	Estimated Costs
Dust and emissions generation	Minimize emissions of dust and other pollutants	Ensure compliance with relevant Cambodia air quality emissions standards Non-incinerator technology should be considered for medical solid waste management facilities (if any) to ensure compliance with relevant the environmental standards of Cambodia on air quality, particulates and odor	MOH and MOE	MOH recurrent budget
Odor generation	Minimize odor generation	Develop and implement guidance and action for operation of the labs and training of personnel in proper operation of the labs Regularly remove of waste from temporary storage areas and train personnel in proper waste management practices.	MOH	MOH recurrent budget
Noise generation	Minimize noise generation	Ensure solid waste equipment and vehicles are maintained in good condition Install noise dampers or erect temporary acoustic shields Limit noisy operational activities to day time hours Notify nearby community of schedule and duration of activities	MOH	MOH recurrent budget
Surface water and groundwater quality	Minimize generation of potential water pollutants and maintain water quality	Store chemicals in secure area, with concrete floor and weatherproof roof Prepare temporary drain containment or basins and impermeable lining for medical refuse burial pits. Keep left-over scrap materials in locations removed from the drainage ways	MOH and MOE	MOH recurrent budget

Issue	Performance Objective	MitigationMeasure	Responsibility for Implementation	Estimated Costs
		Use prescribed O&M standards for the labs Maintain storage areas and provide bins for solid waste collection and prevent leaching Train solid waste collectors and hospital staff in proper health care waste management to protect waterways. Ensure that discharge from solid waste and wastewater treatment facilities will comply with criteria contained in the applicable Cambodia and MOE regulations. Ensure that wastewater from the laboratories will be conveyed directly to a wastewater treatment facility or in it is absence, will be collected, stored and treated/disposed of by a licensed waste management contractor		
Soil contamination	Avoid adverse impacts from disturbed soils	Ensure sealing and containment of burial pits or dumping grounds prior to external municipal disposal. Ensure that discharge from solid waste facilities will comply with criteria contained in the applicable Cambodia and MOE regulations. Improve operations of wastewater disposal facilities with discharge that complies with the current applicable MOE standards for medical wastewater.	MOE	MOH recurrent budget
Risks to public and worker health & safety	Minimize risk of accidents involving public or health care workers	Implement safety measures during removal and disturbance of asbestos, if any.	MOH and MOE	MOH recurrent budget

Issue	Performance Objective	MitigationMeasure	Responsibility for Implementation	Estimated Costs
	Maximize benefits of project operation	Provide safety equipment to construction workers and train them in its use Emergency evacuation procedures to be clearly signposted at appropriate locations. Secure SWM landfill site and restrict access by local community Ensure that the applicable Cambodia regulations on SWM and wastewater discharge are complied with.		
Emissions generation	Comply with relevant Cambodia Emission standards	Ensure emissions from incinerator operation comply with relevant standards	MOH and MOE	MOH recurrent budget
Odor generation	Maximize benefits of project operation	Develop operating procedures for health care waste management systems, if any Train personnel in implementation of operating procedures	MOH	MOH recurrent budget
Surface water and groundwater quality	Maximize benefits of project operations	Incorporate lining systems in landfill facilities Ensure effluent from wastewater and solid waste facilities complies with relevant Cambodia standards prior to discharge Develop operating procedures for health care waste management systems and wastewater treatment facilities, if any Undertake regular maintenance of solid waste and wastewater treatment facilities, if any Train personnel in implementation of operating	MOH and MOE	MOH recurrent budget

Issue	Performance Objective	MitigationMeasure	Responsibility for Implementation	Estimated Costs
		procedures		
Risks to public & worker health and safety	Maximize benefits of project operation	Secure solid waste and wastewater treatment facilities to avoid public access to facilities Develop operating procedures for health care waste management systems and wastewater treatment Undertake regular maintenance of solid waste and wastewater treatment facilities Train personnel in implementation of operating procedures	MOH	MOH recurrent budget
Increase in illness due to environment al pollution.	Avoid illness from environment al pollution	Ensure that the hospitals health and safety national guidelines are established and practiced Sustain pollution control measures in operations to avoid/reduce noise, dust, and air emissions Ensure that all national environmental pollution measures on wastewater and surface water runoff, and soil contamination management are in place	MOH	MOH recurrent budget
Accidents and Injury	Avoid and prevent accidents and injuries	. Ensure that the applicable laws and regulations on SWM and wastewater treatment particularly on best practices and safety are complied with.	MOH	MOH recurrent budget
		Develop operating procedures for health care waste management systems and wastewater treatment facilities Undertake regular maintenance of solid waste and wastewater treatment facilities Train personnel in implementation of operating	MOH	MOH recurrent budget

Issue	Performance Objective	MitigationMeasure	Responsibility for Implementation	Estimated Costs
		procedures including first aid and emergency procedures		
COVID-19	Prevention of COVID-19	Follow and implementing MOH guideline and WHO public health and social measures in the workplace in the context of COVID-19 (issued 10 May 2020)	MOH/Contractor/ Workers	Included in the project cost/procurement budget

MOE = Ministry of Environment, MOH = Ministry of Health, SWM = solid waste management. Source: Asian Development Bank

C. Environmental Monitoring Plan

120. Tables 6 and 7 contains the proposed environmental monitoring plan for the pre-construction, construction and operations stages of the project components. Two types of environmental monitoring are proposed to be implemented:

(i) Environmental effects monitoring is conducted to estimate the impacts of the sub-project on ambient environmental conditions.
(ii) Project environmental performance monitoring is conducted to evaluate compliance with environment-related operating procedures, national standards, and/or supplier's specifications including the requirements of the EMP.

(iii) The following plan identifies the relevant site specific monitoring measures for inclusion in the EMP.

Table 6: Environmental Effects Monitoring Plan

Mitigation Measure	Parameters	Location	Methods	Frequency	Responsibility
Pre-Construction					
No monitoring required In each hospital, the existing healthcare waste has to incinerate within hospitals, waste water/liquid has diluted with bio-safety and discharged in cesspits. Some hospitals have their own settling ponds. The IPC focal points had been assigning to deal with IPC aspects and environment. The awarded contractors need to have their own designated dumping site for construction waste. The minor repair for laboratory facility included the refurbishment/equipped with air conditioners, wall partitions, repainting wall… etc. Minor debris waste need to dump at hospital site e.g. Pon Nhea Krek hospital.					
Construction stage					
Dust suppression	Visible dust	In the laboratory and adjoining rooms Site of new building	Monitoring/ Visual observation	During windy conditions	Contractor, consult with IPC
Noise minimization	Noise levels near sensitive receivers (earnest patient rooms)	In the laboratory and adjoining rooms	Monitoring the implementation [indoor ward room dB(A)=30]	During noisy activities	Contractor, consult with IPC and hospital

Water quality protection	Visible sediment, waste or other pollutants in waterways	At surface waterways and wells in vicinity of the hospitals (e.g. Pea Reang hospital)	Monitor the implementation /Observation	Weekly or after rain events	Contractor, consult with IPC and MOE
Operations					
Biological samples in the laboratories	Adherence to national guidelines for handling, storage and disposal,	Ambient conditions at site and around	Observation	Weekly for first 6 months and then monthly thereafter	MOE
Water quality protection	Visible sediment, waste or other pollutants in waterways	In waterways and wells in vicinity of effluent discharge from solid waste or wastewater facilities	As specified in Cambodia standards	Weekly for first 6 months and then monthly thereafter	MOE
Prevention of COVID-19	Temperature check and testing (if any)	Civil work implementation of 27 hospitals	-Hand hygiene -Respiratory hygiene -Physical distancing	Every working day at site	MOH/Contractor / Workers

MOE = Ministry of Environment, MOH = Ministry of Health, SWM = solid waste management. Source: Asian Development Bank.

Table 7: Environmental Performance Monitoring Plan

Mitigation Measure	Parameters	Location	Methods	Frequency	Responsibility
Pre-Construction					
Monitoring required					
Procurement					
Dust suppression	Covering of equipment and fixtures and use of dust suppression methods	In the laboratory and adjoining rooms	Visual observation	During windy conditions	Supplier / MOE
Water quality protection	Condition of erosion and sediment controls	At surface waterways and wells in vicinity of hospitals	Observation	Weekly or after rain events	Supplier / MOE
Operations					
Air emissions control	All criteria in Cambodia - Air quality odor from solid waste matter - Permitted level.	At solid waste facilities and autoclaves (both existing one and the project-IPC re-supply the autoclave-)	As specified in Cambodia standards	Weekly for first 6 months and then monthly thereafter	MOE
Water quality protection	Visible sediment, waste or other pollutants in waterways	At effluent discharge from solid waste or wastewater facilities	As specified Cambodia standards	Weekly for first 6 months and then monthly thereafter	MOH
Prevention of COVID-19	Temperature check and testing (if any)	Civil work implementation of 27 hospitals	-Hand hygiene -Respiratory hygiene -Physical distancing	Every working day at site	MOH/Contractor / Workers

MOE = Ministry of Environment, MOH = Ministry of Health, SWM = solid waste management. Source: Asian Development Bank.

D. Environmental Monitoring and Reporting

121. Table 8 contains the proposed environmental monitoring and reporting system for the pre-construction, construction and operation stages of the project. The safeguards monitoring report (social and environmental) has been prepared as annually report to ADB/CARM (loan covenant and PAM).

Table 8: Environmental and Monitoring Reporting Requirements, annually to ADB

Project Phase	Type of Monitoring	Description	Responsibility	Frequency	Reporting Requirements
construction	Supplier/ Contractor's Environmental Performance Monitoring	Self-monitoring of environmental effects of minor repair and improvement works in terms of environmental performance monitoring requirements identified in EMP. Undertaken on an ongoing basis throughout the construction?? process with regular	Supplier/ contractor-weekly report to MOH	Annually report to ADB	Commissioning reports to MOH/MOE
	EMP Compliance Monitoring	Monitoring of Supplier/Contractor's compliance with EMP requirements. Undertaken during Construction?. Monitoring based on combination of observation and review of supplier's environmental performance monitoring results.	Provincial Implementing Agency (PIAs)	Annua lly report to ADB	Commissionin g reports to MOH/ ADB
Operations	Operation Environmental Monitoring	Monitoring of performance of project operation. Undertaken on a regular basis over life of project and self-reporting of compliance with EMP operation stage commitments.	MOH	Annually report to ADB	Commissioning reports to MOH/ ADB
COVID-19	Operation Environmental Monitoring	Includes COVID-19 in reports	MOH/GMS-HSP	Annually and quarterly	Commissioning reports to MOH/ ADB

ADB = Asian Development Bank, EMP = environmental management plan, MOE = Ministry of Environment, MOH = Ministry of Health, PIA = provincial implementing agency.

Source: Asian Development Bank.

E. Environmental Management Budget

122. Environmental management and capacity building/orientation costs include costs both at the level of individual project sub-components as well as project component-wide environmental management costs. An environmental management and capacity building/orientation budget to cover costs for management and monitoring both at the level of the district hospitals and provincial

hospitals will be established and included in the province annual operations plan and budget, to be funded by the project. A certain percentage of the total project costs can be allocated for this fund upon agreement with the MOH.

8. The EMP budget will include the following components:

(i) Marginal costs for implementation of environmental mitigation measures during pre-procurement, procurement and operations stages.
(ii) Marginal costs for implementation of environmental monitoring measures during pre-procurement, procurement and operation stages.

VII. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

A. Public Consultation Undertake

123. The public consultations were undertaken during June 2019 in 27 target hospitals. Total 194 participants have attended the consultations, included 48 is female participants. The consultations included the following:

(i) Meetings and consultations with hospital management-directors, staff laboratory and infection control and prevention staff to inform them about the need for rapid environmental assessments and obtain the current status of the district hospital facilities and health centers and the upgrades or improvements that they are proposing based on their own diagnosis.
(ii) Meetings and consultations with the District Health Office Director and/or Hospital Director together with their management and staff, laboratory and infection control and prevention staff representatives in the sampled project province to brief them about the environmental assessments that each hospital has to undertake to identify the current status of environmental conditions in the vicinity of the health facilities and identify the scope of required project interventions.

124. The public consultations showed a high level of acceptance of the project as the project will improve the hospitals' and health centers' current state and capability for improved laboratory services and infection prevention and control. Some suggestions were forwarded regarding the laboratory equipment needed, waste management containers, disposal technologies that are non-burn. Representatives of international non-government organizations were concerned about the health effects of incinerators. Some of the related environmental concerns included the lack of proper management of health care waste, the lack of adequate staff for operations and maintenance of the facilities, and the basic lack of medical and non- medical equipment. Such concerns will be incorporated in the mitigation and monitoring plans during project design and implementation. The project management and MOH has proposed installations and operations of microwave-based healthcare waste management in 27 hospitals since healthcare waste managements in hospitals faced difficulties with the obsolete/old incinerator operations. Public consultation is an on-going process and the consultations will continue with the project affected communities and relevant non-government organizations, if any, during the implementation phases of the project. The IEE will be disclosed on the ADB website before the ADB Board circulation.

B. Future Public Consultation and Disclosure

125. In order to ensure that future project activities are conducted in a participatory sense and that community concerns and opinions about potential environmental impacts are taken into account during subcomponents of procurement and operations, a range of public consultation and disclosure activities will be implemented throughout activity preparation, implementation and operations. These activities, which have been developed to meet the requirements of both Government of Cambodia and ADB safeguards requirements, are summarized in the following

sections.

126. The following consultation activities will be implemented during the first year of the implementation of the project activities:

(i) District level workshops in each district contained in the project area to discuss project interventions, potential environmental impacts of project activities and required mitigation measures. Representatives at the workshops will include stakeholder agencies, mass organizations (Women's' Union, Youth Union and Farmers Association), other relevant district level organizations such as the District Committee for Ethnic Minorities, Commune People's Committee and other relevant stakeholder representatives.
(ii) Meetings with potentially affected households, sensitive receivers (schools, temples etc.) and landowners to discuss specific issues of concern and mitigation measures required particularly for the quarantine and border area outbreak response facilities.

127. The public consultation activities carried out and the subsequent outcomes will be documented in the environmental assessment documents to be prepared for each site and records of the public consultation appended to the document as outlined in the Environmental Assessment and Review Framework for the project.

128. To ensure ongoing community involvement during project procurement and operations, the following activities will be carried out for each project activity.

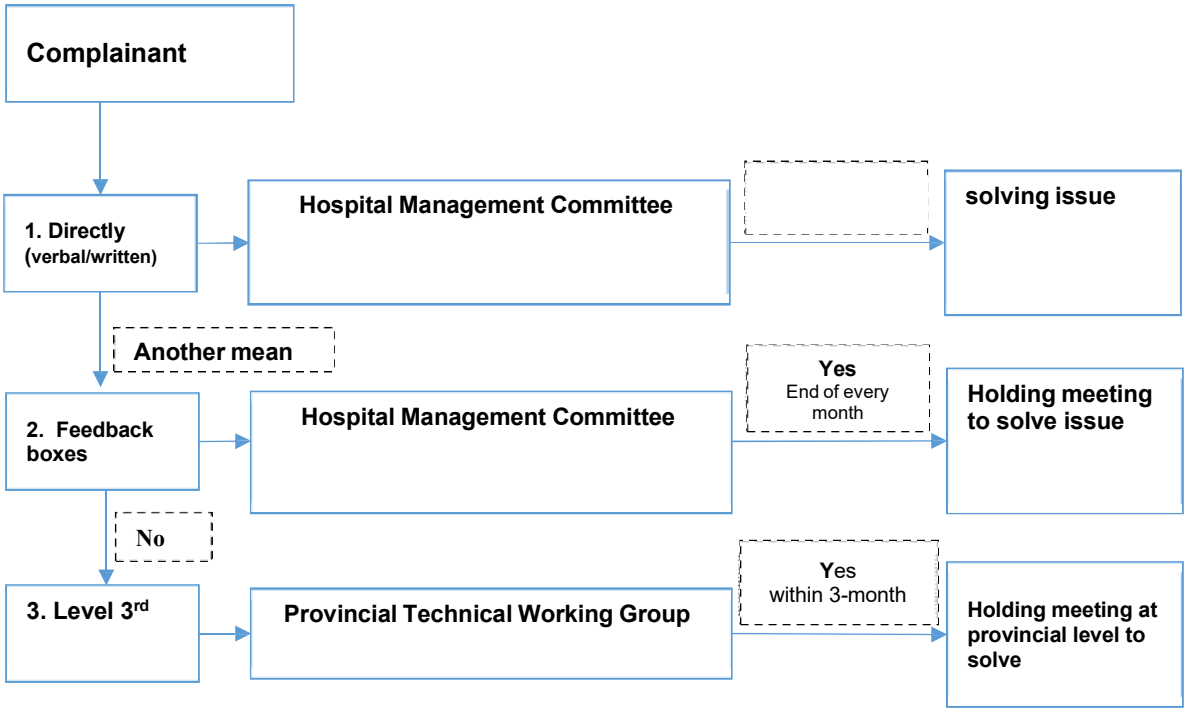
(i) Community information on procurement and operational activities and details of any expected impacts and measures to control them by means of newspaper and loudspeaker announcements and direct communication by local authorities to affected households
(ii) Establishment of a grievance redress mechanism to allow community members to report concerns regarding operational activities including environmental pollution concerns. Such mechanisms will be published in the health facilities premises and included in the project website.

129. The requirements for future consultation activities during procurement and operation will be documented in the site specific environmental assessments to be prepared during project implementation. Results of public consultations during operation phase will be reported in the environmental monitoring reports and submitted for disclosure in ADB's web site.

C. GRIEVANCE REDRESS MECHANISM

130. Grievance redress mechanisms were established in each hospital. If any affected person (AP) wished to express her/his concerns about the civil works implementation of minor repair/refurbishment of laboratory facilities and microwave-based waste management installation, they will advise to: (1). **The hospital management committee** (consisted of hospital director, deputy director, chief of services and chief of wards): The complainant could express her/his concerns by submitting the letter of complaint to the hospital committee then the hospital management committee has to deal with issues immediately. Another way, the complainant can use feedback boxes attached in each hospital building, the hospital management committee has checked the feedback boxes at the end of every month and conducting the meeting among their members to cope with the issue. (2). **Provincial Technical Working Group** (consisted of representatives from provincial department of health, provincial hospital management, operational districts referral hospital, district hospitals and NGOs related health). The complaint can be dealing with and decision at this stage. The Provincial Technical Working Group holds its meeting every 3-month period and shall implement the decision.

Figure 1: Existing Grievance Redress Mechanism in Hospitals



And another proposed procedure and timeframe via local authorities for the grievance redress mechanism to complement the existing mechanism (if any) as follow:

Stage 1: Contractor or village/commune-Sangkat leaders at Commune/Sangkat Level (5 working days). Affected People (APs) present their complaints and grievances verbally or written to the contractor/village or commune-Sangkat leaders. If after 5 days the aggrieved AP does not hear/resolve from taken in the first step, the complaint may be brought to the District/Municipal Office/PIU at district/municipal level.

Stage 2: District/PIU at district/municipal level (5 working days). This level has 5 working days within which to resolve the complaint to the satisfaction of all concerned. If the complaint is not solved at this stage, the District/municipal level will bring the case to the PMU at national level.

Stage 3: PMU at national Level (10 working days). This level has 10 working days within which meets with the aggrieved party and tries to resolve the situation. Within 10 working days of submission of the grievance, the PMU must make a written decision and submit copies to the Department of Hospital/MOH and the APs. If the complaint still not be solved at this stage, the complaint may be brought to ADB/CARM.

VIII. FINDINGS AND RECOMMENDATIONS

A. Findings

131. The civil works under the project/program includes minor repair/renovation and refurbishment of existing laboratory facilities, and construction of small shelter for microwave-based waste management (integrated biomedical waste treatment and disposal) within hospitals' campuses and away from patient's wards. The designated area for building 7 meters by 7 meters, this is a maximum size of building 'roof, but the building size is just 5 meters by 5 meters.

132. The environmental impacts will be anticipated negligible negative impacts such as dust, noise, and solid waste. There is no protected area, an area of ecological interest or environmental

sensitive area, cultural, historical and archeological area within hospitals' campuses/premises.

133. Good cooperation between all stakeholders, especially hospitals managements and awarded contractors should be undertaken, therefore, the implementers can update concerns and issues during civil works implementation.

134. The negative impacts expected to occur during operation stages of the project, namely:

(i) **During the procurement/construction stage**: Probably some structures of the laboratories and/or other structures of the hospitals need to be repaired and upgraded before assembly of the equipment. However, the negative impacts during this phase will be negligible due to the scale of the activities are limited and these negative impacts will be localized and temporary. Such impacts include generation of noise and dust, deterioration of water quality through sediment laden runoff and will be readily managed to acceptable levels through implementation of standard environmental management practices.

(ii) **During operation stage**: Liquid and solid waste generated by the operation of the laboratories as well as the hospitals as a whole are likely to be the sources of negative impacts on the environment if they are not managed properly. Such pollution sources will include infectious specimens, chemicals for testing, wastewater and emission of the laboratories. These pollution sources are long- term and consecutive, and therefore, mitigation measures should be considered adequately through both structural measures (the technical systems for collection and treatment the wastewater, hazardous waste, infectious waste and emission generate from the laboratory should be equipped synchronously) and management measures (application procedure of separation of wastes at source, procedure of management, collection and treatment of hazardous/infectious wastes, etc.). During the Operations stage environmental impacts can be mitigated to acceptable levels through appropriate design of subprojects and implementation of basic operations and maintenance (O&M) environmental management practices particularly in relation to solid waste and wastewater treatment facilities.

B. Recommendations

135. The environmental mitigation measures and environmental monitoring plan, as presented in the updated IEE and EMP or environmental code of conduct attaching to the bidding documents must be implemented, including Occupational Health and Safety and Community, Health and Safety. It is recommended that the Project should ensure that for the selected health facilities the laboratories should be well-managed with trained staff. Based on the field assessment and the project proposals, most of laboratories have standardized biosafety level 3[3] for the provincial health facilities (provincial hospitals) and standardized biosafety level 2[4] for the district health facilities (district hospitals and selected health centers), as per WHO standards.

136. Separately, the project will undergo environmental impact assessment in accordance with Cambodia's laws on environmental impact assessment. The Environmental Impact Assessment is required for all newly improved hospital projects. For the repair, renovation and upgrade of the hospitals, depending on the scale of the construction activities, an EIA or Environmental Protection Scheme have to be prepared in the next phase of the project in accordance with Government of Cambodia's regulations.

[3] Biosafety Level 3 is applicable to clinical, diagnostic, teaching, research, or production facilities where work is performed with indigenous or exotic agents that may cause serious or potentially lethal disease through the inhalation route of exposure. WHO. 2004. *Laboratory Biosafety Manual. Third edition.* Geneva

[4] BIOSAFETY LEVEL 2. (BSL-2) practices and procedures are suitable for work involving agents of moderate potential risk to personnel and the environment. These agents can cause disease in healthy individuals and pose a moderate risk to the environment. WHO. 2004. *Laboratory Biosafety Manual. Third edition.* Geneva

IX. CONCLUSIONS

137. Results of the initial environment examination indicated that the construction of a building (7mx7m) for integrated biomedical waste treatment and disposal and minor repair of existing laboratory facilities in targeted 27 hospitals will not result to significant adverse environmental impacts. The anticipated impacts during the construction of integrated biomedical waste treatment and disposal can be easily mitigated with the code of conduct and/or implementation of EMP and Environmental Monitoring Plan.

138. There is no protected area, area of ecological interest or environmental sensitive area, cultural, historical and archeological area within the 27 hospitals.

139. These will be localized, minor and temporary and will be readily managed to acceptable levels through the implementation of the appropriate solid waste, wastewater, and environmental management practices. Operations stage environmental impacts can be mitigated to acceptable levels through appropriate design of subprojects and implementation of basic operations and maintenance (O&M) environmental management practices.

140. This updated IEE Report includes an EMP defining the types of environmental mitigation and monitoring measures required to offset potential negative environmental impacts. The development of the EMP takes into account the likely level of technical, financial and human resources available for each of the subproject components. The EMPs has been updated as project implementation progresses beginning with the detailed design. COVID-19 prevention has included in the civil work implementation of 27 hospitals.

141. The investments in the health security project, overall, will bring forth more positive than negative environmental impacts and greater health security particularly in the border provinces. Overall the project should bring improved healthcare waste management and this will mean a reduced risk of environmental pollution and health impacts to staff and people living near the hospital environment.

X. REFERENCES

ADB. 2009. *Safeguard Policy Statement.* Manila.

Appendix 1: Environmental Screening of Project Sub-Components

Note: The following key is used:

NO impact	O
MINOR NEGATIVE impact	X
MAJOR NEGATIVE impact	XX
MINOR POSITIVE impact	+
MAJOR POSITIVE impact	++
UNKNOWN impact	?

POTENTIAL IMPACT	PRE-PROCUREMENT STAGE	PROCUREMENT STAGE	OPERATION STAGE	DISCUSSION OF IMPACT AND MITIGATION MEASURES
Impacts on the Natural Environment				
Dust generation and air emissions	O	X	O	Minor Repair and construction of small shelter for microwave-based waste management During minor repair and construction of a building for microwave-based waste management, localized, temporary negative impacts may result from dust generation from removal and installation of existing equipment, frames, cabinets, and supports to clear the way for new laboratory improvements and equipment. Mitigation measures will include use of wet rags and vacuum cleaners for dust suppression, containment and minimization of work areas, and utilizing temporary protective curtains on existing facilities and equipment. No impacts are expected during the operation stage.
	O	X	++	Laboratory Equipment Commissioning including IPC Services Negative Impact as above for dust emissions. As a mitigating and control measure, emissions from the labs will be collected and treated to ensure the compliance with relevant the environmental standards of Cambodia as current regulations on air (poison gases and odor) IPC “standard precautions” to be implemented to enhance positive impact during operations.

POTENTIAL IMPACT	PRE-PROCUREMENT STAGE	PROCUREMENT STAGE	OPERATION STAGE	DISCUSSION OF IMPACT AND MITIGATION MEASURES
	O	O	X	Solid Waste Management Facilities Negative impact as above for dust emissions. For IPC, autoclaves will be designed and controlled to ensure compliance with relevant Cambodia air quality emissions standards namely criteria contained in MOE regulations on: air (odor and particulates) and water quality – for steam condensate of medical liquid waste from autoclaves permitted level. Non-incinerator technology should be considered for medical solid waste management facilities (if any) to ensure compliance with relevant the environmental standards of Cambodia on air quality, particulates and odor. Wastewater Treatment Facilities??
Odor generation	O	O	O	Minor Repair and construction of building for microwave-based waste management No impact
	O	O	X	Laboratory Equipment Commissioning including IPC Services During operation improper use or maintenance of lab facilities and equipment may result in minor, localized impacts from odor generation. Mitigation measures will include development and implementation of guidance and action for operation of the labs and training of personnel in proper operation of the labs and microwave-based waste management.
	O	O	X	Solid Waste Management Facilities During operation improper use or maintenance of waste storage areas may result in minor, localized impacts from odor generation. Mitigation measures will include development of operational procedures for temporary and permanent waste storage areas, regular removal of waste from temporary storage areas and training of personnel in proper waste management practices.

POTENTIAL IMPACT	PRE-PROCUREMENT STAGE	PROCUREMENT STAGE	OPERATION STAGE	DISCUSSION OF IMPACT AND MITIGATION MEASURES
	O	O	X	Wastewater Treatment Facilities During operation improper use or maintenance of wastewater treatment facilities may result in minor, localized impacts from odor generation. Mitigation measures will include development of appropriate operational procedures and training for personnel.
Noise generation	O	X	O	Minor Repair and construction of small shelter for microwave-based waste management During minor repair and improvement work, minor, localized, temporary impacts may result from noise generation from use of tools and installation equipment. Mitigation measures will include restriction of noisy activities to day time hours, installation of noise dampers, proper maintenance of tools and equipment, erection of temporary acoustic shields in the vicinity of sensitive receivers and notification of the affected rooms of the duration and extent of installation works. No impacts are expected during the operation phase of the works.
	O	X	O	Laboratory Equipment Commissioning including IPC Services Minor negative impacts and mitigating measures as above.
	O	O	X	Solid Waste Management Facilities During collection, transport and disposal operations, minor, localized, temporary impacts may result from noise generation from use of containers, vehicles and equipment. Mitigation measures will include restriction of noisy activities to day time hours, installation of noise dampers, proper maintenance of equipment, erection of temporary acoustic shields in the vicinity of sensitive receivers and notification of the affected areas of the duration medical waste management activities.
	O	O	X	Wastewater Treatment Facilities Minor negative impacts and mitigating measures during operations as above

POTENTIAL IMPACT	PRE-PROCUREMENT STAGE	PROCUREMENT STAGE	OPERATION STAGE	DISCUSSION OF IMPACT AND MITIGATION MEASURES
Surface water quality deterioration	O	X	0	Minor Repair and construction of small building for microwave-based waste management Minor negative impacts on surface water quality as a result of dirt and sediment laden drainage water from cleaning during preparation for lab equipment installation. This may include cleaning chemicals, fuels or oils used and disposal of litter and general solid waste. Mitigation measures will include preparation of temporary drain containment or basins, and keeping left-over scrap materials in locations removed from the drainage ways.
	O	X	X	Laboratory Equipment Commissioning including IPC Services Minor negative impact and mitigating measures same as above during procurement stage. During operation stage, surface water quality may be adversely affected as a result of spills or leakage of chemicals generated from the laboratory activities including bio-wastes and laundry water emissions. Mitigation measures will include development and operation of the O&M for the labs. Wastewater from the labs will be collected and treated to ensure compliance with the current standards for the medical wastewater
	O	O	X	Solid Waste Management Facilities During operation stage, surface water quality could be adversely affected by improper disposal of solid waste Mitigation measures will include maintenance of storage areas and provision of bins for solid waste collection and training of solid waste collectors and hospital staff in proper health care waste management to protect waterways. Discharge from solid waste facilities will comply with criteria contained in the applicable Cambodia MOE and MOH regulations.

POTENTIAL IMPACT	PRE-PROCUREMENT STAGE	PROCUREMENT STAGE	OPERATION STAGE	DISCUSSION OF IMPACT AND MITIGATION MEASURES
	O	O	X	Wastewater Treatment Facilities Negative impacts during operations of sub-standard wastewater facilities in existing provincial and district hospitals. Mitigating measures will include the proper design and improvement in operations of wastewater disposal facilities with discharge that complies with the criteria contained in the current applicable MOE standards for medical wastewater.
Ground water quality deterioration	O	X	O	Minor Repair and construction of small shelter for microwave-based waste management Minor negative impacts on ground water quality as a result of dirt and sediment laden drainage water from cleaning during preparation for lab equipment installation that will seep through ground water sources or wells. This may include cleaning chemicals, fuels or oils used and disposal of litter and general solid waste. Mitigation measures will include preparation of temporary drain containment or basins, and keeping left-over scrap
	O	X	X	Laboratory Equipment Commissioning including IPC Services Minor negative impact and mitigating measures same as above during procurement stage. During operation stage, ground water quality may be adversely affected as a result of spills or leakage of chemicals generated from the laboratory activities including bio-wastes and laundry water emissions. Mitigation measures will include protecting groundwater sources permanently and the development and operation of the O&M for the labs. Wastewater from the labs will be collected and treated to ensure compliance with the current standards for the medical wastewater before discharging to the environment.
				Solid Waste Management Facilities

POTENTIAL IMPACT	PRE-PROCUREMENT STAGE	PROCUREMENT STAGE	OPERATION STAGE	DISCUSSION OF IMPACT AND MITIGATION MEASURES
	O	O	X	During operation stage, ground water quality could be adversely affected by improper disposal of solid waste. Mitigation measures will include maintenance of storage areas and provision of bins for solid waste collection and training of solid waste collectors and hospital staff in proper health care waste management to protect ground water sources. Discharge from solid waste facilities will comply with criteria contained in the applicable Cambodia MOH and MOE regulations.
	O	O	X	Wastewater Treatment Facilities Negative impacts during operations of sub-standard wastewater facilities in existing provincial and district hospitals with emissions that could affect ground water quality. Mitigating measures will include the proper design and improvement in operations of wastewater disposal facilities with discharge that complies with the criteria contained in the current applicable MOE standards for medical wastewater.
Soil Contamination	O	X	O	Minor Repair and construction of small shelter for microwave-based waste management During operation, minor impacts of cleaning activities resulting in contamination of soils with cleaning chemicals and agents from repair and improvement activities. Mitigation measures will include ensuring that a barrier between the working surfaces and the soil are used to avoid contamination during the works.
	O	O	O	Laboratory Equipment Commissioning including IPC Services No impacts.

POTENTIAL IMPACT	PRE-PROCUREMENT STAGE	PROCUREMENT STAGE	OPERATION STAGE	DISCUSSION OF IMPACT AND MITIGATION MEASURES
	O	O	X	Solid Waste Management Facilities During operation stage, soil could be adversely affected by improper disposal of solid waste particularly for hospitals that bury medical wastes into their own grounds. Mitigation measures will include ensuring sealing and containment of burial pits or dumping grounds prior to external municipal disposal Discharge from solid waste facilities will comply with criteria contained in the applicable Cambodia and MOE regulations.
	O	O	X	Wastewater Treatment Facilities Negative impacts during operations of sub-standard wastewater facilities in existing provincial and district hospitals with emissions that could affect surrounding soils. Mitigating measures will include the proper design and improvement in operations of wastewater disposal facilities with discharge that complies with the criteria contained in the current applicable MOE standards for medical wastewater.
Impacts on the socio-economic environment				
Amenity of surrounding land use	O	X	O	Minor repair and construction of building for microwave-based waste management During procurement very minor, localized and temporary impacts to amenity of surrounding land use may occur in the form of dust and noise generation. Such impacts will be readily mitigated through the range of measures previously described on dust, odor and noise.
	O	X	O	Laboratory Equipment Commissioning including IPC Services Same as above during procurement, the laboratories may generate small amounts of odor; any such impacts will be minor, temporary and localized.

POTENTIAL IMPACT	PRE-PROCUREMENT STAGE	PROCUREMENT STAGE	OPERATION STAGE	DISCUSSION OF IMPACT AND MITIGATION MEASURES
	O	O	X	Solid Waste Management Facilities As above during operations. During operation the facilities may generate small amounts of odor; any such impacts will be minor, temporary and localized.
	O	O	X	Wastewater Treatment Facilities as above during operations. During operation the facilities may generate small
Impacts on Public Health and Safety				
Risks to public health and safety	O	X	0	Minor Repair and construction of building for microwave-based waste management Some demolition or disassembly of existing fixtures in preparation for laboratory equipment installation may cause risks in public safety for nearby receivers if not properly managed. Mitigating measures include adopting and ensuring that the suppliers comply with safety guidelines established by the provincial and district hospitals.
	O	O	++	Laboratory Equipment Commissioning including IPC Services Positive impact from improved laboratory equipment and safer laboratory diagnostic services for hospital staff and the public.
	O	O	X	Solid Waste Management Facilities
				Deficient or improperly managed solid waste facilities from storage, collection to disposal will increase the risks to public health and safety. Mitigating measures include ensuring that the applicable Cambodian regulations on SWM are complied with.

POTENTIAL IMPACT	PRE-PROCUREMENT STAGE	PROCUREMENT STAGE	OPERATION STAGE	DISCUSSION OF IMPACT AND MITIGATION MEASURES
	O	O	X	Wastewater Treatment Facilities Deficient or improperly managed wastewater facilities or the lack of it by the hospitals will increase the risks to public health and safety. Mitigating measures include ensuring that the applicable Cambodian regulations on wastewater discharge are complied with.
Risks to health and safety of workers	O	X	0	Minor Repair and construction of building for microwave-based waste management Some demolition or disassembly of existing fixtures in preparation for laboratory equipment installation may cause risks for health workers in the form of dust and noise Mitigating measures include adopting and ensuring that the hospitals health and safety guidelines are established and practiced by the provincial and district hospitals. Workers will be provided with appropriate personal safety equipment and will be trained in its use prior to commencement of work on the site.
	O	O	++	Laboratory Equipment Commissioning including IPC Services Positive impact from improved laboratory equipment and safer laboratory diagnostic services for hospital staff, the patients and the public.
Risks to health and safety of workers	O	O	x	Solid Waste Management Facilities Deficient or improperly managed solid waste facilities from storage, collection to disposal will increase the risks to the hospital workers. Mitigating measures include ensuring that the applicable Cambodia regulations on SWM are complied with.
	O	O	x	Wastewater Treatment Facilities Deficient or improperly managed wastewater facilities or the lack of it by the hospitals will increase the risks to hospital staff. Mitigating measures include ensuring that the applicable Cambodia regulations on wastewater discharge are complied with.

POTENTIAL IMPACT	PRE-PROCUREMENT STAGE	PROCUREMENT STAGE	OPERATION STAGE	DISCUSSION OF IMPACT AND MITIGATION MEASURES
	O	X	O	Minor Repair and construction of building for microwave-based waste management Some demolition or disassembly of existing fixtures in preparation for laboratory equipment installation may cause risks for health workers in the form of dust and noise Mitigating measures include adopting and ensuring that the hospitals health and safety guidelines are established and practiced by the provincial and district hospitals.
Increase in illness due to environmental pollution such as: dust, air, water supply contaminants, solid and hazardous wastes, untreated sewage surface water runoff, and wastewater	O	O	++	Laboratory Equipment Commissioning including IPC Services Positive impact from improved laboratory equipment and safer laboratory diagnostic services for hospital staff, the patients and the public.
	O	O	x	Solid Waste Management Facilities Deficient or improperly managed solid waste facilities from storage, collection to disposal will increase the risks to public health and safety. Mitigating measures include ensuring that the applicable Cambodia regulations on SWM are complied with. Also sustain pollution control measures in operations to avoid/reduce noise, dust, and air emissions. Implement solid and hazardous waste management plans. Ensure that all international and best practice environmental pollution measures on wastewater and surface water runoff, and soil contamination management are in place.
	O	O	x	Wastewater Treatment Facilities Deficient or improperly managed wastewater facilities or the lack of it by the hospitals will increase the risks to hospital staff and the public. Mitigating measures include ensuring that the applicable Cambodia regulations on wastewater discharge are complied with.

POTENTIAL IMPACT	PRE-PROCUREMENT STAGE	PROCUREMENT STAGE	OPERATION STAGE	DISCUSSION OF IMPACT AND MITIGATION MEASURES
Accidents and injury	O	X	O	Minor Repair and construction of building for microwave-based waste management Some demolition or disassembly of existing fixtures in preparation for laboratory equipment installation may cause risks for accidents and injury Mitigating measures include adopting and ensuring that the hospital's safety guidelines are established and practiced by the provincial and district hospitals. Workers will be provided with appropriate personal safety equipment and will be trained in its use prior to commencement of work on the site.
	0	0	++	Laboratory Equipment Commissioning including IPC Services Positive impact from improved laboratory equipment and safer laboratory diagnostic services for hospital staff and the public.
	O	O	x	Solid Waste Management Facilities Deficient or improperly managed solid waste facilities from storage, collection to disposal will increase the risks of accident and injury. Mitigating measures include ensuring that the applicable Cambodia regulations on SWM particularly on best practices and safety are complied with.
	O	O	x	Wastewater Treatment Facilities Deficient or improperly managed wastewater facilities or the lack of it by the hospitals will increase the risks the risks of accident and injury. Mitigating measures include ensuring that the applicable Cambodia regulations on wastewater discharge are complied with and safety practices are always observed, Appropriate first aid measures are available on site and emergency contact numbers are clearly displayed on sites including emergency evaluation procedures and maps.

Appendix 2. Rapid Environmental Assessment Form (Modified)

Instructions:

- This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB checklists and handbooks on (i) involuntary resettlement, (ii) indigenous peoples planning, (iii) poverty reduction, (iv) participation, and (v) gender and development.
- 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.

SCREENING QUESTIONS		Ye	No	REMARKS
Checklist No.:	**1-27**	**Project Title:**		**GMS-HSP**
Province:	**13**	**District/municipality:**		**27**
Commune/Sangkat :	**27**	**Village:**		**27**
Technical drawings/Specifications attached:		**Yes**		
Typical infrastructure: Minor repair and refurbishment of existing LAB and proposed construction of integrated biomedical waste treatment and disposal microwave-based waste management's shelter with an area of (7m x 7m) within hospital premise (designated area)				
Proposed Environmental Category, after conducting screening checklist:		**A:**		
		B: 11		
		C: 16		
		Other:		

SCREENING QUESTIONS	Yes	No	REMARKS
A. PROJECT SITING IS THE PROJECT AREA:			
▪ Densely populated?		√	None of these densely populated
▪ Heavy development activities?		√	None of these heavy development activities
▪ Underground utilities?		√	No underground utilities
▪ Adjacent to/or within any environmentally sensitivity area?		√	None of environmentally sensitivity area
▪ Cultural heritage site?		√	No cultural heritage site
▪ Flooded area?	√		Stung Treng PRH has regular flooding by Mekong water going up every 5 or 10 years. The buildings need to elevate to safe of flooding
▪ Landmines/UXO?	√		The director of Snoul district RH has mentioned about the landmines/UXOs contaminated in the hospital campus- needs to land

SCREENING QUESTIONS	Yes	No	REMARKS
			mines/UXOs clearance before constructing the building
▪ Protected area?		√	None of protected area
▪ Wetlands?		√	None of wetlands
▪ Mangrove?		√	None of mangrove
▪ Estuarine?		√	None of estuarine
▪ Buffer zone of protected area?		√	No buffer zone of protected area?
▪ Special area for protecting biodiversity?		√	No special area for protecting biodiversity
▪ Bay?		√	None of Bay
B. POTENTIAL ENVIRONMENTAL IMPACTS WILL THE PROJECT CAUSE …			
▪ Dislocation or involuntary resettlement of people?		√	None
▪ Disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		√	None
▪ Impacts on the sustainability of associated sanitation and solid waste disposal systems and their interactions with other urban services?		√	None
▪ Deterioration of surrounding environmental conditions due to rapid urban population growth, commercial and industrial activities, and increased waste generation to the point that both manmade and natural systems are overloaded and the capacities to manage these systems are overwhelmed?		√	Away from populated areas
▪ Loss of downstream beneficial uses (water supply or fisheries)?	√		Potential impact of untreated wastewater from improvement works and laboratory operations, and medical solid waste washings to stream sources of water. Target district hospitals should mitigate by ensuring that they operate existing drainage and wastewater treatment
▪ Encroachment into precious ecosystem (e.g. sensitive habitats like protected forest areas or terrestrial wildlife habitats?		√	None of protected forest areas or terrestrial wildlife habitats.
▪ Occupation of low-lying lands, floodplains and steep hillsides by		√	Not anticipated

SCREENING QUESTIONS	Yes	No	REMARKS
informal settlers and low-income groups, and their exposure to increased health hazards and risks due to polluted industry?			
▪ Water resource problems (e.g. depletion/degradation of available water supply, deterioration for surface and ground water quality, and pollution of receiving waters?	√		Potential impact of untreated wastewater from improvement works and laboratory operations, and medical solid waste washings to boreholes/wells used as groundwater source. Target district hospitals should mitigate by ensuring that they operate existing drainage and wastewater treatment facilities
▪ Air pollution from fuel gas discharged into the atmosphere?		√	Not anticipated because it minor repair and construction of small shelter
▪ Noise and dust from construction activities?		√	Potential impacts from minor repair and improvement works in laboratories
▪ Traffic disturbances due to construction material transport and wastes?		√	Not anticipated because it minor repair and construction of small shelter
▪ Increased road traffic due to interference of construction activities?		√	Not anticipated because it minor repair and construction of small shelter
▪ Hazardous driving conditions where construction interferes with pre-existing roads?		√	Not anticipated
▪ Hazards to public health due to ambient, household and occupational pollution, thermal inversion, and smog formation?		√	Not anticipated
▪ Short-term construction impacts (e.g. soil erosion and silt runoff, deterioration of water and air quality, noise, dust and vibration from construction equipment?		√	Potential minor impacts from small shelter construction repair and improvement works of laboratories within existing hospital building facilities
▪ Overdrawing of ground water, leading to land subsidence, lowered ground water table, and salinization?	√		Not anticipated
▪ Contamination of surface and ground waters due to improper waste disposal? and waste water discharging from cesspool/pits	√		Potential impact for hospitals with deficient and substandard medical solid waste management systems especially if the hospital grounds are used as temporary waste transfer stations. Target district hospitals should mitigate by ensuring that an operational medical waste management system is in place including treatment facilities that comply with MOE emission standards.

SCREENING QUESTIONS	Yes	No	REMARKS
▪ Contamination of soil and groundwater from solid wastes from water treatment sludges, cafeteria or lunchroom wastes, ashes and incineration residues, etc.?		√	Not anticipated
▪ contamination of surface and ground waters due to improper waste disposal?			Potential impact for hospitals with deficient and substandard incinerators that produce emissions that are not compliant with air emission standards. Target district hospitals should mitigate by ensuring that an operational medical waste disposal system is in place that complies with MOE air emission standards.
▪ Health and safety hazards to workers from toxic gases and hazardous materials present in the facility?		√	Potential impact and mitigating measures as above in dealing with medical solid and liquid waste management
▪ Occupational and community health and safety risks?		√	Not anticipated
▪ Water pollution from discharge of liquid effluents		√	Potential impact and mitigating measures as above in dealing with medical solid and liquid waste management.
▪ Pollution of receiving waters resulting in amenity losses, fisheries and marine resource depletion, and health problems?		√	Not anticipated
▪ Public health and safety hazards due to solid waste disposal in sanitary landfills?		√	Potential impact by hospitals operating without medical solid waste treatment facilities. Mitigate by ensuring that a compliant disposal system is in place or is worked out with the municipality and no open dumping is allowed at the hospital grounds.
▪ Poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases from workers to local populations?		√	Not anticipated
▪ Increased noise and air pollution resulting from traffic volume?		√	Not anticipated
▪ Creation of temporary breeding habitats for mosquito vectors of disease?	√		Potential impact from hospitals that have deficient and substandard drainage facilities. Mitigating measure is to upgrade, maintain and ensure that no ponding from drainage systems occurs.

Annex-1: Environmental Monitoring Checklist by contractors/subcontractors:

General information	Date:……	
	Checklist prepared by:	
	Name of subprogram/output and location of construction site	
	Name of awarded contractor/subcontractor (if any)	
Permits, agreements	Request for obtaining a campsite during construction operations (if any), renting house is N/A	☐ Yes ☐ No ☐ N/A
	Request for obtaining an agreement for disposal of construction waste (if any)	☐ Yes ☐ No ☐ N/A
Management of construction sites	Proper location of construction site/camp	☐ Yes ☐ No ☐ N/A
	Equipment/plants properly licensed and approved by Ministry of the Environment (MOE)	☐ Yes ☐ No ☐ N/A
	Availability of proper storage for fuel, oil and construction materials	☐ Yes ☐ No ☐ N/A
	Proper maintenance of construction machinery and equipment (prevent leakage of fuel, oil, lubricants, etc.)	☐ Yes ☐ No ☐ N/A
	Use reasonable trucks for transportation of construction materials and waste with tarpaulin or similar materials covering	☐ Yes ☐ No ☐ N/A
	Clean the surrounding area from dust by water sprinkling in construction zone (when necessary)	☐ Yes ☐ No ☐ N/A
	Clean/wash tires of vehicles before they get to dwellings and/or drive on roads (when necessary)	☐ Yes ☐ No ☐ N/A
	Implementation of works at the established time (e.g. work during daytime 06.00 to 18.00)	☐ Yes ☐ No ☐ N/A
	Installation of necessary construction signs in construction sites, i.e. Safety First…	☐ Yes ☐ No ☐ N/A
	Ensure proper sanitary/ hygienic conditions for workers at the construction site/use the existing in campus?	☐ Yes ☐ No ☐ N/A
Community, Health and Safety	Provision of first-aid facilities for the workers and staff	☐ Yes ☐ No ☐ N/A
	Provision of personal protective equipment (PPE) (i.e. gloves, proper shoes, face mask, goggles) to staff and workers, as necessary.	☐ Yes ☐ No ☐ N/A
	Workers need to be aware of the following general rules: (i) no alcohol/drugs on-site; (ii) prevent excessive noise; (iii) no illegal activities such as, but not limited to gambling, and hunting farm animals in the area; (iv) trespassing on private/ commercial properties adjoining the site is forbidden; (v) no littering in the hospitals;	☐ Yes ☐ No ☐ N/A
Ready	Restoration of the area of construction sites and camps	☐ Yes ☐ No ☐ N/A

construction site	when the building construction works are completed	
	Replanting/planting of finished work areas (cut one tree replanting two trees)	☐ Yes ☐ No ☐ N/A
Employment (Unskilled labor)	Equal pay for equal works,	☐ Yes ☐ No ☐ N/A
	At least 30% of unskilled worker has to be employed as women.	☐ Yes ☐ No ☐ N/A
	No child labor?	☐ Yes ☐ No ☐ N/A
COVID-19 prevention	*In addition to PPE, the provision to staff and worker: Face mask, Sanitized alcohol, jelly and other*	☐ Yes ☐ No ☐ N/A
Notice ៖		

Annex-2: List of persons met and discussions:

លរ No	ឈ្មោះ Name	ស្ថាប័ន Hospital	ភេទ/ Sex	អាយុ Age	តួនាទី Occupation	លេខទូរស័ព្ទ Phone No.	ហត្ថលេខា Signature
1	Dr. HAK Samoeurn	Kaoh Thom	M	59	Director	012 981672	
2	Dr. BUN Leng	Kaoh Thom	M	65	District councilor	012 965311	
3	Dr. SAN Ny	Kaoh Thom	M	52	IPC focal point	012 981672	
4	Dr. MUY Vatanak	Kaoh Thom	M	32	IPC focal point	012 219424	
5	Dr. MY Leanghy	Kaoh Thom	M	33	IPC focal point	078879579	
6	Dr. LAL Teach	Kaoh Thom	M	52	LAB Teacher.	012 790311	
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លរ No	ឈ្មោះ Name	ស្ថាប័ន Hospital	ភេទ/ Sex	អាយុ Age	តួនាទី Occupation	លេខទូរស័ព្ទ Phone No.	ហត្ថលេខា Signature
1	Dr. MEN Chantha	Angkor Chey	M		Deputy Director	012 721079	
2	Dr. MON Cheatha	Angkor Chey	M		IPC focal point		
3	Med. NEAK Sophors	Angkor Chey	M	27	Staff	098596911	
4	Ms. EORM Sokhom	Angkor Chey	F	33	GxO	077577071	
5	UK Poleak	Angkor Chey	M	31	OPD	0963735175	
6	NOP Nararasmey	Angkor Chey	M	27	Dentist	089228854	
7	NGETH Ratha	Angkor Chey	M	45	LAB	089991381	
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លរ No	ឈ្មោះ Name	ស្ថាប័ន Hospital	ភេទ/ Sex	អាយុ Age	តួនាទី Occupation	លេខទូរស័ព្ទ Phone No.	ហត្ថលេខា Signature
1	Dr. CHHOAM Sarom	Kg Trach	M	47	Deputy Director	012990440	
2	MENG Leang	Kg Trach	M	41	Cleaner	011778622	
3	EK Dynakin	Kg Trach	M	32	Staff	081 584480	
4	NOP Kalyan	Kg Trach	F	30	Staff	077576326	
5	KHEM Sangha	Kg Trach	M	29	Volunteer	0907 3040802	
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លរ No	ឈ្មោះ Name	ស្ថាប័ន Hospital	ភេទ/ Sex	អាយុ Age	តួនាទី Occupation	លេខទូរស័ព្ទ Phone No.	ហត្ថលេខា Signature
1	HING Loas	Chhuk	F	50	Staff	0974640755	
2	Dr. Toang Rataro	Chhuk	M		Director	096788857	
3	BRANG Sam Ang	Chhuk	M	51	Chief office	0979025858	
4	Hun Vanny	Chhuk	M	29	Staff	0979990607	
5	LONG Simpheakdey	Chhuk	M	36	Staff	092 337947	
6	KIM Lychheng	Chhuk	M	32	Staff	089296868	
7	HIN Marany	Chhuk	M	27	Rachha NGO	0889395912	
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លរ No	ឈ្មោះ Name	ស្ថាប័ន Hospital	ភេទ/ Sex	អាយុ Age	តួនាទី Occupation	លេខទូរស័ព្ទ Phone No.	ហត្ថលេខា Signature
1	Dr. CHHUY Chhong	Kampot	M	49	Director	015959888	
2	Dr. NEK Saroeun	Kampot	M	51	Deputy Director	077925541	
3	Ms. CHHIV Chenda	Kampot	F	39	Admin vice chief	015422370	
4	MOT Chanbopha	Kampot	F	33	Vice section	012725536	
5	TIV Sao	Kampot	M	25	Staff	086428022	
6	OU Kunthy	Kampot	F	50	Staff	096555919?	
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លរ No	ឈ្មោះ Name	ស្ថាប័ន Hospital	ភេទ/ Sex	អាយុ Age	តួនាទី Occupation	លេខទូរស័ព្ទ Phone No.	ហត្ថលេខា Signature
1	Dr. Mey Sarith	Pea Reang	M	45	Director	0977778850	
2	YON Mary	Pea Reang	M	49	Staff	012653506	
3	Dr. HENG Kimhour	Pea Reang	M	49	Section chief OPD	0972288896	
4	YA Theara	Pea Reang	M	30	Admin staff	095334470	
5	KHUN Sochenda	Pea Reang	F	33	Admin staff	098576997	
6	OUN Noch	Pea Reang	M	24	LAB staff	010459105	
7	LY Panha	Pea Reang	F	31	Chief of GO	017599002	
8	Roeun Pisey	Pea Reang	F	31	Admin staff	092878977	
9	SUM Sokhen	Pea Reang	M	32	PMRS	0764000027	
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1	HIM Kan	Prey Veng	M		Director		
2	LENG Peany	Prey Veng	M		Deputy Director	012955949	
3	CHHEANG Vanna	Prey Veng	M		Deputy Director	012605592	
4	SAN Kim Hong	Prey Veng	M		Deputy Director		
5	LY Bun Thoeun	Prey Veng	M		Deputy Director		
6	UNG Sereivouth	Prey Veng	M		LAB chief	010303164	
7	SOK LintaChanthy	Prey Veng	F		LAB vice chief	012996891	
8	KHEM Sereirath	Prey Veng	F		LAB staff	0975289672	
9	Srey Sengkalika	Prey Veng	F		LAB staff	093804795	
10	ORN Sann	Prey Veng	F		LAB staff	012879437	
11	SREY Tha	Prey Veng	M		LAB staff	012335310	
12	KONG Vichaka	Prey Veng	M		OPD	012 949389	
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1	YU Sina	Preah Sdach	M	45	Director	016977728	
2	HAS Chamroeun	Preah Sdach	M	33	Deputy Director	012637385	
3	HOR Vuthy	Preah Sdach	M	49	Chief of PPC	096242449	
4	SOK Kuntech	Preah Sdach	M	30	Chief of LAB	015892632	
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លរ No	ឈ្មោះ Name	ស្ថាប័ន Hospital	ភេទ/ Sex	អាយុ Age	តួនាទី Occupation	លេខទូរស័ព្ទ Phone No.	ហត្ថលេខា Signature
1	KONG Panha	Kg Trabaek	M	34	Deputy Director	090888880	
2	CHHOUN Chhun	Kg Trabaek	M	47	Deputy Director	012456713	
3	UNG Vorchkeang	Kg Trabaek	F	27	Mid wife	0962897722	
4	CHORN Sreyno	Kg Trabaek	F	27	Nurse	070444763	
5	SOT Malis	Kg Trabaek	F	22	Nurse	010765562	
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1	Dr. CHAN Dara	Svay Rieng	M	47	Director	012953975	
2	THONG Umsodara	Svay Rieng	M	38	Deputy Director	0884777715	
3	SO Vannarimy	Svay Rieng	F	48	DMGE EAF	011350607	
4	SOUS Ratheung	Svay Rieng	F	51	Chief of BLDNG	012 769827	
5	EM Yutharith	Svay Rieng	M	57	Chief of	071 3013311	
6	HOK Tichun	Svay Rieng	M	59	Room chief	0975091233	
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1	SIN Arng	OD Bavet	M	54	Chief of accounting	017788856	
2	NGEN Sokpheakdey	Chiphou	M	31	Chief IPC	016719898	
3	OUCH Sitha	OD Bavet	M	53	Chief of prevention	09775429798	
4	NGOUN Kong	OD Bavet	M	32	Accountant	0882530556	
5	PRAK Sambath	Chiphou	M	47	Director	012761089	
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លរ No	ឈ្មោះ Name	ស្ថាប័ន Hospital	ភេទ/ Sex	អាយុ Age	តួនាទី Occupation	លេខទូរស័ព្ទ Phone No.	ហត្ថលេខា Signature
1	HONG Kosal	Ponhea Krek	F	46	Deputy Director	012794417	
2	VUTHI Sophanith	Ponhea Krek	M	28	Section chief	0316665567	
3	PATH Kimhour	Ponhea Krek	M	26	LAB staff	010770106	
4	HOUT Hokrith	Ponhea Krek	M	30	LAB staff	08855555370	
5	SOK Chiva	Ponhea Krek	M	32	LAB staff	0885588656	
6	CHEA Seila	Ponhea Krek	M	26	Admin	086766682	
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1	CHHEM Narith	Memot	M		Director	012873127	
2	HOK Polin	Memot	M		Deputy Director	089905550	
3	MAO Bunrith	Memot	M		Admin	099333078	
4	HENG Lykheang	Memot	F		Staff	012227449	
5	LY Thavy	Memot	F		Section chief	012711144	
6	OU Soky	Memot	F		Staff	0976834125	
7	SIM Sokpheap	Memot	F		Staff	0886203377	
8	KEO Sokphon	Memot	M		Staff	0889344483	
9	PROM Sokheng	Memot	M		Staff	096 3305074	
10	SOKVAN Vireak	Memot	M		Staff	077464606	
11	YONG Sokthea	Memot	M		Chief of dentist	0979938241	
12	TRY Syna	Memot	M		Staff	0963631962	
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1	RATH Putheanea	Tboung Khmum	M	55	Director	012376347	
2	HOK Nak	Tboung Khmum	M		Deputy director	011862039	
3	THAY Ravy	Tboung Khmum	F		Chief of PPC	012363531	
4	HENG Chansotheavy	Tboung Khmum	F	32	Staff	012939194	
5	LENG Bunchhoeun	Tboung Khmum	M	29	Staff	011543470	
6	MA Sokphearun	Tboung Khmum	F	53	Staff	012294855	
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លរ No	ឈ្មោះ Name	ស្ថាប័ន Hospital	ភេទ/ Sex	អាយុ Age	តួនាទី Occupation	លេខទូរស័ព្ទ Phone No.	ហត្ថលេខា Signature
1	HENG Sokhan	Kratie	M	50	Director	012881880	
2	YEAV Chanly	Kratie	F	55	Dep director	012804565	
3	CHHOM Chanvisotharin	Kratie	M	46	Deputy Director	012 954850	
4	HAV Lor	Kratie	M	47	Chief ward	012881880	
5	NHEH Sreytouch	Kratie	F	34	LAB	092284413	
6	MAO Sodaly	Kratie	F	27	LAB	0978922097	
7	KEANG An	Kratie	M	46	ER	012855859	
8	SROEU Sokhoeun	Kratie	M	46	Bo	011759857	
9	LY THavouth	Kratie	M	36	Chief ward	077696867	
10	MEAN Phally	Kratie	F	55	Chief ward	011258579	
11	TEK Monykunthea	Kratie	M	49	Chief war PT	012852858	
12	SOENG Samnavy	Kratie	M	49	chief	011905207	
13	NEY Vanara	Kratie	M	52	Chief MD	012949533	
14	SUN La	Kratie	M	53	Chief admin	012943847	

លរ No	ឈ្មោះ Name	ស្ថាប័ន Hospital	ភេទ/ Sex	អាយុ Age	តួនាទី Occupation	លេខទូរស័ព្ទ Phone No.	ហត្ថលេខា Signature
1	ORNG Vanara	Snoul	M	50	Director	0978008555	
2	PICH Choranay	Snoul	M	45	Depu Director	085499933	
3	YON Dyla	Snoul	M	45	Staff	0976533535	
4	THEAM Phanith	Snoul	M	46	Admin	0886234447	
5	KEO Pitou	Snoul	M		LAB	0978077791	
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លរ No	ឈ្មោះ Name	ស្ថាប័ន Hospital	ភេទ/ Sex	អាយុ Age	តួនាទី Occupation	លេខទូរស័ព្ទ Phone No.	ហត្ថលេខា Signature
1	Dr. TUY Srors	Mondulkiri	M		Director	061687070	
2	Dr. MOK Chendarith	Mondulkiri	M		Depu Director	012940311	
3	THAY Chenda	Mondulkiri	M		Chief of Re'A	012440866	
4	SOM Sony	Mondulkiri	F		Staff	0975185845	
5	RIN Sytha	Mondulkiri	F		Chief ward	012807925	
6	CHHOENG Chhunlat	Mondulkiri	F		Staff	0715391919	
7	SRENG Synath	Mondulkiri	F		Staff	016923916	
8	Krain Thon	Mondulkiri	M		Chief ward	012259203	
9	CHHAY Kakada	Mondulkiri	M		Chief of LAB	0317799824	
10	SONG Dany	Mondulkiri	F		Staff	0888413500	
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1	Dr. HINGPHAN Sarsothea	Ratanakiri	M		Director	012528008	
2	LAT Sophana	Ratanakiri	M		Depu Director	012404132	
3	NOP Taing-oun	Ratanakiri	M		Chief of adm	012773946	
4	KOH Potou	Ratanakiri	M		Depu Director	012858085	
5	PICH Hassoaphoan	Ratanakiri	M		Staff	078457636	
6	KOEUN Tes	Ratanakiri	F		Staff	067263007	
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លរ No	ឈ្មោះ Name	ស្ថាប័ន Hospital	ភេទ/ Sex	អាយុ Age	តួនាទី Occupation	លេខទូរស័ព្ទ Phone No.	ហត្ថលេខា Signature
1	KHIEV Vichet	ST Treng	M		Depu Director	0978855228	
2	HOEU Sethel	ST Treng	M		Depu Director	077999468	
3	SOUS Kol	ST Treng	M	46	Chief of Tech	012314341	
4	SRUN Rithy	ST Treng	M	29	Chief of LAB	017373061	
5	KHIEV Vuthy	ST Treng	M		Chief of Adm	0978971020	
6	SIM Syrotha	ST Treng	M		Depu Director	092 799464	
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លរ No	ឈ្មោះ Name	ស្ថាប័ន Hospital	ភេទ/ Sex	អាយុ Age	តួនាទី Occupation	លេខទូរស័ព្ទ Phone No.	ហត្ថលេខា Signature
1	CHOU Polina	PreahVihear/	M	47	Depu Director	089899855	
2	SOPHA Chenda	PreahVihear 16 Makara	M	47	Chief of Sec	012699647	
3	SAE Meanthy	PreahVihear 16 Makara	M	31	Surgery	0882525727	
4	SO Sereivuth	PreahVihear 16 Makara	M	49	Chief ward	012 985755	
5	THONG Vatana	PreahVihear 16 Makara	M	46	Chief ward	017332596	
6	KANN Phirun	PreahVihear 16 Makara	M	34	Staff	061229779	
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លរ No	ឈ្មោះ Name	ស្ថាប័ន Hospital	ភេទ/ Sex	អាយុ Age	តួនាទី Occupation	លេខទូរស័ព្ទ Phone No.	ហត្ថលេខា Signature
1	YIN Hoang	BIBPRH	M	46	Chief of care	078262679	
2	EAM Thoeng	BIBPRH	M	48	Chief of admin	012269388	
3	CHHEM Chhaya	BIBPRH	M	39	Staff of mainte	011303449	
4	CHHOEUT Thea	BIBPRH	M	30	Electrical	070464638	
5	CHHUY Samith	BIBPRH	M	61	Electrical	098270645	
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លរ No	ឈ្មោះ Name	ស្ថាប័ន Hospital	ភេទ/ Sex	អាយុ Age	តួនាទី Occupation	លេខទូរស័ព្ទ Phone No.	ហត្ថលេខា Signature
1	TAENG Saroth	Pailin PRH	M	49	Director	0978789499	
2	SOUN Pheanith	Pailin PRH	M	33	Adm chief	0885599955	
3	KEAV Chaovy	Pailin PRH	F	45	Chief of Matern	078806446	
4	HOK Kanha	Pailin PRH	F	32	Vice chief Mat	010500413	
5	VAY Sareth	Pailin PRH	F	49	Staff		
6	PEN Chenda	Pailin PRH	M	38	Staff	092789478	
7	NIN Thearath	Pailin PRH	M	26	Staff	010248216	
8	HEN Yinhorn	Pailin PRH	M	27	Staff	086953498	
9	CHHOUN Many	Pailin PRH	F	25	Staff	010405791	
10	VORN Phaneth	Pailin PRH	M	26	Staff	069880393	
11	PHOEM Champip	Pailin PRH	M	31	Staff	098707794	
12	SO Sopheaktra	Pailin PRH	M	35	Staff	010705268	
13	OEUN Pich	Pailin PRH	M	37	Surgery	090975777	
14	LIM Phora	Pailin PRH	M	38	Staff	060975777	
15	KHUN Pheap	Pailin PRH	M	32	Staff	0973098700	
16	KOAM Ornn	Pailin PRH	F	30	Staff	086256767	
17	SOK Son	Pailin PRH	M	50	Staff	016375231	
18	KEAN Sengorn	Pailin PRH	M	50	Staff	0974166633	
19	NOV Vuthea	Pailin PRH	M	33	Staff	0315555695	
20	SOM Saroeun	Pailin PRH	M	41	Staff	090700344	
21	TOEUK Da	Pailin PRH	M	31	Staff	0979296608	
22	SOUNG Chung	Pailin PRH	M	35	Staff	012640752	
23	TUNG Thavy	Pailin PRH	F	33	Chief of Sec	016376116	
24	UL Bunphal	Pailin PRH	M	20	Chief ward	0888652776	
25	SAING Sinsokea	Pailin PRH	F	29	Staff	010771068	

លរ No	ឈ្មោះ Name	ស្ថាប័ន Hospital	ភេទ/ Sex	អាយុ Age	តួនាទី Occupation	លេខទូរស័ព្ទ Phone No.	ហត្ថលេខា Signature
1	CHAK Sam-oul	Sampao Lun	M	56	Director	012747467	
2	NHOR BAI Meach	Sampao Lun	M	46	Chief of Matern	012372118	
3	IN Sakhorn	Sampao Lun	M	47	Admin	099424270	
4	CHHOEUN Thy	Sampao Lun	M	60	Chief of admin	012501809	
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លរ No	ឈ្មោះ Name	ស្ថាប័ន Hospital	ភេទ/ Sex	អាយុ Age	តួនាទី Occupation	លេខទូរស័ព្ទ Phone No.	ហត្ថលេខា Signature
1	CHAMROEUN Sae	POIPET RH	M	51	Deputy Director	092911533	
2	DET Tina	POIPET RH	M	49	Deputy Director	085999917	
3	PANG Reth	POIPET RH	M	52	Admin	012228895	
4	SOUN Sokphal	POIPET RH	M	55		012667744	
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លរ No	ឈ្មោះ Name	ស្ថាប័ន Hospital	ភេទ/ Sex	អាយុ Age	តួនាទី Occupation	លេខទូរស័ព្ទ Phone No.	ហត្ថលេខា Signature
1	PICH Vireak	Thma Pouk	M	59	Deputy Director	078686568	
2	BET Sokphorn	Thma Pouk	M	60	Cleaner	0886729536	
3	CHHEANG Phae	Thma Pouk	F	60	Cleaner		
4	DOEM Sarin	Thma Pouk	M	51	Admin	012431684	
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លរ No	ឈ្មោះ Name	ស្ថាប័ន Hospital	ភេទ/ Sex	អាយុ Age	តួនាទី Occupation	លេខទូរស័ព្ទ Phone No.	ហត្ថលេខា Signature
1	CHAN Vidynavuth	MBR	M	56	Director	012666120	
2	NEANG Sokpheng	MBR	M	36	Chief of admin	012276000	
3	CHHUM Kosal	MBR	M	33	Vice chief IPC	078602526	
4	OU Sam Arth	MBR	M	68	Ass admin	078297707	
5	TOUN Sophoatt	MBR	M	51	Accountant	089575053	
6	KEAT Mengkheang	MBR	M	51	Vice chief Tech	012838608	
7	CHHOEUM En	MBR	M	64	Electric WSup	012340156	
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លរ No	ឈ្មោះ Name	ស្ថាប័ន Hospital	ភេទ/ Sex	អាយុ Age	តួនាទី Occupation	លេខទូរស័ព្ទ Phone No.	ហត្ថលេខា Signature
1	REN Bora	Moung Ruessey	M	28	Mid wife	0977038248	
2	LEANG Kakvay	Moung Ruessey	M	58	Depu Director	012996540	
3	SO Meng	Moung Ruessey	M	53	Depu Director	092808107	
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Annex-3: Field reports

Assessor name	SAO Botumroath
Position/title	Safeguards Specialist
Date of travel	From: 3 to 7 June 2019
Transportation	Project vehicle
Destination and places of visited	Kratie: Kracheh PRH, and Snoul DRH Mondolkiri: Mondulkiri PRH Ratanakiri: Ratanakiri PRH Stung Treng: Stung Treng PRH Preah Vihear: 16 Makara PRH
Objectives of the trip	Safeguards assessments-Hospital social and environmental safeguards and IPC
(Accompanying) team member	Dr. Ou Vun , IPC Specialist
Summary mission	**1st day, 3 June 2019** **Kratie PRH- CPA-3**: - Consultants team has discussed with 14 hospital management and staff, included 4 is female and discussion with them, introduction about objectives of assessment - Discussing about social and environmental issues within hospital and its community surroundings. - The Indigenous peoples beneficial from the project also discussing about their access to health services in hospital, believes in their habits/traditions such praying and healing or curing. - Conducting social and environmental screening checklists, climate change risk assessment for designing Code of Conduct and/or Due Diligence Report for Environment/IPC. - Assessment hospital premise for social and environmental issues, and anticipated social and environment impacts, solid waste and/or medical waste collection and management and waste water and/or liquid wastes collection discharging, focusing mainly on laboratory and microwave/incinerator/CSIM designation within hospital campus and so forth. **2nd day, 4 June 2019** **Snoul RH- CPA-1:** - Brief discussion with 5 hospital management, all is male and discussion with those hospital management officers, introduction about objectives of assessment

	- Discussing about social and environmental issues within hospital and its community surroundings - Conducting social and environmental screening checklists, climate change risk assessment for updating an initial environmental examination (IEE) and Environmental Management Plan (EMP). - Indigenous peoples planning and beneficial from the project also discussing about their access to health services in hospital, believes in their habits/traditions such praying and healing or curing. - Assessment hospital premise for social and environmental issues, and anticipated social and environment impacts, solid waste and/or medical waste dumping within premise of hospital and waste water and/or liquid wastes collection discharging, focusing mainly on laboratory and microwave-based waste management /incinerator within hospital campus and so forth. **Mondulkiri PRH - CPA-2** - Met with 10 hospital management, 5 is female and discussion with those hospital management officers, introduction about objectives of assessment - The Indigenous peoples beneficial from the project also discussing about their access to health services in hospital, believes in their habits/traditions such praying and healing or curing. - Discussing about social and environmental issues within hospital and its community surroundings - Conducting social and environmental screening checklists, climate change risk assessment for updating an initial environmental examination (IEE) and Environmental Management Plan (EMP). - Assessment hospital premise for social and environmental issues, and anticipated social and environment impacts, solid waste and/or medical waste collection and management and waste water and/or liquid wastes collection discharging, focusing mainly on laboratory and microwave/incinerator/CSIM designation within hospital campus and so forth. **3rd day, 5 June 2019** **Ratanakiri PRH- CPA-3** - Gathering of 6 management staff in hospital included one female and introduction about objectives of assessment - Discussing about social and environmental issues within hospital and its community surroundings - Conducting social and environmental screening checklists, climate change risk assessment for designing Code of Conduct and/or Due Diligence Report for Environment/IPC.

	- The Indigenous peoples beneficial from the project also discussing about their access to health services in hospital, believes in their habits/traditions such praying and healing or curing. - Assessment hospital premise for social and environmental issues, and anticipated social and environment impacts, solid waste and/or medical waste collection and management and waste water and/or liquid wastes collection discharging, focusing mainly on laboratory and microwave/incinerator/CSIM designation within hospital campus and so forth. **Stung Treng PRH- CPA-3** - Met with 5 management team, all is male and discussion with those hospital management officers, introduction about objectives of assessment - Discussing about social and environmental issues within hospital and its community surroundings. - Indigenous peoples planning and beneficial from the project also discussing about their access to health services in hospital, believes in their habits/traditions such praying and healing or curing. - Conducting social and environmental screening checklists, climate change risk assessment for updating an initial environmental examination (IEE) and Environmental Management Plan (EMP) - Assessment hospital premise for social and environmental issues, and anticipated social and environment impacts, solid waste and/or medical waste collection and management and waste water and/or liquid wastes collection discharging, focusing mainly on laboratory and microwave/incinerator/CSIM designation within hospital campus and so forth. **4th day, 6 June 2019** **16 Makara PRH- Preah Vihear- CPA-3** - Met with 6 management officer in hospital, all are males and discussion with them introduction about objectives of assessment. - Indigenous peoples are coming to hospital and accessing to health services in hospital, believes in their habits/traditions such praying and healing or curing. - Discussing about social and environmental issues within hospital and its community surroundings - Conducting social and environmental screening checklists, climate change risk assessment for designing Code of Conduct and/or Due Diligence Report for Environment/IPC. - Assessment hospital premise for social and environmental issues, and anticipated social and environment impacts, solid waste and/or medical waste collection and management and

	waste water and/or liquid wastes collection discharging, focusing mainly on laboratory and microwave/incinerator/CSIM designation within hospital campus and so forth.
Recommendations **Follow up actions**	- In relation with indigenous peoples plan, strengthening their access to health services, harmonizing their believe and traditions. - Separation of general solid waste and medical waste, to be aware of these issue to people in hospital during their stay and visiting: - General solid waste collection and management (temporary storage, avoid odor and so forth) - Medical waste collection and management (storage, burning down and so for). - Liquid waste discharging and collection- mainly from laboratory and other medical rooms - Esthetic, harmonization of hospital compound/court- environmental friendly to patients and people during their stay <u>Compliance and enforcement of MOH guidelines for solid waste/medical waste management, and MOHs' National Medical Laboratory Biosafety Guidelines for waste water and liquid discharge.</u>

Assessor name	SAO Botumroath
Position/title	Safeguards Specialist
Date of travel	From: 10 to 14 June 2019
Transportation	Project vehicle
Destination and places of visited	Battambang: Moung Ruessey RH, Battambang PRH and Sampao Lun RH Pailin: Pailin PRH Banteay Mean Chey: Poipet RH, Thma Pouk RH and CJFH BMC PRH
Objectives of the trip	Safeguards assessments-Hospital social and environmental safeguards and IPC
(Accompanying) team member	Dr. Ou Vun , IPC Specialist
Summary mission	1st day, 10 June 2019 Moung Ruessey RH- **CPA-2**: - Consultant team has discussed with 3 hospital management team and staff, none are female. The discussion mainly focuses on the densely of building within the hospital premise and people surrounding the campus of hospital, water supply connection and electricity availability for Integrate – Biomedical Wastes Treatment Machine -Microwave-based waste management, designated for shelter construction and laundry. - Discussing about social and environmental issues within hospital and its community surroundings. - Conducting social and environmental screening checklists, climate change risk assessment for updating an initial environmental examination (IEE) and Environmental Management Plan (EMP) - Assessment hospital premise for social and environmental issues, and anticipated social and environment impacts, solid waste and/or medical waste collection and management and waste water and/or liquid wastes collection discharging, focusing mainly on laboratory and microwave/incinerator/CSIM designation within hospital campus and so forth. 2nd day, 11 June 2019 Battambang PRH- **CPA-3**:

	- Brief discussion with 5 hospital management, all is male and discussion with those hospital management officers, introduction about objectives of assessment. The discussion focuses on the smog from incinerator to people sounding the campus of hospital, water supply connection and electricity availabilities for Microwave-base waste management, designated for shelter of microwave- base and laundry. - Discussing about social and environmental issues within hospital and its community surroundings - Conducting social and environmental screening checklists, climate change risk assessment for designing Code of Conduct and/or Due Diligence Report for Environment/IPC - Assessment hospital premise for social and environmental issues, and anticipated social and environment impacts, solid waste and/or medical waste dumping within premise of hospital and waste water and/or liquid wastes collection discharging, focusing mainly on laboratory and microwave-base waste management /incinerator within hospital campus and so forth. Sampao Lun RH- **CPA-2**: - Met with 4 hospital management, none of female and discussion with those hospital management officers, introduction about objectives of assessment - Discussing about social and environmental issues within hospital and its community surroundings - Conducting social and environmental screening checklists, climate change risk assessment for updating an initial environmental examination (IEE) and Environmental Management Plan (EMP) - Assessment hospital premise for social and environmental issues, and anticipated social and environment impacts, solid waste and/or medical waste collection and management and waste water and/or liquid wastes collection discharging, focusing mainly on laboratory and microwave/incinerator/CSIM designation within hospital campus and so forth. 3rd day, 12 June 2019 Pailin PRH- **CPA-2** - Gathering of 25 hospital management and staff in hospital included 7 females and introduction about objectives of assessment - Discussing about social and environmental issues within hospital and its community surroundings - Conducting social and environmental screening checklists, climate change risk assessment for designing Code of Conduct and/or Due Diligence Report for Environment/IPC. Assessment hospital premise for social and environmental issues, and anticipated social and environment impacts, solid

	waste and/or medical waste collection and management and waste water and/or liquid wastes collection discharging, focusing mainly on laboratory and microwave/incinerator/CSIM designation within hospital campus and so forth. Poipet RH- **CPA-2**: - Met with 4 management team, all is male and discussion with those hospital management officers, introduction about objectives of assessment - Discussing about social and environmental issues within hospital and its community surroundings. - Conducting social and environmental screening checklists, climate change risk assessment for designing Code of Conduct and/or Due Diligence Report for Environment/IPC. - Assessment hospital premise for social and environmental issues, and anticipated social and environment impacts, solid waste and/or medical waste collection and management and waste water and/or liquid wastes collection discharging, focusing mainly on laboratory and microwave/incinerator/CSIM designation within hospital campus and so forth. 4th day, 13 June 2019 Thma Pouk RH- **CPA-2** - Met with 4 management officer in hospital, one is female and discussion with them introduction about objectives of assessment. - Discussing about social and environmental issues within hospital and its community surroundings, mainly about flooding within the hospital premise, solid waste management and segregation of waste. - Conducting social and environmental screening checklists, climate change risk assessment for updating an initial environmental examination (IEE) and Environmental Management Plan (EMP) - Assessment hospital premise for social and environmental issues, and anticipated social and environment impacts, solid waste and/or medical waste collection and management and waste water and/or liquid wastes collection discharging, focusing mainly on laboratory and microwave/incinerator/CSIM designation within hospital campus and so forth CJFH PRH- **CPA-3** - Met with 7 management officer in hospital, all are males and discussion with them about their good experiences, introduction about objectives of assessment.

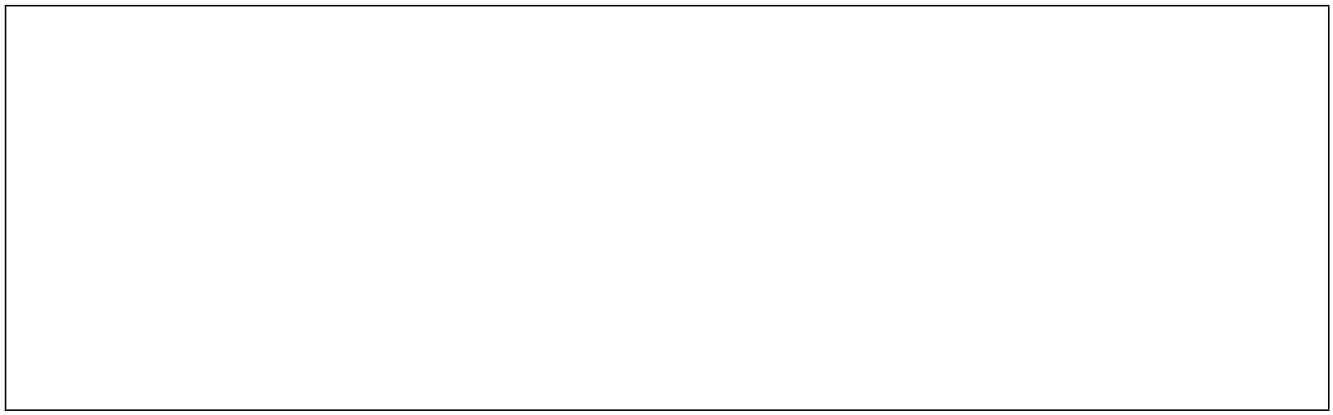
	- Discussing about social and environmental issues within hospital and its community surroundings - Conducting social and environmental screening checklists, climate change risk assessment for designing Code of Conduct and/or Due Diligence Report for Environment/IPC. - Assessment hospital premise for social and environmental issues, and anticipated social and environment impacts, solid waste and/or medical waste collection and management and waste water and/or liquid wastes collection discharging, focusing mainly on laboratory and microwave/incinerator/CSIM designation within hospital campus and so forth.
Recommendations **Follow up actions**	- Separation of general solid waste and medical waste, to be aware of these issue to people in hospital during their stay and visiting: - General solid waste collection and management (temporary storage, avoid odor and so forth) - Medical waste collection and management (storage, burning down and so forth). - Liquid waste discharging and collection- mainly from laboratory and other medical rooms - Esthetic, harmonization of hospital compound/court- environmental friendly to patients and people during their stay <u>Compliance and enforcement of MOH guidelines for solid waste/medical waste management, and MOHs' National Medical Laboratory Biosafety Guidelines for waste water and liquid discharge.</u>

Assessor name	SAO Botumroath
Position/title	Safeguards Specialist
Date of travel	From: 27 to 31 May 2019
Transportation	Project vehicle
Destination and places of visited	Prey Veng: Peareang, PRH Prey Veng, Peah Sdach, Kampong Trabaek Svay Rieng: PRH Svay Rieng, and RH Chipou Tboung Khmum: Ponhea Krek, Memot and Preah Sihanouk Krong Soung
Objectives of the trip	Safeguards assessments-Hospital social and environmental safeguards and IPC
(Accompanying) team member	Dr. Ou Vun , IPC Specialist
Summary mission	**1st day, 27 May 2019** **RH Pea Reang- CPA-2**: - Meeting with 9 hospital management and staff, included 3 is females and discussion with them, introduction about objectives of assessment - Discussing about social and environmental issues within hospital and its community surroundings - Conducting social and environmental screening checklists, climate change risk assessment for updating an initial environmental examination (IEE) and Environmental Management Plan (EMP) - Assessment hospital premise for social and environmental issues, and anticipated social and environment impacts, solid waste and/or medical waste collection and management and waste water and/or liquid wastes collection discharging, focusing mainly on laboratory and microwave/incinerator/CSIM designation within hospital campus and so forth. **PRH Prey Veng- CPA-3:** - Conducted debriefing with 12 hospital management/ 4 females and discussion with those hospital management officers, introduction about objectives of assessment - Discussing about social and environmental issues within hospital and its community surroundings - Conducting social and environmental screening checklists, climate change risk assessment for designing Code of Conduct and/or Due Diligence Report for Environment/IPC. - Assessment hospital premise for social and environmental issues, and anticipated social and environment impacts, solid waste and/or medical waste collection and management and

	waste water and/or liquid wastes collection discharging, focusing mainly on laboratory and microwave/incinerator/CSIM designation within hospital campus and so forth. **2nd day, 28 May 2019** **RH-Preah Sdach- CPA-1** - Met with 4 hospital management, all are males and discussion with those hospital management officers, introduction about objectives of assessment - Discussing about social and environmental issues within hospital and its community surroundings - Conducting social and environmental screening checklists, climate change risk assessment for designing Code of Conduct and/or Due Diligence Report for Environment/IPC - Assessment hospital premise for social and environmental issues, and anticipated social and environment impacts, solid waste and/or medical waste collection and management and waste water and/or liquid wastes collection discharging, focusing mainly on laboratory and microwave/incinerator/CSIM designation within hospital campus and so forth. **RH Kampong Trabaek- CPA-2** - Having Met with 5 management staff in hospital included 3 is females and introduction about objectives of assessment - Discussing about social and environmental issues within hospital and its community surroundings - Conducting social and environmental screening checklists, climate change risk assessment for designing Code of Conduct and/or Due Diligence Report for Environment/IPC. - Assessment hospital premise for social and environmental issues, and anticipated social and environment impacts, solid waste and/or medical waste collection and management and waste water and/or liquid wastes collection discharging, focusing mainly on laboratory and microwave/incinerator/CSIM designation within hospital campus and so forth. **3rd Day 29 May 2019** **PRH Svay Rieng- CPA-3** - Met with 6 management team included 2 females and discussion with those hospital management officers, introduction about objectives of assessment - Discussing about social and environmental issues within hospital and its community surroundings - Conducting social and environmental screening checklists, climate change risk assessment for designing Code of Conduct and/or Due Diligence Report for Environment/IPC.

	- Assessment hospital premise for social and environmental issues, and anticipated social and environment impacts, solid waste and/or medical waste collection and management and waste water and/or liquid wastes collection discharging, focusing mainly on laboratory and microwave/incinerator/CSIM designation within hospital campus and so forth. **RH Chipou- CPA-1** - Met with 5 management officer in hospital, all are males and discussion with them introduction about objectives of assessment - Discussing about social and environmental issues within hospital and its community surroundings - Conducting social and environmental screening checklists, climate change risk assessment for updating an initial environmental examination (IEE) and Environmental Management Plan (EMP) - Assessment hospital premise for social and environmental issues, and anticipated social and environment impacts, solid waste and/or medical waste collection and management and waste water and/or liquid wastes collection discharging, focusing mainly on laboratory and microwave/incinerator/CSIM designation within hospital campus and so forth. **4th Day 30 May 2019** **RH Ponhea Krek- CPA-2** - Having Met with 6 staff management in hospital, 2 is female and discussion with those hospital management officers, introduction about objectives of assessment - Discussing about social and environmental issues within hospital and its community surroundings - Conducting social and environmental screening checklists, climate change risk assessment for designing Code of Conduct and/or Due Diligence Report for Environment/IPC. - Assessment hospital premise for social and environmental issues, and anticipated social and environment impacts, solid waste and/or medical waste collection and management and waste water and/or liquid wastes collection discharging, focusing mainly on laboratory and microwave/incinerator/CSIM designation within hospital campus and so forth. **RH Memot- CPA-2** - Conducted the discussion with 12 hospital management team, 5 is female, introduction about objectives of assessment - Discussing about social and environmental issues within hospital and its community surroundings - Conducting social and environmental screening checklists, climate change risk assessment for designing Code of Conduct and/or Due Diligence Report for Environment/IPC.

	- Assessment hospital premise for social and environmental issues, and anticipated social and environment impacts, solid waste and/or medical waste collection and management and waste water and/or liquid wastes collection discharging, focusing mainly on laboratory and microwave/incinerator/CSIM designation within hospital campus and so forth. **5th Day 31 May 2019** **RH Preah Norodom Sihanouk Tboung Khmum- CPA-2** - The discussion with 6 hospital management officers, 3 is female introduction about objectives of assessment - Discussing about social and environmental issues within hospital and its community surroundings - Conducting social and environmental screening checklists, climate change risk assessment for designing Code of Conduct and/or Due Diligence Report for Environment/IPC. - Assessment hospital premise for social and environmental issues, and anticipated social and environment impacts, solid waste and/or medical waste collection and management and waste water and/or liquid wastes collection discharging, focusing mainly on laboratory and microwave/incinerator/CSIM designation within hospital campus and so forth.
Recommendations **Follow up actions**	- Separation of general solid waste and medical waste, to be aware of these issue to people in hospital during their stay and visiting: - General solid waste collection and management (temporary storage, avoid odor and so forth) - Medical waste collection and management (storage, burning down and so for). - Liquid waste discharging and collection- mainly from laboratory and other medical rooms - Esthetic, harmonization of hospital compound/court- environmental friendly to patients and people during their stay <u>Compliance and enforcement of MOH guidelines for solid waste/medical waste management, and MOHs' National Medical Laboratory Biosafety Guidelines for waste water and liquid discharge.</u>



Assessor name	SAO Botumroath
Position/title	Safeguards Specialist
Date of travel	From: 23 to 25 May 2019
Transportation	Project vehicle
Destination and places of visited	Kandal: District RH Koh Thom Kampot: Provincial RH Kampot, District RH Angkor Chey, RH Kampong Trach and RH Chhuk
Objectives of the trip	Safeguards assessments-Hospital social and environmental safeguards and IPC
(Accompanying) team member	Dr. Ou Vun , IPC Specialist
Summary mission	**1st day, 23 May 2019** **RH Koh Thom- CPA-2**: - The safeguards and IPC consultants have met with 6 hospital management officers, included one is female, introduction about objectives of assessment - Discussing about social and environmental issues within hospital and its community surroundings - Conducting social and environmental screening checklists, climate change risk assessment for designing Code of Conduct and/or Due Diligence Report for Environment/IPC. - Assessment hospital premise for social and environmental issues, and anticipated social and environment impacts, solid waste and/or medical waste collection and management and waste water and/or liquid wastes collection discharging, focusing mainly on laboratory and microwave/incinerator/CSIM designation within hospital campus and so forth. **RH Angkor Chey- CPA-2** - Having met with 7 hospital management officers, included one female by introducing about objectives of assessment - Discussing about social and environmental issues within hospital and its community surroundings - Conducting social and environmental screening checklists, climate change risk assessment for designing Code of Conduct and/or Due Diligence Report for Environment/IPC. - Assessment hospital premise for social and environmental issues, and anticipated social and environment impacts, solid waste and/or medical waste collection and management and waste water and/or liquid wastes collection discharging, focusing mainly on laboratory and

	microwave/incinerator/CSIM designation within hospital campus and so forth. **2nd day, 24 May 2019** - **PRH-Kampot CPA-3** - Conducted a discussion with 6 hospital management officers, included 3 is female and introduction about objectives of assessment - Discussing about social and environmental issues within hospital and its community surroundings - Conducting social and environmental screening checklists, climate change risk assessment for updating an initial environmental examination (IEE) and Environmental Management Plan (EMP) - Assessment hospital premise for social and environmental issues, and anticipated social and environment impacts, solid waste and/or medical waste collection and management and waste water and/or liquid wastes collection discharging, focusing mainly on laboratory and microwave/incinerator/CSIM designation within hospital campus and so forth. - **RH Kampong Trach- CPA-2** - The discussion has held with 5 hospital management officers, included one is female, introducing about objectives of assessment - Discussing about social and environmental issues within hospital and its community surroundings - Conducting social and environmental screening checklists, climate change risk assessment for updating an initial environmental examination (IEE) and Environmental Management Plan (EMP) - Assessment hospital premise for social and environmental issues, and anticipated social and environment impacts, solid waste and/or medical waste collection and management and waste water and/or liquid wastes collection discharging, focusing mainly on laboratory and microwave/incinerator/CSIM designation within hospital campus and so forth. **3rd Day 25 May 2019** **RH Chhuk- CPA-2** - Safeguards consultant and IPC consultant have met with 7 hospital management officers, included 2 is female introduction about objectives of assessment: - Discussing about social and environmental issues within hospital and its community surroundings - Conducting social and environmental screening checklists, climate change risk assessment for updating an initial

	environmental examination (IEE) and Environmental Management Plan (EMP) - Assessment hospital premise for social and environmental issues, and anticipated social and environment impacts, solid waste and/or medical waste collection and management and waste water and/or liquid wastes collection discharging, focusing mainly on laboratory and microwave/incinerator/CSIM designation within hospital campus and so forth.
Recommendations **Follow up actions**	- Separation of general solid waste and medical waste, to be aware of these issue to people in hospital during their stay and visiting: - General solid waste collection and management (temporary storage, avoid odor and so forth) - Medical waste collection and management (storage, burning down and so for). - Liquid waste discharging and collection- mainly from laboratory and other medical rooms - Esthetic, harmonization of hospital compound/court- environmental friendly to patients and people during their stay <u>Compliance and enforcement of MOH guidelines for solid waste/medical waste management, and MOHs' National Medical Laboratory Biosafety Guidelines for waste water and liquid discharges.</u>